The making of 'green' capitalism in Europe's marginal regions: renewable energy production as territory grabbing for accumulation

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The candidate confirms that the work submitted is his own and that appropriate credit has been given where reference has been made to the work of others.

Abstract

It is no mystery that we are living in times of multiple ecological crises. Not only are phenomena such as climate change, widespread pollution, biodiversity loss, and soil artificialisation threatening irreversibly the 'natural' world. They imperil human society too, for human society is part of nature.

Taking a historical materialist perspective, this thesis understands those crises as originating in capitalist social relations, which maximise the exploitation of both human labour and the ecosystems. By the same token, the thesis maintains that mainstream responses to the crises are fully framed within the capitalist paradigm of perpetual and privatised 'accumulation for accumulation's sake', only now legitimised through 'green' credentials. Building on theoretical and political approaches calling for the incorporation of an 'ecological' rationality within capitalist relations, these responses articulate faith in and commitment to the modernisation of productive cycles and governance systems, from which a more sustainable – 'green' – capitalist economy can apparently arise.

Differently, this thesis interprets such a 'green' turn as capitalism's adaptation and expansion in the context of the ecological crises, with the overarching purpose of furthering our understanding of these dynamics. More accurately, the thesis deploys and innovates a range of historical materialist categories to analyse the hitherto under-explored relationship between the 'green' as an accumulation opportunity and its leveraging as a legitimation framework.

Empirically, the thesis investigates the accumulation of surplus value in and around renewable energy generation at the level of production areas, the enclosure and transformative processes it triggers, the class and factional cleavages it entails, and the regulatory mechanisms and legitimation narratives to which it is associated. Methodologically, it combines a comprehensive theoretical elaboration with case studies of two generation systems, one in southern Italy focused on wind energy and a second in eastern Germany focused on agricultural biogas.

The thesis's main argument is that under capitalism, renewable energy generation expands accumulation frontiers over not yet or 'inefficiently' commodified spaces and natures. This

occurs through their privatisation and abstraction into *fictitious capital* –that is through their commodification and financialization. In contrast with marginalist approaches, this thesis reconciles the socially necessary labour time theory of value with political ecology. It rejects the assumption that privatised spaces and natures might 'innately' provide exchange value, maintaining conversely that they serve as a collateral to capture –by way of rent- surplus value produced in society at a different point in time and space.

Secondly, the thesis offers a definition of 'green' capitalism as a *hegemonic project in the making*. This is characterised by two interrelated dialectics: one tending to restructure the forces and relations of production; the other to re-build hegemonic narratives and apparatuses, around re-significations of the 'green' made compatible with sustained accumulation.

Thirdly, the thesis advances the category of *territory grabbing*, intended as a spatiotemporal process whereby a territory, or places within or of it, is abstracted from its stratified historical identity, reduced to exchange value, and transposed into the accumulation function of an investment scheme.

As a principal contribution, this thesis offers an elaborate and original framework, broadening the range of theoretical and analytical instruments needed to decipher contemporary capitalism and its 'green' variant, both conceptually and empirically. In continuing the historical materialist tradition, as the concluding chapter explains, that framework, and the empirical findings it has produced, are not merely intended to enrich specialised literature, but most importantly to strengthen scholar and activist debates and practices towards a social and environmental justice beyond the inequalities of capitalism.

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List of Acronyms

ABL	Arbeitsgemeinschaft bäuerliche Landwirtschaft -Working group for peasant agriculture
AFOLU	Action Standard. Agriculture, Forestry, and Other Land Use
AG	Aktiengesellschaft - Public Limited Company
ASOS	Spesa per Oneri di Sistema – Renewable Energy Levy
BDR	Bundesrepublik Deutschland - German Federal Republic
BP1,2	Biogas Project 1,2
BVVG	Bodenverwertungs- und -Verwaltung
CAP	Common Agricultural Policy
CASMEZ	Fund for The South
CBD	Convention of Biological Diversity
CICES	Common International Classification of Ecosystem Services
C-M-C	Commodity-Money-Commodity
CoS	Conference of Service
CREA	Consiglio per la Ricerca in Agricoltura e l'Analisi dell'Economia Agraria – Council for Research on Agriculture and Agriculture Economics
CVC	Global Value Chain
d.lgs	Decreto Legislativo - Legislative Decree
DBV	Deutscher Bauernverband - German Farmers' Association
DDR	Deutsche Demokratische Republik - German Democratic Republic
DE	Deutschland - Germany
DENA	Deutsche Energie-Agentur - Germany Energy Agency
DESTASIS	Statistisches Bundesamt - Federal Statistical Office of Germany
EAP	Environmental Action Programme
EC	European Commission
ECJ	European Court of Justice
EEA	European Environment Agency
EEC	Economic European Community
EEG	Erneuerbare-Energien-Gesetz - Renewable Energy Sources Act
EIA	Environmental Impact Assessment
ENEL	Ente Nazionale Energia Elettrica - National Body for Electric Energy - National Body for Electric Energy
EPCC	Engineering, Procurement, Construction and Commissioning
EREC	European Renewable Energy Council
EREF	European Renewable Energy Federation
ESCO	Energy Service Company
ESPC	Energy Service Provider Companies
EU ETS	Emission Trading System of the European Union
EURO-STAT	European Statistical Office
EWEC	European Wind Energy Conference
FIP	Feed In Premium
FIT	Feed In Tariff
GCC	Global Commodity Chain

GEI	Green Economy Initiative
GHG	Green House Gases
GSE	Gestore Rete Elettrica - Grid Authority
IFAD	International Fund for Agricultural Development
ILUC	Indirect Land use Change
IPVC	Italian Vento Power Corporation
IRENA	International Renewable Energy Agency
ISTAT	Italian National Institute of Statistics i
IT	Italy
KTBL	Kuratorium für Technik und Bauwesen in der Landwirtschaft e. V.e
LPG	Landwirtschaftliche Produktionsgenossenschaften - Agricultural Production Cooperative
MA	Millennium Ecosystem Assessment
M-C-M	Money-Commodity-Money
MES	Markets for Environmental Services
M-M^{I}	Money-Money^{I}
MP	Member of Parliament
NAWARO	NachWachsenden Rohstoffen -Organic raw materials from Agricultural and Forestry
NEP	National Energy Plan
NES	National Energy Strategy
NGO	Non-Governmental Organisation
NIMBY	Not in My Back Yard
OAPEC	Organisation of Arab Petroleum Exporting Countries
PES	Payments for Ecosystem Services
PPA	Power Purchase Agreement
RAT	Regional Administrative Tribunal
RED	Renewable Energy Directive
REDD+	Reducing emissions from deforestation and forest degradation
RPEE	Regional Plan for Energy and the Environment
RTP	Regional Territorial Plan
SA	Single Authorisation
SEA	Single European Act
SEEA	System of Environmental Economic Accounting
SME	Small and Medium Enterprises
SNA	System of National Accounts
SPV	Special Purpose Vehicle
StrEG	Stromeinspeisungsgesetz - Electricity Feed Act
SVIMEZ	Society for the development of the South
TEEB	The Economics of Ecosystem and Biodiversity
TFGCs	Theories for the greening of capitalism
TGC	Tradable Green Certificate
UNFCC	United Nations Framework Convention on Climate Change
VCS	Verra's Verified Carbon Standard
VEB	Volkseigener Betrieb - State Owned Enterprise
VEG	Volkseigenes Gut - State-owned farm
WP1, 2	Wind Project 1,2

Preface

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Chapter 1 – Introduction

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1.1 A preamble: the ecological crises and the greening of capitalism

This research was conducted and written at the end of the 2011-2020 decade, the warmest on record. 2020 was the worst year so far, with an average temperature 1.2 (± 0.1) °C higher than between 1850-1900, considered by the World Meteorological Organisation as a preindustrial benchmark. Intense droughts, storms, heat waves, disappearing glaciers, melting polar ices, and rising sea levels are all effects of a climate crisis which has just begun to show its daunting face. Every year that passes, it knocks on the doors of our cities more insistently -with floods, huge wildfires and a whole arsenal of extreme events whose dynamics and intensity are predicted with improving precision. The climate crisis is real, is here to stay and is not alone. It comes with a capillary pollution and widespread ecological disturbances, provoked by all the contaminants and materials that the current mode of production has simply dumped into the ecosystem, a biodiversity loss accelerating at vertiginous rates and an equally fast and concerning soil artificialisation. What we are

witnessing is actually the unfolding of multiple ecological crises at the global scale. Not only are they threatening the 'natural' world -they imperil human society too, for human society is part of nature.

Climate change is but the most concerning and overarching of their interrelated dynamics. Its scenarios will vary greatly depending on whether the governments of the Global North, China, India and Russia will act timely and effectively to keep temperatures between 1.5 and 2 °C above the preindustrial benchmark or let them rise above 2 °C.

The multiple ecological crises do not affect everyone with the same intensity, a truth hard to deny. Social inequalities are already exacerbating their effects and in turn being exacerbated by them. For instance, with warmer temperatures the habitats of diseases like malaria, dengue fever, chikungunya and West Nile virus are expected to stably change and broaden. Worsened morbidity rates will hit the poorest harder, as they already do, and those without access to good hygiene, sanitation and health care. And it will increase mortality rates amongst them. A destroyed climate is also changing the patterns of rainfall, heat and cold. As a result, in the next decades, the productive capacity of continental food systems, like the sub-Saharans, will be seriously endangered, with the concrete risk of food security and sovereignty being disintegrated for hundreds of millions. Whole populations will be able to defend their right to a safe and comfortable life only by migrating. In short, the ecological crises are and will be social and political crises.

Where do these crises come from? Mass deforestations since the 16th century, intensive burning of fossil fuels since the 18th century and ecosystem contaminations throughout are epiphenomena of much deeper socioecological dynamics. The current fashion is to view these dynamics through the concept of *Anthropocene*, proposed by Crutzen and Stoermer (2000). Basing on the detectable atmospheric, geologic, hydrologic and biosphere permanent alterations unquestionably attributable to human activity since the industrial revolutions, the two scientists argue that the current period is a new geological era, that of the *Anthropos*. The concept has fast crossed the border of academic debate, gaining notoriety to the wider public, thanks to its efficacy in describing the impact and magnitude of human-made alterations.

Yet, the category poses substantial problems to social sciences. By indicating the *Anthropos* as responsible for the ecological multiple crises it naturalises and depoliticizes unevenly distributed responsibilities along class, race and gender cleavages.

This thesis takes a different stance. Its underlying theoretical framework holds that the ecological crises are not to be blamed on humans *in the abstract*, who would unleash them because of their myopic and improvident *nature*. Following a historical-materialist approach, the thesis maintains that the crises originate from the social relations inherent in capitalism, which maximises the exploitation of both human labour and ecosystems in order to sustain 'accumulation for accumulation's sake and production for production's sake' (Marx, 1976). From this standpoint, the ecological crises are historically and geographically rooted within class, race, and gender privilege. They are the poisoned gift of a mode of production -capitalism- that has increased social wealth to a level hitherto unknown in human history. By reinvesting and incessantly revolutionising its own productive and organisational capacity, capitalism has appropriated and converted ever greater matter and energy, including human labour, into enormous quantities of commodities. And yet, this has come with huge social and ecological costs. On the one hand, uncontrollable quantities of entropic matter such as Green House Gases (GHGs) and pollutants (Georgescu-Roegen, 1971) have been dispersed along capitalism's historical geography. On the other, accumulation has been sustained through forcible appropriations of land and ecosystem resources leaving hundreds of millions deprived from their material conditions of subsistence and transforming them into wage-labourers, 'free' to sell the sole commodity they own, labour power, to those who control the means of production, capitalists (Marx, 1976; Wallerstein, 2004a; Moore, 2015). The exploitation of wage-labour is not the only and -to some extent- the worst of human labour appropriations by capital, as it has been constantly intertwined with slavery and other forms of forced and unpaid labour, included women's domestic work. The division of labour amongst classes has come to mirror a division of labour amongst regions and countries of the world, evolved from colonialism and imperialism to neo-colonial and postcolonial unequal exchange and dependency (Wallerstein, 2004; Moore, 2015).

Aligned to a similar line of reasoning, Donna Haraway (2017) and Jason Moore (2015), although through distinct paths, come equally to conclude that academic and political

debates around the Anthropocene may fail to acknowledge the historical and social foundation of the ecological crises, and hence propose to rather term the current era as that of capital -or the *Capitalocene*.

In reality, the category of *Anthropocene*, especially its mainstream understandings, is only the latest outcome of a long-lasting theoretical tradition abstracting capitalism-induced crises from the concreteness of the social relations wherein they originate, beginning with Thomas Malthus (1827) and his theory of overpopulation. Not only does this process of abstraction involve the causes of the crises, but it also concerns the devising and implementation of the solutions to them. As this thesis will illustrate, conceptual frameworks such as *ecological modernisation*, *natural capital*, and *ecosystem accounting* have isolated the *ecological rationality* from other 'rationalities' for social change (see chapter 2 and Dryzek, 1983; Beck, 1992a; Spaargaren and Mol, 1992). They have made it compatible and in fact functional to capitalist social relation, transforming the ecological crises into a new 'green' accumulation horizon through which to extract surplus value and strengthen class hegemony, including the legitimising narratives. By the same token, international and national environmental policies have been framed as a technical field subordinated to economic strategies and directed to boosting a 'green' growth', creating a 'green' economy and ultimately making a 'green' capitalism. In this context, the production of energy from renewable energy sources, as a major environmental policy ambit, has been organised in accordance with a 'free' market ideology, entrusting it to private investment. This has implied the privatisation of the ecosystem spaces, stocks and flows to be converted into renewable energy sources, the subsidisation of private accumulation through public money and its legitimation under 'green' credentials, and ultimately the advancing of the capitalist frontier over not yet commodified or 'inefficiently' commodified spaces and natures (Fairhead et al., 2012; Ekers and Prudham, 2017).

Although a correlation between the ecological crises and capitalism as a mode of production and system of governance might seem an obvious fact to argue, especially to an historical materialist or critical observer, its implications are legion and remain hitherto under-investigated to a large extent. It forms indeed an analytical interstice within the historical materialist debate to which this thesis is intended to contribute. More accurately, towards the overarching purpose of furthering our understanding about the making of a

'green' capitalism, as it happens through space and time, the thesis combines an original theoretical elaboration with case studies of two renewable energy generation systems: wind energy and agricultural biogas. These are located respectively in southern Italy and eastern Germany, which are two marginal regions within a centre of the global division of labour, the EU.

After completing the preamble in the following subsection by discussing the construction of the 'green' as a policy field and accumulation frontier, this introduction outlines the core elements of the thesis through four more sections. The first illustrates the thesis rationale, guiding questions, main argument and key contributions. The following presents the research epistemological foundations with an overview of its key theoretical and analytical categories. The concluding section offers a thesis outline as a reference map to make the reader's task easier.

1.1.1 From early environmentalism to renewable energy transitions: the 'green' as an accumulation frontier

What are the historical processes that have enabled surplus value extraction and accumulation around renewable energy generation? How have they translated into governance models? Or more accurately, how have the social critique and contestations -erupted between the 1960s and 1970s in western societies around the social and environmental consequences of capitalism- been *re-functionalised* from a potential threat to accumulation into a legitimation rationale, governance principle and new horizon for its expansion? These questions are ineludible if policy initiatives, markets and investment schemes devised, launched or already operating under 'green' credentials, such as the transitions towards renewable energy, are to be fully understood (Fairhead et al., 2012). Against this backdrop, what follows explores the 'environment' and environmentalism through a historical materialist account of their transformation, from *objects of scientifical and political denunciation*, to *extended arenas of contestation*, finally coming to be framed as an *international policy area* and investment opportunity[1].

[1] From the perspective of Hegelian dialectic, which is the philosophical foundation of this research, a re-functionalisation process can be interpreted as a *sublation*, whereby the negation of a negation evolves into a new superior entity yet including elements of the initial two (for a comprehensive review see Abbagnano, 2003). This category applied to the historical geography of capitalism calls into play the latter's capability to

Although capitalism as a mode of production was not always explicitly mentioned, criticisms against the 'economy', 'society' or the 'economic system' within proto and early environmentalist debates actually *negated* the legitimation to certain capitalism's aspects. Works such as Carson's "Silent Spring" (1965) or Ehrlich's "The population bomb" (1968) had in common a denunciation tone against the ambivalence of a system that would inextricably entangle advances in agriculture with contamination from widespread pesticide use, or -by the same token- higher levels of wealth with resource depletion and catastrophic famines from overpopulation. If technological and economic progress had brought widespread prosperity, so went the underlaying story, they were also *universalising* what Ulrich Beck would later term as the *techno-scientifically produced risk* around the environment and society itself (Beck, 1992b).

To be sure, even before the 1960's the risk-universalising potential inherent to economic and technological progress was something already known to humanity. It had experienced the devastations of World War II, its industrialised -universal- capability to destroy life, in concentration camps or through chemical weapons or nuclear bombs, such as those dropped on Hiroshima and Nagasaki's unarmed people. This awareness became even stronger with the tensions of the cold war, reminding everyone that a thermonuclear holocaust was a persistent and actual possibility, but also with an endless number of industrial disasters since the 1940s and up to contemporaneity, such as -amongst others- the 1950s London's great smog, the 1984 chemical disaster in Bhopal in India and the 1986 Chernobyl accident.

As the perception of a techno-scientifically produced risk implied its interpretation through the category of *universalism* (Azzarà, 2020; Beck, 1992b), it has become increasingly evident that it concerned all planet and humanity and, by the same token, was inextricably related to a complex and contradictory -*concrete*- totality. These connotations shaped the framing of environmental issues within the 1960s and the 1970s contestation movements (see chapter 7 and 8), which criticised the social order *universally* by positing the necessity for a radical change, when not a revolution. In these contexts, a specific type of

subvert potential threats into opportunities, through hegemony building processes legitimising the social relations, and inequalities, upon which it rests, while creating new avenues for accumulation (see chapter 3).

environmentalism emerged which *mediated* universalism through race, class and to a minor extent gender conflicts making it *concrete* or *lived*. Eloquent examples for that were the *environmental justice movement* in the US (Bullard, 1990; Mohai et al., 2009) or the *workerist environmentalism* in Italy (Barca, 2009; Paccino, 1980). In both cases universalism meant the *universalisation* of the *lived* class, racial and gender injustice, which affected life down to its bio-physical depths, but unequally -according to class, race and gender positionality, as well as the need for a radical *universal* change. This form of *concrete universalism* characterizes what Martinez-Alier would later define as the *environmentalism of the poor* (2002). As the Catalan economist explains, the world's poor struggles to defend the integrity of the ecosystems supporting their livelihoods -while pursuing very *concrete* goals dispersed throughout a myriad of geographies, play a function of *universal* importance in advancing humanity on the road towards the "environmental sustainability of the economy" (idem p. 5).

At the beginning of the 1970s, opposed to that concrete variant emerged an *immediate* or *abstract* form of *environmentalism*. This created the conditions for both the full commodification of the 'environment' and the normalisation of the discourses and practices around it (Hajer, 1997). A first tangible sign is the publication of "The Limits to Growth" in 1972 by Meadows et al. The report, commissioned by the Club of Rome[2] to an international team of scientists based at the Massachusetts Institute of Technology, illustrates the findings of a then futuristic computer model which predicted in two out of three scenarios the complete depletion of natural resources around the mid or the second half of 21st century. The report contributed to canonising environmental issues as universally significant, making them worthy of discussion in government and international fora (Hajer, 1997). Yet, in asserting their universality, the report frames environmental issues as *abstracted* from any *concrete* geo-historical context, implying that all countries, races, classes and genders are equally responsible for them, and postulating -in like manner- the existence of a global resource pool, which should be managed through technocratic governance techniques.

Throughout the last four decades, this *abstract environmentalism* has pervaded the institutionalisation of the 'environment' as a policy field and the consolidation of an

[2] The Club of Rome is a prestigious think tank, including UN functionaries, government officials, academics and business executives from around the globe.

environmental diplomacy. As a result, a number of international conventions have been signed, seeking to regulate the use of natural resources as well as coordinate international responses to pollution, biodiversity loss and climate change -compatibly with sustained accumulation (Susskind and Ali, 2014). Complementary to this has been the production of scientific studies and policy reports promoted by international organisations, providing evidence, and introducing analytical and operative frameworks (see chapter 2)[3]. The category of *sustainable development* mainstreamed by the Brundtland Report in 1987 should also be interpreted along these lines. Despite the report connotates *sustainable development* in terms of both equity *between* and *within* generations (Brundtland et al., 1987 p. 43), commitments signed a few years later at the 1992 Rio earth summit meant to translate the principle into a policy framework did not question and in fact entailed the extension of the social relations of capitalism over spaces and natures, conveying notions such as *natural capital, ecosystem accounting* and *emission trading* which *ipso facto* abstract environmental issues from their concrete historicity into the a-historical, standardised space of capital (see chapter 2).

The dialectic between concrete and abstract universalism characterised also the debate around energy, a field strictly related to environment. Similarly to the latter, energy burst onto the international scene as a source of risk during the 1970s. In 1973 the outbreak of the Yom Kippur Arabo-Israeli war led the involved Arab countries to retaliate against the United States and other western countries for their support to Israel. The Organisation of Arab Petroleum Exporting Countries (OAPEC) that they controlled imposed an oil embargo resulting in a 70 percent price surge. The embargo was one of the causes of the mid-1970s economic crisis. At the end of the decade, in 1979 a second energy shock followed the oil supply cut caused by the Iranian revolution. The restructuring of international power balances engendered by these events, widely known as the 1970s oil crises, brought to the fore an inconvenient truth. Western opulence was based on a finite, non-renewable energy source, beyond the control of capitalist centres: oil (Ikenberry, 1986).

The crises shocked core capitalist economies, from the US to western Europe and Japan, posing a strategic threat to their energy security. Concerned governments responded by

[3] Towards that an initial step was the first UN conference on the environment held in Stockholm in 1972, which established the United Nations Environment Programme (UNEP).

seeking new oil supply chains and multiplying efforts to develop alternative sources, mainly nuclear energy and coal (Ikenberry, 1986; Ikenberry, 2018), with a narrow scope for research on other sources. Governments' nuclear projects were soon contested by an international antinuclear movement which opposed to governments' strategic considerations, *abstracted* from the concreteness of life, again a *concrete universalism* framing the respect of human and non-human life as its priority (Armiero and Barca, 2004; Della Valentina, 2011). As we will see in chapter 2 and 6, both in Italy and Germany the debates within the antinuclear movement were a key arena where alternative energy sources were conceived of as *antagonistic* to the belligerent and insecure order of nuclear and oil, and -precisely from this perspective- as solutions to environmental degradation. Alternative soon became a synonym for renewable and sustainable hinting at a radical and comprehensive political project of which renewable energy sources were important yet *not the only* elements (Bruns et al., 2011; Della Valentina, 2011).

Contrastingly, in that period most of the core capitalist countries' energy policies relegated renewable sources to a marginal role. The situation changed only with signing of the Kyoto protocol in 1997, when renewable sources became a major instrument to mitigate the climate crisis and started to be supported by specific measures at both the international and national level (Bruns et al., 2011). This happened in a landscape of widespread neoliberal counterreformation reframing and reducing the role of the nation state in capitalist economies (Harvey, 2005a). If we narrow our focus down onto the EEC (now the EU), the liberalisation of the electricity market imposed by the Community's institutions since the mid-1990s, favoured the structuring of national transition policies around the principles of ecological modernisation (see chapter 2 and 6. See also Pollitt, 2012; 2019). Of the cases this research has studied, Germany, as a forerunner, introduced the first subsidisation policy in 1991. A similar policy came into force in Italy in 1996 and a non-binding target for renewable energy production was set at the EU level in 1998 (see chapter 6).

Serving as pillars of environmental policies firmly anchored to the paradigm of enduring private accumulation, renewable energy sources are transposed into an *abstract universalism* horizon of meaning positing them as mere energy sources, completely unrelated to any project of radical social change and indifferent to the historicity of the territories through which they are accessed, including their inhabiting communities. As a major

consequence of such an abstraction process, the universalist and very concrete purpose that renewable sources may serve - to decarbonise the ecosystem and preserve human and non-human life - is definitively conflated with the abstract universalism underlying market 'rationality' -tended solely to quantify and abstract the *real* into an ever-expanding accumulation frontier.

In the final analysis, renewable energy transitions based on the principles of ecological modernisation and neoliberal governance can be read as an example of how environmental concerns and contestations, initially emerged as a delimited negation of capitalism, became sublated into its universal -this time 'green'- assertion.

1.2 Rationale, guiding questions, main argument and key contributions

The preamble hints at two central questions: what are the processes through which a 'green' capitalism can translate the ecological crises into an opportunity for more accumulation? And with what effects in terms of spatiotemporal organisation and socioecological transformations?

Seen through the lens of historical materialism, these questions reflect the curiosity and interests which have fuelled the intellectual effort underpinning this thesis. Providing an answer to them is in fact its overarching purpose.

In empirical terms, the research main goal is to investigate the extraction and accumulation of surplus value as it takes place in and around the generation of renewable energy at the scale of production areas or *territories* (see chapter 4), the enclosure and transformative processes it triggers, the class and factional cooperation, or conflict, patterns it entails, and the governance processes to which it is associated in terms of both institutional structures and hegemonic narratives. Methodologically, it combines a comprehensive theoretical elaboration on 'green' capitalism and its spatial dynamics, with a case study analysis of two renewable energy production systems located in southern Italy and eastern Germany, respectively wind energy and agricultural biogas. As said, these are two marginal regions within a centre of global capitalism, the European Union. Observing their integration into unequal exchange patterns allows to explore how 'green' accumulation and uneven geographical development interplay.

In order to achieve its main goal, this research theoretical and empirical investigation is oriented by four questions:

- How it is possible to understand the consolidation of the governance systems regulating renewable energy transitions in the EU and national contexts and regions of the case studies through the historical materialist categories of sublation (re-functionalisation) and hegemony?
- How can we interpret the extraction and accumulation of surplus value in and around renewable energy in terms of the socially necessary labour time theory of value? What are the implied distribution, cooperation and conflict patterns amongst class and class factions and groups?
- How does the enclosing of ecosystem spaces (lands), stocks and flows targeted for renewable energy generation take place? Is force organised through legal frameworks, physical violence or market mechanisms, or a combination of the three?
- How does the extraction and accumulation of surplus value in and around renewable energy transform socioecological relations in the production areas, in terms of class relations and space and nature commodification (abstraction)?

1.3 The research epistemological foundation

This section discusses historical materialism as the epistemological foundation of this research and clarifies how it has informed the research questions and the overall research process. It is organised into two subsections. The first provides a broad presentation of historical materialism and introduces the core categories upon which the research theoretical and empirical analysis has been developed, such as *mode of production*, *division of labour*, *class*, *hegemony* and the *production of space*. The second section provides a working definition for *capitalism* and *'green' capitalism*, which will be refined in the course of this work.

1.3.1 The historical materialist conception of history and space

Historical materialism as a philosophical tradition offers a *universalist* yet *concrete* interpretation of *society* and *history*. It therefore allows to study social relations, and the material conditions through which they *live*, as part of a totality, whereby they are determined

and which they contribute to determine. According to historical materialism, social relations do not exist in the abstract but in the historicity of the dialectic between forces and relations of production. The dialectical ontology and gnoseology of historical materialism allow to understand geo-historical phenomena through their relationship with a *becoming whole*, which in its turn can be interpreted precisely because of the unicity of those phenomena. For this very reason, this thesis uses historical materialism to study the specificity of the socioecological relations in and around renewable energy generation and, concurrently, contextualise them within capitalism's historical geography.

From a historical materialist perspective, human societies, including their spatiality, are structured around the organisation of material life and the patterns of power, domination, and inequality this implies. These are not intended as natural facts, but rather as historical, therefore transient, formations. In a similar manner, historical materialist categories are powerful instruments through which to pierce the veil of the abstracting and technicalising rationality that characterise the policy and investment discourses around renewable energy transitions. They make the social relations characterising the extraction and accumulation of surplus value in and around renewable energy generation readable *historically*, in terms of difference and conflict, privilege and inequality, inclusion and exclusion.

For a better understanding of historical materialism as an epistemology, we will now delve succinctly into its major categories. As a philosophical tradition, it is founded on the works of Karl Marx and Friedrich Engels. Although never explicitly mentioned in any of the works the two co-authored, nor in any that Marx alone authored, a delineation of the concept appeared for the first time in "The German ideology", a set of manuscripts published posthumously (1970). By reframing Fichte and Hegel's idealism as well as Feuerbach naturalistic materialism, historical materialism posits humans as creating, and being created by, the material conditions of their existence. Confined within the limitations imposed by nature to their existence, first and foremost the laws of physics, humans produce their material, therefore intellectual, life historically and geographically through a socially regulated metabolic exchange with nature. They so transform - produce *à la* Smith (2008) - nature and in so doing transform themselves, creating commodities and social structures which are the reified appearance of underlying social relations. From this perspective the ecological crises become the expression of capitalism's social relations, instead of being the effect

of an innate human character. Put differently, they are *Capitalogenic* rather than *Anthropogenic* (Moore, 2015; Haraway, 2016). Let us examine Marx and Engel's own words:

> "The first premise of all human history is, of course, the existence of living human individuals. Thus the first fact to be established is the physical organisation of these individuals and their consequent relation to the rest of nature. [Humans] can be distinguished from animals by consciousness, by religion or anything else you like. They themselves begin to distinguish themselves from animals as soon as they *begin to produce their means of subsistence* [emphasis added], a step which is conditioned by their physical organisation. By producing their means of subsistence [Humans] are indirectly producing their actual material life" (Marx and Engels, 1970 p. 42)

As the quote indicates, it is through a material exchange with "the rest of nature" mediated by the capability to "produce their means of subsistence", or *means of production* (Marx, 1976), that humans lay the conditions for breaking natural causality and therefore for history to take place. That capability is labour, "a process between man and nature, a process by which man, through his own actions, mediates, regulates and controls the metabolism between himself and nature", as Marx will explain in "Capital" years later (idem p. 283).

Over time, the material organisation of life evolves according to the technological development of the means of production and the socially set rules that preside to their use, or the *forces* and *relations of production* (Marx, 1911; 1976). These combinations result into historical *modes of production*s, such as feudalism or capitalism are. A mode of production, however, designates more than the mere

> "[…] production of the physical existence of the individuals. Rather it is a definite form of activity of […] individuals, a definite form of expressing their life, a definite *mode of life* [emphasis added]" (Marx and Engels, 1970 p. 42)

By organising their material existence, humans *produce life*, including its intellectual and cultural determinations, not only through "procreation" but also through labour, that is a "social relationship" (ibidem). Marx and Engels explain that the adjective "social" indicates a relationship of

> "[…] *co-operation* [emphasis added] of several individuals, no matter under what conditions, in what manner and to what end. It follows from this that a certain *mode of production*, or *industrial stage* [emphasis added], is always combined with a certain *mode of co-operation*, or *social stage* [emphasis added], and this mode of co-operation is itself a «productive force». […] the multitude of productive forces accessible to [humans] determines the nature of society, hence […] the history of humanity must always be studied and treated in relation to the history of industry and exchange" (idem p. 50)

Every mode of production organises social cooperation through a distinct *division of labour*, which "determines […] the relations of individuals to one another with reference to the material, instrument, and product of labour" (idem p. 43). Any historical form of the division of labour corresponds to equally distinct forms of *ownership* and *class relations*. For instance, in the feudal society the main forms of ownership were landed property controlled by aristocracy, which commanded peasantry or serfs' labour and the ownership of urban-located productive capital by craftsmen, organised in guilds, and exploiting apprentices and journeymen's labour. Differently, under capitalism the affirmation of the wage-relation is mirrored by the expansion of capital private ownership -particularly industrial capital, and the relative decline of landed aristocracy (see chapter 3). A capitalist organisation of social cooperation, and exploitation, is structured around the main two *social classes* of capitalists and wage-labourers. We should also consider that every form of ownership over the means of production is first and foremost a form of ownership over nature[4], which are the primary source of the means and object of labour (see chapter 3). It follows that every mode of production is a way of organising the material exchange with nature through labour, that is to say a way to organise nature, establishing itself as an *ecology* (Moore, 2017; 2015), producing specific *socionature*(s), *socioecological relations* and *socioecological crises* (see chapter 3). In conclusion, from a historical materialist perspective the relation between society and nature appears as inextricably interwoven and dialectically co-constructive. In this thesis, such an interpretation has been core to exploring the extraction and accumulation of surplus value in and around renewable energy, from class and factional cleavages to processes enclosing ecosystem spaces, flows and stocks, and,

[4] Unless otherwise noted, the term *nature* is used in the course of this work to indicate ecosystem spaces, stocks and flows. Renewable energy sources are categorised as *abiotic flows* or *biotic services* (see chapter 2).

on the other hand, to comprehending the socio ecological transformations involved. Along similar lines, it has been crucial to the theorisation of 'green' capitalism advanced in chapter 3.

Taking this discussion further on, we can contend that every mode of production, characterised by a distinct division of labour and dominant form of ownership, reflects a social relation, between *ruling classes*, controlling the means of production, that is the material conditions of existence, and *subaltern classes*. Not only does the division of labour reflect the differences amongst classes and functional relations amongst productive sectors. It also determines the "relations of different nations to one another" (Marx and Engels, 1970 p. 43). Marx and Engels introduce here an important understanding of the international and geo-political implications of the division of labour which will be developed later by dependency and unequal exchange theories, and particularly by Emmanuel Wallerstein's work (2004b). The international perspective of the division of labour is also foundational in the literature around extractivism. In the course of this research, all these bodies of literature have been fundamental in investigating the function and positioning of the case study regions within the division of labour at the national or higher scales.

It is important to notice that in controlling the means of production, the ruling classes also control the production of the "ruling ideas", which "in every epoch" are the "ideas of the ruling class". That is to say that "the class which is the ruling material force of society, is at the same time its ruling intellectual force" (Marx and Engels, 1970 p. 64). This consideration will be further developed into conceiving human society as organised into *material structures* and political and *ideological superstructures*, that Marx expressed synthetically in the preface to "A Contribution to the Critique of Political Economy" (1911). The ideological predominance of the ruling class was also analysed by Lenin, who contended through it that the proletariat needed to overcome an 'economistic' vision and universalise its ideology to the entire society, by strengthening its *hegemony* through alliances with other subaltern classes (Lenin and Cox, 1911; see also Shandro, 2014). Gramsci extended this analysis to a *general theory of hegemony*, opposing versions of historical materialism positing a unidirectional relation from the structure over the superstructure, which he dubbed as 'economistic' (Gramsci, 1975; Cospito, 2016).

Through the category of *hegemony* Gramsci explained the importance of the ideological, cultural and intellectual dimensions in the historical dialectic and reframed the relation between the material structure (the forces and relations of production) and the cultural, political and ideological superstructures within historical materialism. To understand hegemony, we need to differentiate the act of *ruling* [*dirigere*] from that of *governing* and by extension the ambit of *civil society* from that of *political society* (idem). By governing, a dominating class controls the coercive and repressive power of the State, the political society. Differently, by ruling it shapes and leads the civil society. This is composed of private organisations which do not pertain to the state public sphere. Amongst them we find parties, trade unions, lobbying organisations, private or privatised research and education institutions, religious organisations and the press. A fundamental role is played by intellectuals, who -as an organic expression of a class- guide and personify these organisations and enable the dominating class to control the civil society. Through such a process, a class can universalise its ideology and win the subaltern classes' consensus. Under capitalism, hegemony ensures that subaltern classes peacefully and willingly perform the social functions necessary to both sustain accumulation and perpetuate the capitalist class domination. The control of both the state and civil society gives the dominating class *hegemony*. Upon this, an *organic relationship* (idem) between the structure and superstructure can be built and, through the convergence of the socio-economic, socio-political and military supremacy, lead to a *historical block* which finds political expression into the *integral state*, inclusive of both the political and civil society. If the dominating class loses its ideological and cultural ruling capability and resorts to the sole use of the coercing government functions, then its hegemony will crumble and an *organic crisis* will endanger the relationship between structure and superstructure. Under capitalism, Gramsci explains that the proletariat can erode such *organic relationship* through a *war of position*, that is a slow and molecular process building an anti-capitalist -and socialist- social front, with other subaltern classes, through cultural, political and ideological lead, and seek to definitively hegemonize society in view of a *war of manoeuvre*, the actual revolution. The postulation of hegemony as depending on the deliberate initiative of public and private apparatuses derives from the historical-materialist conception of history as a struggle amongst classes. Hegemony, in other words, is not given. It is rather a process which needs to be consciously nurtured if the dominating class is to maintain its grip on society or a subaltern class is to

break it. Gramscian categories of hegemony and historical block have been particularly important in analysing the consolidation of renewable energy governance systems in the EU and the national contexts and regions of case studies, and specifically to explaining the re-functionalisation of early environmentalist critique and contestation into re-legitimation framework of the capitalist mode of production.

We are now sufficiently equipped to argue that from a historical materialist perspective, history is a succession of different modes of production, expression of the class struggle as it unfolds through a dialectic between material structure and cultural, political, and ideological superstructures[5]. Every mode of production defines the conditions within which a specific epoque can develop. In "The Eighteenth Brumaire of Louis Napoleon", Karl Marx explains that

> "[Humans] make their own history, but they do not make it as they please; they do not make it under self-selected circumstances, but under circumstances existing already, given and transmitted from the past. The tradition of all dead generations weighs like an Alp on the brains of the living" (2009b p. 1)

This apparently contradictory character of the historical process, whereby humans are simultaneously determining and determined by historical -therefore natural- conditions given to their existence, points to a dialectical conception of history which Marx takes from Hegel. All the analysis, both empirical and theoretical, carried out in the present research and thesis build on a Hegelian dialectic logic and ontology. On the one hand, its arguments are constructed first in the abstract through theoretical inquiry and critical analysis of empirical cases found in relevant literature. They are then elaborated, through an empirical critique building on direct observation and multiple iterative rounds of theoretical elaboration, into a synthesis. On the other, all the observed phenomena, both those discussed only theoretically and the case studies, are conceived as resulting from and creating a historical dialectic in the *long durée*. The foundations of Hegel's dialectic are outlined in chapter 3.

[5] It is important to notice that history should be intended as marked by impurity and overlapping, whereby social relations -and their objectifications- from previous modes of production survive into the next one.

A final consideration on the spatial dimension of historical materialism closes this epistemological premiss. If social existence is dialectically determined first and foremost by the organisation of material life, then the materiality of social relations has two ontological constituents: time and space (see Harvey, 2018 p. xix). In fact, the social relations that preside to material life, that is to say all social relations, cannot exist but as happening through time and grounded in space. This is therefore where social relations exit the dreamy world of abstraction and enter the concreteness of their *becoming* as *produced space*. Essential to this is Henry Lefebvre's work. In his own words:

> "There is one question which has remained open in the past because it has never been asked: what exactly is the mode of existence of social relationships [emphasis added]? Are they substantial? natural? or formally abstract? The study of space offers an answer according to which the social relations of production have a social existence to the extent that they have a spatial existence [emphasis added]; they project themselves into a space, becoming inscribed there, and in the process producing that space itself" (Lefebvre and Nicholson-Smith, 1991 p. 129)

Hence, space is "the mode of existence" of social relations. Out of space, social relations "would remain in the realm of «pure» abstraction" (ibidem). A historical materialist conception of space as socially produced has informed the thesis theorisation and analysis of the social and spatial transformations[6], triggered by renewable energy generation under capitalism (see chapter 4).

1.3.2 Defining the key categories of this research: capitalism and 'green' capitalism

With historical materialism as an epistemological framework, this thesis draws on *capitalism* and *'green' capitalism* as core categories. While they are part of its epistemology, they are also an outcome of its theoretical and analytical elaboration. Of them, this subsection presents only the epistemological aspects which have served as instruments to the

[6] The centrality of space as an analytical category in the analysis of social relations, and specifically capitalism, has led a number of scholars, including David Harvey, to suggest a reformulation of historical materialism into historical-geographical materialism. Although the analytical process upon which the present research and thesis build is fully grounded on a spatial conception of social relations, the term historical-materialism is preferred throughout this text, with the intent of facilitating the reception of the latter within the wider and transdisciplinary currents of historical-materialism.

research process, while other elements resulting from the research process itself will be presented in chapter 3.

Capitalism is here intended as an historically situated mode of production tended to the perpetual accumulation of *surplus-value*. The latter becomes capital as long as it is reinvested perpetually and its characteristic of being *value in motion* maintained intact. Surplus value is created by *labourers* through labour, by which they transform *use values* (ecosystem spaces, stock and flows *or qualities*) appropriated from nature into commodities, which as a consequence embody an *exchange value* (a *quantity*), tradable for *money,* the *universal equivalent* (Marx, 1976; Ricardo, 1891). Thanks to the *private ownership* of the *means of production*, *capitalists* appropriate surplus-value from *labourers* who can only live by selling their *labour* for a *wage*. In order to appropriate larger shares of surplus value, capitalists continuously seek to increase *labour productivity* by investing in *organisational* and *technological change* (Marx, 1976; see also chapter 3). This has developed capitalism's force of production immensely and allowed to extend its *ecology* or *produced nature* to the entire globe (Smith, 2008; Moore, 2015; Lefebvre and Nicholson-Smith, 1991; see also chapter 3 and 4). This 'peaceful' accumulation process is accompanied by a more overtly violent *accumulation by dispossession*, entailing the more or less explicit use of force to privatise ecosystem spaces, stocks and flows, as well as other portions of the social wealth, to be converted into capital (Harvey, 2005a).

'Green' capitalism is assumed as a *hegemonic process* in the making. Its success would strengthen capitalism's resilience to the worsening *ecological crises* (Ekers and Prudham, 2017; 2018). It would also protect, at least temporarily, the socioecological relations underlaying capitalism from the *loss of legitimacy* and hence hegemony correlated with the crises.

1.4 Main argument: renewable energy as 'green' capitalism in the making

The main argument of this thesis is that the extraction and accumulation of surplus value in and around the generation of renewable energy can be regarded as a case of *'green' capitalism at work.* The thesis maintains that under capitalism the generation of renewable energy expands accumulation frontiers over not yet or 'inefficiently' commodified spaces and natures. This process implies the privatisation of ecosystem spaces, biotic services and

abiotic flows, and their abstraction into forms of *fictitious capital* –that is their commodification and financialization. It follows that, in contrast with approaches based on marginalist economics, this thesis reconciles the *socially necessary labour time theory of value* with political ecology, contending that commodified spaces and natures do not innately provide exchange value, but rather serve as a collateral to capture -by way of rent- portions of surplus value produced in society at a different point in time and space.

Correlatively, the organisation of renewable energy generation as an accumulation strategy entails the strengthening of hegemonic structures and rationalities and the re-legitimation of capitalist social relations under 'green' credentials, so serving as a *socioecological fix* (see chapter 3 and Ekers and Prudham, 2017; Ekers and Prudham, 2018; McCarthy, 2015).

Correlated to this argument are also a number of key contributions developed in both theoretical and analytical terms.

First, this thesis offers an original definition of 'green' capitalism as a *hegemonic project* in the making. As chapter 3 explains extensively, 'green' capitalism is interpreted as characterised by two interrelated dialectics tending to restructure, on the one hand, the forces and relations of production and, on the other, the cultural, political and ideological superstructures. Along these lines, forces and relations of production are reorganised through sociotechnical patterns suitable for expanding the accumulation frontier over unexploited or partially exploited ecosystem spaces, flows and stocks and transforming them into 'green' goods and services (commodities). The adjective 'green' indicates their branding in the mainstream environmental discourses as resolutive towards the ecological crises. THE thesis maintains that the transformation of ecosystem spaces, flows and stocks into 'green' commodities entails their abstraction into objects of capital (see chapter 3 and Ekers and Prudham, 2017; Ekers and Prudham, 2018; McCarthy, 2015; Corson et al., 2013).

Second, through a comprehensive theoretical elaboration and empirically grounded deductions, the thesis combines literatures on enclosure, land grabbing and internal territorialisation with those on the social production of space. As a result, it advances the analytical category of *territory grabbing*, presented in chapter 4. This is intended as a process whereby a territory, or places of it, is abstracted from its stratified historical identity,

reduced to exchange value (actual or potential) and transposed as costs and revenues into the accumulation function of an in-vestment scheme, or system, benefiting factions or groups of the capitalist class.

Third, the thesis provides a detailed account of two cases of 'green' capitalism at work. Overall, by way of comparison it finds similarities in two marginal contexts of a core and semi-core capitalism of the European Union. This suggests that those similarities are related to a comparable system of subsidisation, based on the common framework set at the EU level, and the condition of marginality itself. Specifically, the thesis shows how value extraction around industrial scale renewable energy entails the formation of class and factional territorially based alliances, including articulations of the local state and bureaucracies, along-value extraction chains determining the specialisation and positioning of the production areas or territories, within the division of labour at the national or higher levels. It also shows that the socioeconomic marginality of the production areas or territories is functional to sustained accumulation. Specifically, by guaranteeing low land prices and simplified regulatory regimes, marginality serves as a *spatiotemporal fix* (see chapter 3 and Harvey, 2018b). The thesis also explains that the revenue structure of the observed productive systems is a rentier-based regime of accumulation, based on a composite form of rent. In examining mechanisms of grabbing and enclosures, it shows that the agency of the state, either through coercive schemes or by facilitating the establishment of market mechanisms, is crucial in triggering dynamics of appropriation and expulsion which simplify the penetration of 'green' investments. Finally, it illustrates that the implementation of renewable energy projects over a large area imply the abstraction of targeted territories into mere renewable energy reservoirs and the built environment of 'green' capitalism

1.5 Thesis outline

This section is a reference map for the reader. It provides the titles and a succinct explanation of this thesis's chapters.

Chapter 2 - The theories for the 'greening' of capitalism: advancing the accumulation frontier. By focusing on a theoretical corpus here defined as the *theories for the greening of capitalism* (TFGCs), the chapter completes the exploration initiated in the introduction to this thesis, showing how long, consistent and more or less specialised debates, within

academia -across, sociology, geography and mainstream economics- but also amongst national and international institutions and private players, have reframed the 'environment' and environmentalism as a *frontier for private accumulation growth* and *legitimation rationale*. The chapter is organised into three sections. The first explains ecological modernisation foundations and its double character of political programme and social theory. The second offers an in-depth description of political economy debates around the value of nature and the functions it plays, and might play if 'efficiently' exploited, in production. The third illustrates how the practical applications of ecological modernisation and ecosystem accounting theories expand accumulation horizons.

Chapter 3 – 'Green' capitalism I. A hegemonic project in the making. This chapter and its following companion present the theoretical framework for this research. They form an interpretive continuum exploring 'green' capitalism as a variant of historical capitalism. Specifically, this chapter analyses 'green' capitalism through the socially necessary labour time theory of value, discussing both its philosophical underpinnings and analytical implications. After a short introduction, the chapter opening section quite unusually summarizes the entire theoretical framework, so placing at the start what normally appears at the end of a chapter. The intent is to provide from the outset the basic tools to navigate the thorough and articulated discussion that follows and make reading as smooth and fertile as possible. The second section analyses capitalism as a mode of production, basing on the socially necessary labour time theory of value. It illustrates categories largely discussed in historical materialism literature, since, as they are the bedrock upon which the entire thesis rests, they must be framed unequivocally. The third section investigates 'green' capitalism as a variant of historical capitalism. It first consults Hegel's philosophy, at the core of Marx's historical materialism, to clarify the nexus between nature, labour and history. Once solid philosophical grounds are established, the section continues discussing the relation between nature and labour through Marx's elaborations and Neil Smith's theory on the production of nature (Smith, 2008). It then delves into the extraction and accumulation of surplus value through *unproduced* ecosystem spaces, flows and stocks vis-à-vis the socially necessary labour time theory of value, concentrating on revenue forms and class dynamics. The section concludes by examining the function a 'green' capitalism turn may play in facilitating the reproduction of capitalist social relations, both in economic and political

terms, relying specifically on Harvey's theory of crisis and overaccumulation and Gramsci's theory of hegemony.

Chapter 4 – 'Green' capitalism II. Spatial dynamics between extractions and competing territorialisation. This chapter is intended to further our understanding of 'green' capitalism by looking at its spatial dynamics at the level of the areas where 'green' commodities are produced or extracted, hence defined as 'green' investment areas. The chapter is organised into three sections. The first focuses on the outer dimension of 'green' investment areas. Building on international political economy and extractivism literatures, it discusses their integration into the global capitalism accumulation patterns. The second looks at the inner dimension of 'green' investment areas, through the categories of *produced space, territory* and *territorialisation*. The third advances a definition of *territory* and the category of *territory grabbing and enclosure*, as a theoretical innovation for the study of 'green' capitalism spatial dynamics at the local level.

Chapter 5 – Methodology. This chapter presents the methodology of the research. By first describing the long intellectual process through which the research was ideated, the first section explains the research design, its main goal and questions. The second section discusses in depth the methods used for data collection and analysis. A reflection on research ethics and researcher's positionality concludes the chapter.

Chapter 6 - Ecological modernisation and renewable energy governance in the EU and the case study national contexts. This chapter explores the emergence of ecological modernisation as a policy approach to the governance of renewable energy generation in both the EU and the national contexts of the case studies. It aims at explaining the regulatory and institutional systems, and the historical processes from which they result, enabling the extraction and accumulation of surplus value in and around renewable energy generation, as 'green' capitalism in action. The chapter is organised into three sections. The first shows how the consolidation of the 'environment' as a policy field and accumulation horizon has informed the renewable energy governance as it takes place today in the EU. The second and third illustrate the rise of ecological modernisation in the Italian and German contexts, with a specific focus respectively on wind energy and biogas generation. They show how government's concerns for energy security and early environmental contestations,

especially around the use of nuclear energy, have combined with the national and EU regulations in making 'green' accumulation around renewable energy an actual opportunity.

Chapter 7 - Value extraction around wind energy in the Italian southern Apennine. This chapter analyses the extraction, distribution, and accumulation of surplus value in and around wind energy generation in the Italian southern Apennine, as a case of 'green' capitalism (see chapter 3). It draws on a five-month case study throughout a territory including the provinces of Benevento, Avellino, Potenza and Foggia between February and June 2018. The chapter is organised into two sections. The first investigates the case study geographical and historical context and prepares the analysis of extractive and accumulation processes in the second. More specifically, the first section provides a socio-historical account of the fieldwork region, with a focus on the region's marginality within the division of labour at the national and higher scales. Basing on this, it shows how the region historical geography has informed the patterns through which surplus value is extracted and accumulated through investment in wind energy. The second section focuses on the relations of production around wind energy generation, explaining how they make the region's marginality functional to a sustained level of accumulation. It applies the category of territorially based alliance to identify classes, factions and actors involved in the wind energy value extraction chain. It explains how the enclosure and grabbing of the fieldwork region's cheap and marginal lands facilitated by a favourable regulatory framework has served as a spatial fix to capital accumulation overall. Finally, it discusses the transformations implied by extraction and accumulation, as they are observable at several levels, from landscapes to sociotechnical organisation and democratic life.

Chapter 8 - Value extraction in and around agricultural biogas in Brandenburg and Mecklenburg-Vorpommern. This chapter discusses the extraction, distribution, and accumulation of surplus value in and around industrial scale biogas from agricultural substrata in eastern Germany[7], as a case of 'green' capitalism. Specifically, it elaborates the findings of an eight-month case study in the states of Brandenburg and Mecklenburg-Vorpommern, between May 2018 and January 2019. The chapter is divided into two sections. The first focuses on the socio-economic context of the case study through the lens of a geographical

[7] East Germany is a macro region including the territory of the former DDR and divided into five federal states or Länder: Thuringia, Saxony, Saxony-Anhalt, Brandenburg and Mecklenburg-Vorpommern.

and historical perspective. Specifically, it explores the marginality of the fieldwork region to the division of labour at the national and higher levels. It also elucidates the dynamics through which the current conditions to access to agricultural land and the agricultural sector -which are structurally linked to biogas generation- have emerged, as characterised by low prices and a concentrated ownership regime. The second section clarifies the political economy and ecology of biogas in the fieldwork region, by putting the arguments introduced in the first into motion and enriching them with new elements. More precisely, it develops a value and class analysis showing how the fieldwork region's marginality and its specific land relations have been functionalised to a sustained level of accumulation in and around biogas. This is built on three distinct analytical levels. After an investigation of the territorially based alliance controlling and organising the biogas value extraction chain, the section turns its focus onto value extraction and accumulation patterns as an intersection between land relations and subsidisation policies. In conclusion, the section explores the transformation induced by the expansion of 'green' capitalist relation over not yet or 'inefficiently' commodified land and natures.

Chapter 9 - Discussions and conclusions: renewable energy as 'green' capitalism at work. This chapter elucidates the overall significance of the findings of the case studies towards the analytical ambits delimited by the four research questions. It also explains the correlation between the thesis's empirical and theoretical elaborations and the wider debate around capitalism and its evolution. The final section is a post-scriptum casting a glance beyond the scope of an academic work.

Chapter 2 – The theories for the 'greening' of capitalism: advancing the accumulation frontier

2.1 Introduction

How have we come to speak of a 'green', 'ecological' or 'environmental' *capitalism*? And how is it possible that words such as 'green', 'ecological' or 'environmental' have become a suitable adjective for *growth*, *economy* or *capitalism*? These questions are unavoidable if policy initiatives, markets and investments devised, launched or already operating under '*green' credentials* (Fairhead et al., 2012), such as the transitions towards renewable energy, are to be fully understood. This chapter aims at providing the theoretical instruments needed to answer them and so prepare the discussion that will follow in the next two chapters about the possibility of a 'green' capitalism, through the lens of historical materialism.

By focusing on a theoretical corpus here defined as the *theories for the greening of capitalism* (TFGCs), the chapter shows how consistent and more or less specialised debates, within academia -across, sociology, geography and mainstream economics- but also amongst national and international institutions and private players, have reframed the 'environment' and environmentalism as a *frontier for private accumulation growth* and *legitimation rationale*. On closer inspection, the TFGCs appear as an attempt to embed an *ecological rationality* within the social relations of capitalism and so modernise it as a mode of production and system of governance (Jänicke, 2020). In the last three decades TFGCs' impact has been immense and not only in terms of literature production. When confronted with the mass of global initiatives and the diffusion of policies pivoting on market-based measures for a transition towards a 'greener' economy, or comparably towards ecological modernization, sustainable or 'green' growth, hardly can the economic performances be understated. In 2018, the whole of the 'green' economy was estimated to be worth more than 4 trillion USD and weigh 5 to 6 percent of the global equity market. Of it, more than 56 percent is concentrated in energy related activities, from generation to efficiency enhancing (Clements et al., 2020). If we narrow the focus down onto renewable energy, according to IRENA in 2019 some 11.5 million of people were employed in any of the

segments of the renewable value chains (IRENA, 2020). REN21, an influential global think tank, finds that 179 countries had set national renewable energy targets by 2017 (REN21, 2020). Many such countries increased those targets several times. And still, by 2023, the World Bank forecasts that investment in clean technology will peak up to 6.4 trillion USD in developing countries (Jänicke, 2020). Yet, this does not seem to have meaningful effects on the mitigation of ecological multiple crises. World average temperature is rising fast. A report sponsored by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services showed that 20 percent of terrestrial native species have disappeared since 1900 with at least 1000 species threatened by extinction (IPBES, 2019). On the other hand, many 'green' economy projects are faced with contrasting reactions. Communities living nearby wind or photovoltaic plants, or also energy crop cultivations, are often split between opponents and supporters, depending on the patterns distributing benefits and burdens amongst their members. Still, indigenous populations, inhabiting areas where some biotic or abiotic ecosystem service is exploited, are exposed to grabbing, appropriations and expulsions (Gilbert, 2016).

Despite these contradictions, if there is a common stance unifying TFGCs is that a 'green' turn of capitalism is still possible (Jänicke, 2008; Jänicke, 2020; Huber, 2000). This is based on four assumptions. First, similarly to ordinary commodities, ecosystem flows, stocks and spaces have a use value by reason of their utility, and an exchange value, by reason of their tradability. By extension the entire ecosystem has both a use and an exchange value. Second, current models of industrial production and distribution disrupt both ecosystem use and exchange value. Therefore, they are ecologically and economically unsustainable. Third, it is precisely by factorising ecosystem exchange value within the production function that its use value can be protected, and by consequence environmental sustainability ensured. Forth and most importantly, factorising ecosystem exchange value allows to leave capitalist relations of production undisturbed and in fact broadens them by generating new – 'green'- growth.

This chapter explores the TFGC through three sections. The first explains *ecological modernisation* foundations and its double character of political programme and social theory. The second offers an in-depth description of the debates around the 'value' of nature and the functions it plays, or might play if 'efficiently' exploited, in production. Towards this

purpose it focuses on the notions of *natural capital* and *ecosystem accounting*. The third illustrates how the practical applications of ecological modernisation and ecosystem accounting theories expand accumulation horizons.

2.2 Ecological modernisation: leveraging environment protection as an accumulation growth model

If the identification of the environment as a policy area is preluded by a multilateral diplomacy (see chapter 1), its full institutionalisation has been prepared by a sociological and theoretical debate merged into a framework known as *ecological modernisation*. As this section shows, ecological modernisation implies a reframing of the sustainable development category, while underlays the subsequent notions of 'green' economy and 'green' new deal, both shortly presented at the section end.

Sustainable development as it is formulated in the Brundtland report (Brundtland et al., 1987) mainstreamed in the international debate the idea that economic and environmental policy should be integrated into a homogeneous framework. Yet, clear indications on how to translate that into a working system of governance were lacking. In other words, as Gert Spaargaren and Arthur Mol noticed, "the concept of sustainable development [was] based more on opinions than on scientifically based ideas". A "more analytical and sociological concept" was needed if capitalism was to be modernized in ecological terms (Spaargaren and Mol, 1992 p. 333).

An early modernisation attempt was made by the Japanese government, which, in 1974, in the wake of the 1973 oil crisis, advanced the notion of *knowledge intensive economy*. As an innovation framework, that was meant to ease the country's dependency on imported energy, by increasing overall efficiency and also mitigate economy ecological impact (for an overview see Han and Lakshmanan, 1994). This example had a significant influence on scholars, especially, sociologists with an interest in environmental issues. A circle which developed a particularly fertile discussion gathered around the Berlin school for environmental policy research. A background was the discontent about the environmental policies in western states and specifically west-Germany (officially known as the BDR or German Federal Republic). Being questioned was an overall conception about the role of the state

based on *end of pipe* and *command and control* rationalities, whereby environmental measures played a repressive function, aiming merely at repairing damages rather than preventing them (Hajer, 1997). Such a line of argument resonated with the mounting neoliberal criticism against the pervasive role that the state had played in capitalist economies up until the 1970s. A generally increased economic efficiency could come, neoliberals argued, from the *withdrawal of the state* from the economy, so making space for markets to self-regulate (Mol and Jänicke, 2009).

With this background, Martin Jänicke, a sociologist and then west-Germany MP, in a 1982 speech before the west-Berlin parliament advanced the category of *ecological modernization*. His immediate goal was to criticise Helmut Kohl's government's economic policy, arguing that it should be *modernised* ecologically. The term, which would soon be published in "Preventive Environmental Policy as Ecological Modernisation and Structural Policy"(Jänicke, 1984), appeared initially to label no more than a political approach. A few years before, another sociologist, Joseph Huber, advanced the cognate category of *industrial ecology* in a book titled "The Lost Innocence of Ecology, New Technologies, and Super-Industrial Development"(1982). The ecological modernization of capitalism could come, following Huber, from ecologically oriented innovations of industrial policies. Such a modernisation process would *disrupt* the previous technology regime and system of governance, and replace them with greener ones[8] (Spaargaren and Mol, 1992; Mol and Jänicke, 2009).

A major contribution towards establishing ecological modernisation as a thorough social theory came from Mol and Spaargaren's work (Spaargaren and Mol, 1992; Mol and Spaargaren, 2000; Mol and Jänicke, 2009), which reframed the category of *ecological rationality*, introduced earlier by John Dryzek (1983; 2013). Differently from the latter, who conceived the category as inextricably interrelating environmentalist action and broader social change, Mol and Spaargaren argue for the "growing independence of the ecological sphere and rationality" (Mol and Spaargaren, 2000 p. 35). This way, the 'need to protect the environment' could be isolated from radical social and political implications and re-

[8] This can be read as a reinterpretation of the classical Marxian and Schumpeterian assumption whereby *creative destruction* is capitalism's major innovative -and revolutionary- capacity. Therefore, from changes in the productive structure, political modernization would follow.

functionalised compatibly with the wider capitalist production relations and system of governance, 'sanitising' the conflictual and ideological incrustations of environmentalist debates layered since the 1960s. As a consequence, Mol and Spaargaren could contend that capitalism "does not necessarily contradict significant environmental improvements and reforms", since it would be an ideological bias to believe that "more production and consumption" might necessarily "have to imply more environmental devastation (pollution, energy use, loss of biodiversity)" (idem p. 36).

The process of separation and re-functionalisation of the ecological rationality was instrumental to the normalisation and co-optation of part of the environmental movement within the principles of neoliberal governance. Increasingly, a number of international environmentalist NGOs endorsed an ecomodernist vision, abandoning a conception of environmentalism based on voluntary work, mass participation and contestations, caution towards capital and governments, and tendency to generate counter-knowledges. They rather professionalised, shifting towards an organisational model based on small teams of specialised employees, and a participation based on subscription and donation for non-specialised audience and good attitude towards cooperation with private capital and public institutions in policy making (for a comprehensive overview see Mol et al., 2009).

Today ecological modernisation is a well-recognised theoretical framework and a widespread policy approach that has underlain the emergence of fast expanding economic sectors such as renewable energy production and carbon trading. Jänicke (2020) ascribes its success precisely to the fact that it is an interest-driven approach rather than a normative-driven one. Since its pioneering phase, ecological modernisation is conceived as an attempt at dialogue between ecology and economy, denying the former priority over the latter (Mol et al., 2009).

A cognate notion to ecological modernization is that of *'green' economy*. Its first formulation traces back to a study commissioned in 1989 by the UK's government to ascertain whether there was a consensus definition on sustainable development, entitled "Blueprint for a Green Economy" (see the updated edition: Barbier and Markandya, 2013). The term was used again by Michael Jacobs in his ''The green economy: Environment, sustainable development and the politics of the future'' (1993). The notion popularity raised amidst international initiatives to boost the recovery after the 2007 and 2008 financial crises. In

2008, UNEP launched the Green Economy Initiative (GEI) "to assist governments in greening their economies by reshaping and refocusing policies, investments and spending towards a range of sectors"[9] based on clean technologies and environmentally minded management. In light of its goals the GEI sponsored a report published in 2009, the "Global Green New Deal" [10]. The *'green' new deal* is yet another notion floating in the public debate to signify a rather vaguely defined ecological transition compatible with capital accumulation.

This section has discussed the affirmation of ecological modernisation as a theoretical framework and political approach reconciling the ecological rationality with the perpetual accumulation growth paradigm and neoliberal governance principles.

2.3 Nature as capital. Political economy debates from nature's rule to nature's trading

What is the role that nature plays in production and how to account for it? This is a central question around which mainstream debates on the 'greening' of capitalism revolve. By the same token, it is the read thread connecting the many themes and discussions presented below, with a focus on the reframing of nature from a repository of use values into a reservoir of exchange values.

In modern times, early theses about the role nature plays in creating material wealth trace back to the 18th century French enlightenment. In the wake of this vast rationalist political and intellectual movement, a group of thinkers known as the *Physiocrats* or *les économistes* emerged. The term *physiocracy*, composed of the Greek words *physis* (nature) and *kratos* (power), translates literally into *nature's rule*. By extension, it designates an economic theory according to which all value comes from nature, and specifically from agricultural soil productivity. Physiocracy influenced *classical economics* (Steiner, 2003). This, however, in exploring nature's role in production focused more on the difference between *use value*, that is the utility of an object in satisfying a human need or purpose, and

[9] The full presentation of GEI is available at https://www.greeneconomycoalition.org/members/un-environment-programme-gei#:~:text=The%20United%20Nations%20Environment%20Programme,energies%2C%20water%20services%2C%20green%20transportation

[10] The full report is available at https://wedocs.unep.org/rest/bitstreams/11748/retrieve

exchange value, that is the value of an object as proportion of another. Useful objects could so be bartered or traded at *prices* expressed in terms of a universal commodity, that is *money*. It was the tradability that transformed an object into a *commodity* (Whaples and Parker, 2013). Adam Smith, a founder of Classical economics, argued that natural agents, for instance soil productivity, appropriated and processed through human labour can produce exchange value in the form of rent (2010). Along these lines, classic economists, such as Say, Ricardo and Malthus, maintained that nature only provides use values with no exchange value *per se* (Whaples and Parker, 2013). An example can be clarificatory here. If we take the case of a waterfall, it acquires exchange value only when appropriated and exploited through a water wheel. The land wherein the waterfall is located can be rented on the promise of future profits realised by producing and trading, for instance, fabrics woven through water-powered looms. We can deduce that "natural agents", as Ricardo explains "are serviceable to us, by increasing the abundance of productions, by making men richer, by adding value in use; but as they perform their work gratuitously, as nothing is paid for the use of air, of heat, and of water, the assistance which they afford us, adds nothing to value in exchange" (Ricardo, 1891 p. 271).

If Classical economists interpreted "natural agents" as serviceable forces which "gratuitously" add "value in use", this should not let us think that they considered them as inexhaustible (ibidem). Elaborations such as the Ricardian law on diminishing returns on lands or Malthus population theory, geometrically correlating population growth, resource consumption and economic crisis, all share an embryonic concept of natural -ecosystem- limit. This, unsurprisingly yet contradictorily, makes "natural agents" shift from "making men richer" to actually constraining economic growth (idem).

The idea of limit, or rather of the *unsustainability* of capitalism, runs also through Karl Marx's historical-materialist critique of classical political economy. To fully understand this, we can rely on John Bellamy Foster's exegetic work on Marx's ecological thought (Foster, 1999; 2000). Foster shows how the Trier's philosopher was deeply influenced by von Liebig's studies. This is a German agro-chemist who sought to find an explanation, and a solution, to agricultural soil exhaustion, a compelling problem of his times. Von Liebig identified as cause the break of soil nutrient cycles induced by intensive-extensive production and long-distance trading. Industrial agriculture, he held, in order to feed an increasing

urban, and industrial, population, made production scales sensibly larger, so demanding ever bigger quantities of nutrients be withdrawn from soils. These, along the food containing them, were shipped to far away urban centres. Here they were eaten, digested and ended up wasted in urban sewages. This way, nutrients would never return to the origin soils, which would become ineluctably impoverished. To the contrary, nutrients would over-concentrate in body of waters or fields, polluting them.

When Marx read von Liebig's work, Foster explains, he correlated England's soil exhaustion and the exploitation of labourers as both caused by capitalism's restless drive to accumulation. He therefore interpreted soil overuse and labour exploitation as consequences of the same process: surplus value extraction and its endless accumulation through industrial production (see chapter 3). When Marx argues in the third volume of Capital that "the industrial system applied to agriculture […] enervates the workers there, while industry and trade for their part provide agriculture with the means of exhausting the soil" (Marx, 1993 p. 950), he is saying, according to Foster, that capitalism cannot subsume labour as an instrument of capital accumulation, unless it does the same with nature. Not only is it so because labourers, as humans, are evidently part of nature, but more precisely because labour is a mediation process between man and nature (Marx, 1976). If such subsumption results primarily in the formation of a proletarian class, it also implies that "capitalist production […] on the one hand […] concentrates the historical motive power of society [labourers]; on the other hand, […] disturbs the *metabolic interaction* [emphasis added] between man and the earth" (Marx, 1976 p. 637), in the ways explained by Liebig. In this context, "large landed property reduces the agricultural population to an ever-decreasing minimum" in the face of "an ever-growing industrial population crammed together in large towns" and so "produces conditions that provoke an irreparable rift in the interdependent process of the *social metabolism* [emphasis added]" (Marx, 1993 p. 949), that is an inextricably interwoven bound of socioecological relations. While holding that "all progress in capitalist agriculture is a progress in the art, not only of robbing the worker, but of robbing the soil"(Marx, 1976 p. 638), Marx describes the geographical and political implications of such art, when a colonising power grabs the colonies' land to boost its own development. Eloquent is the examples of Ireland, whose soil was "indirectly exported" into England in

the form of vegetables “without as much as allowing its cultivators the means for making up the constituents of the soil that had been exhausted” (Marx, 1976 p. 860).

Marx’s exploration into capitalism’s revolutionary, and disruptive, power on social metabolism frames capitalism-driven ecosystem disequilibria as a consequence of capital accumulation and interclass power relations. It also offers early references to the irrationality and cost-ineffectiveness of capitalism’s scarce circularity, making it possible, for instance, that in places like “London […] they find no better use for the excretion of four and a half million human beings than to contaminate the Thames with it at heavy expense” (Marx, 1993 p. 195). Yet, although the use capitalism makes of social metabolism may well imply the break of the latter and generate costs for the whole of society, Marx notices that natural processes are appropriated freely by capitalists who control them. In such sense, Marx’s approach is aligned to classical economics, conceiving “natural elements” as only providing use-values, “entering as agents into production, and which cost nothing, no matter what role they play in production”. In fact, these “do not enter as components of capital, but as a *free gift* [emphasis added] of Nature to capital, that is, as a *free gift* [emphasis added] of Nature's productive power to labour, which, however, appears as the productiveness of capital, as all other productivity under the capitalist mode of production. Therefore, if such a natural power, which originally costs nothing, takes part in production, it does not enter into the *determination of price* [emphasis added]” (Marx, 1993 p. 879).

It was exactly around the “determination of price” that Classical economists’ theoretical effort failed, so remaining unable to provide exchange value a ponderable dimensionality. In other words, they did not solve the dilemma about why on earth useless commodities, such as diamonds, cost more than vital ones, such as water. A solution came from the so called *marginalist revolution*, considered as the foundational innovation giving birth to *neoclassical economics*. Three thinkers, Jevons in England, Walras in Switzerland and Menger in Austria started to elaborate an analytical theory of utility and rational choice in condition of scarcity. Their initially unrelated works came together to state that the cost (price) rational agents are ready to pay for a given good is determined by the *marginal utility* they derive from an adding unity of that good. Following this argument, diamonds are costlier since they are scarcer than water. Still, in the extreme condition of being dehydrated in a desert, with extreme water scarcity inside and outside the body, rational individuals would

exchange diamonds for water. Marginalists main achievement was to restrict economics analytical scope to exchange and exchange value and specifically to market price formation. Prices, and their monetary form, could now be investigated through mathematical analysis. Markets mechanisms were so conceived as unrelated to any social or institutional arrangements, pushing economics assumptions beyond social sciences to an epistemological area bordering natural ones (Clarke, 1991).

The enhanced measurability of exchange value laid the conditions for a quantitative assessment of the benefits provided by the ecosystem, as well as the damages inflicted to it. Building on a debate between utilitarian philosophy and economics around market failures and external effects of the economic activity, Alfred Marshall propaedeutically introduced the concept of *external economies* (Marshall, 2009). It designated those processes significant to a firm, yet external to its direct control. As an example, we can consider technological innovation. This is largely a result of competition and research within the entire productive system, but still benefits the single firm. Arthur Cecil Pigou further expanded this idea of external or third-part economic effects, with the aim of devising "practical measures which statesmen may build upon the work of the economist" (Pigou, 2013 p. 10). Such measures should serve to promote welfare, or rather "that part of social welfare that can be brought directly or indirectly into relation with the measuring-rod of money" (idem p. 11), since "the one obvious instrument of measurement available in social life is money" (ibidem). With such glaring reference to the quantitative (monetary) measurability of social utility in the background, Pigou explains that the discrepancy between the social and private cost of doing business might "damage the national dividend [income]" (idem p. 126). Such market failure or *spillover effect* occurs when a third party receives a benefit from or pays a cost produced by an economic actor while the latter is fulfilling its self-interests. In the first case we are faced with a *positive externality* in the second with a *negative externality*. It is easy to notice that pollution may be counted as an occurrence of the latter. Take the case of an oil refinery. Producing gasoline or diesel generates profits which line the refinery owners and managers' pockets. Obviously, it also generates costs. Besides those directly involved by production, external costs arise. At a local level, the refinery imposes healthcare costs to those living in the surroundings and falling sick because of the pollutants it emits, at a global level it induces costs from the adaptation to the

climate crisis it contributes to exacerbate because of the GHC it releases in the atmosphere. In other words, the refinery's profit figures are distorted by that it offloads costs onto third parties or the wider society. If costs were properly accounted for, it might not be convenient to run the plant, and the company owning it might repurpose its business model towards "cleaner" or "greener" sectors. To correct such distortions, Pigou's proposed to allocate costs and benefits by taxing negative externalities, since "industrialists are interested, not in the social, but only in the private, net product of their operations", hence "[policy] interference with normal economic processes may be expected, not to diminish, but to increase [national] dividend [income]" (idem p. 149).

The concept of externality played a key role in expanding neoclassical economics scope so as to internalise environmental considerations into the production function. Such an effort was endeavoured by the economists that since the early 1960 gathered around the Society of Environmental and Resource Economics. They mainly concentrated on architecting methods and models suitable for evaluating ecosystem processes in monetary terms (Gómez-Baggethun et al., 2010). Echoes from the rising environmental debate in other sectors of society breached the walls that in neoclassical theory were increasingly separating productive cycles from natural resources. Since the 1930s, in fact, neoclassic theorists were seeking to prove the *substitutability* between manufactured capital and other inputs, such as land. The apex was reached with Robert Solow's economic growth theory, postulating natural resources complete substitutability over time thanks to technological progress (Solow, 1986; 1974).

Different understandings of manufactured capital substitutability led heterodox thinkers to part from the community around the Society of Environmental and Resource Economics and founded Ecological economics (Von Bertalanffy, 1968; Daly, 1991; Georgescu-Roegen, 1971). Ecological economists held that ecosystem processes, land, and natural resources in the first place, were rather in a relation of *complementarity* with (human made) manufactured capital. In other words, several natural resources or ecosystem processes cannot be replaced by manufactured capital, and even more so because, as Gerogescu-Rogen clarifies, "[*manufactured*] capital cannot be reproduced without an additional supply of natural resource an additional supply of natural resource" (Georgescu-Roegen, 1986 p. 12). Natural resources or ecosystem processes therefore must be preserved from depletion, if

the system is to be sustainable. Such a thesis is also known as *strong sustainability*, as opposed to *weak sustainability*. In this last case, the principle of *substitutability* and technological progress would make up for natural resource scarcity, whose "exhaustion" would just be, in Solow's own words, an "event, not a catastrophe" (1974 p. 11).

Regardless of the various modulations sustainability has taken throughout the last three decades, its epistemological foundation results from a discursive contamination. In an effort to understand the dialectics between nature and value extraction, Ecological Economists imported into economics new concepts from *ecology* such as, amongst others, *ecosphere*, *natural cycles*, or *ecosystem functions.* Those concepts, which originally were not necessarily correlated to human welfare, came to be strictly defined by their use value. Once their significance to wealth production became more and more endowed with clear *identifiability* and *quantifiability*, they also acquired properties such as *appropriability*, *tradability* and '*accumulability*', attaching to them the exchange value that unavoidably characterises a *commodity*. This can be regarded as a *commodification* process underlain by three assumptions. First, humankind is the sole owner of the ecosphere, all other beings and ecosystem segments are regarded as objects. Second, those objects have a marginal and monetarily quantifiable utility to self-interest fulfilling. Third, clear property rights can be established on parts or the totality of the ecosphere, through *privatisation* or *enclosure*[11].

Commodified ecosystem flows, stocks and spaces can enter the production function as a form of capital, and exactly as *natural capital*. The category, both of philosophical and economic nature, was advanced first by Shumaker in his "Small is beautiful" (1973), to define "the irreplaceable capital which man has not made, but simply found, and without which he can do nothing" (idem p. 14). Schumacher explains that if we "take a closer look at this *natural capital* [emphasis in the original]" (idem p. 15), we find that it is composed of "fossil fuels, the tolerance margins of nature, and the human substance" (idem p. 20). Such "items", he goes on clarifying, are treated "as income items", when they "are undeniably capital items" (idem p. 15). Their scarcity is so disregarded that "the modern industrial system, with all its intellectual sophistication, consumes the very basis on which it has been

[11] We will further take privatisation and enclosure processes by looking at their specific spatial dynamics in chapter 7 and 8.

erected", since "it lives on irreplaceable capital which it cheerfully treats as income" (idem p. 20).

Before long, the category was taken up by Ecological Economists, who found it particularly useful to clearly label that form of capital which they deemed complementary -irreplaceable- rather than substitutable. In 1977 Herman Daly refined the notion, specifying that it includes "natural stocks that yield flows of natural resources and services without which there can be no production" (Daly, 1991 p. 249). Besides natural resources, Daly argues, natural capital stocks provide *services*. The same year Westman published an article titled "How much are *nature's services* worth [*emphasis added*]?" (1977), endeavouring to show "the importance of accounting" for the "social benefits of ecosystem functioning" (idem p. 960). After a short period of gestation, such *benefits* will be systematised under the new category of *ecosystem services* introduced in 1981 by Ehrlich and Ehrlich. It took more than a decade for the category to become mainstream and start spreading outside academic circles. Particularly important was a paper titled "the value of the world's ecosystem services and natural capital", published by Costanza et al. in 1997. The work enriched Daly's definition, specifying that "ecosystem services consist of flows of materials, energy, and information from natural capital stocks" (idem p.254). The authors also contended that these "combine with manufactured and human capital services to produce human welfare" (ibidem), so clarifying that they were on the side of those rejecting capital substitutability. In effects, "although it is possible to imagine generating human welfare without natural capital and ecosystem services in artificial 'space colonies', this possibility is too remote" (ibidem). Yet, the real novelty of the paper was in the financial estimation of ecosystem services it provided. In its very caption we can read that that "for the entire biosphere, the value (most of which is outside the market) is estimated to be in the range of US$16-54 trillion ($10^{12}$) per year, with an average of US$33 trillion per year" (idem p. 253). Such precision spoke the language of business and policy, showing, or at least claiming, that there were uncharted profit territories to conquer.

Profits, however, do not come from a mere valuing or accounting exercise. They can only be realised only through functioning markets where exchange value can be cashed in. Rightfully, Kosoy and Corbera (2010) stress that the last phase of the commodification process comes when natural capital and ecosystem services are articulated into markets,

which must be suitable for operationalising exchange between service providers and buyers. This point poses some analytical and practical challenge. Unlike manufactured capital, natural capital comes with no clear property titles. We will explore with the due attention this element in the next section. Here we will confine ourselves to noticing that in a mode of production based on self-interest maximisation and private ownership such as capitalism, postulating the existence of a natural capital involves *ipso facto* its potential privatization. Yet, fencing of forests, channelling of rivers or patenting of biotic material are not self-legitimising processes, since forests, rivers or biotic materials are all unproduced and appear at first as commons. In short, unless legitimised, their appropriation might be resisted and therefore ignite conflicts. A pioneering and foundational work legitimising commons appropriation was authored by Garrett Hardin, an American biologist[12]. In 1968 he published an article titled "The Tragedy of the Commons", where he sought to show that the commons -and by extension the ecosphere- must be put under a clear private ownership regime, because "freedom in a commons brings ruin to all" (idem p. 1242). To build his argument, Hardin used the example of an open pasture accessed by herdsmen coordinated only by the pursuing of self-utility. The open access, Hardin contended, would prompt each herdsman to freeride and so increase her cattle to the point of overgrazing, with an inevitable pasture depletion speaking ruin to everyone. Hardin's article core tenet was that not "anyone has invented a better system" to avoid the "tragedy of the commons" than "the alternative we have chosen [*that*] is the institution of private property coupled with legal inheritance" (idem p. 1247). Hardin's line of reasoning soon became the reference paradigm for natural resource management under neoliberal governance despite the very little evidence underlaying it (Gómez-Baggethun et al., 2010; Bromley and Cernea, 1989), showing its affinity with archetypes of neoliberal ideology. As Angus notices, "Hardin assumed that human nature is selfish and unchanging, and that society is just an assemblage of self-interested individuals who don't care about the impact of their actions on the community". Conversely, Angus continues "the universal human nature that he claimed would always destroy common resources is actually the profit-driven *grow or die* [*emphasis added*] behaviour of corporations" (Angus, 2008).

[12] Harding had evident eugenicist tendencies, discussing the overpopulation issue also in terms of enforcing "control of breeding" of the "genetically defective" (Hardin, 1961 p. 707)

This section has retraced the long intellectual path factorising nature into natural capital and ecosystem services, available for monetisation.

2.4 The markets for ecosystem services as a case of ecological modernisation at work

This section describes the practical applications of TFGCs. It first discusses the preparatory initiatives promoted by international institutions, then illustrates operative examples of markets for ecosystem services.

Since the end of the 1990s natural capital and ecosystem services were ultimately institutionalised as categories of the policy discourse and their articulation into markets could finally spread. Harbingers to that were the publication of the Brundtland Report (Brundtland et al., 1987) and the Rio Earth summit in 1992. While the first raised the category of sustainable development to the status of policy principle, the second ratified it and laid down the basis for its implementation, by reframing it. Particularly important was a priority for identification and quantification set forth in two of the major outcomes from the summit. The first is the Convention of Biological Diversity (CBD) signed at the summit. The CBD's 25th article entrusted the CBD's Conference of parties with providing "scientific and technical assessments of the status of biological diversity". The second is Agenda 21's 8th chapter, which identifies "integrating environment and development in decision-making" as a priority. This should happen also through "establishing systems for integrated environmental and economic accounting". As "a first step" to incorporate "sustainability into economic management", this would rest, amongst others, on a "better measurement of the crucial role of the environment as a source of *natural capital* and as a *sink* [emphasis added] for by-products generated during the production of man-made capital and other human activities"[13].

In 2001, Kofi Annan, the then UN's Secretary undertook to implement the indications from the CBD and Agenda 21 and launched the Millennium Ecosystem Assessment (MA), which is, we can read on the official website, a "state-of-the-art scientific appraisal of the

[13] The full text of Agenda 21 is available at https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf

condition and trends in the world's ecosystems and the services they provide"[14]. MA's outcomes were published in 2005, in several reports that offered a first institutional definition of ecosystem services as the "the benefits people obtain from ecosystems" and categorised them. Therefore, these were organised into four categories: (i) provisioning services (e.g. fresh water, food); (ii) regulating services (e.g. climate and are quality, nutrient control); (iii) cultural service (landscape, spirituality); (iv) supporting services (e.g. soil formation, photosynthesis).

Parallelly to MA a System of Environmental-Economic Accounting was developed, as a branch of the System of National Accounts (SNA), which is an international standard framework for national accounts. A very first attempt was the interim version of the Handbook of National Account dedicated to the "Integrated Environmental and Economic Accounting", also known as SEEA-1993 (UN, 1993). There, we can find another early institutional definition of natural capital as consisting of "biological assets (produced or wild), land and water areas with their ecosystems, subsoil assets and air" (idem p. 8). We can notice that the concept of service is not yet associated to natural assets. This will happen with the UN's glossary of Environment statistics (UN, 1997), where natural capital is described as the "natural assets in their role of providing natural resource inputs and environmental services for economic production" (idem p. 50). Natural capital definition will be progressively perfected through increasingly quantifiable specifications of ecosystem services, and other subcategories, advanced in the newer revisions of SEEA. As a result of an inter-institutional group including national statistical offices and several international agencies, SEEA-2003 specified that natural capital "is generally considered to comprise three principal categories: natural resource stocks, land and ecosystems" which "all are considered essential to the long-term sustainability […] for their provision of *functions* [emphasis added] to the economy"(UN, 2003 p. 5). Those functions are classified, into stocks, sinks (absorbing production waste), and services. Such processes culminated with the publication in 2012 of two separated documents. One, called "SEEA-2012 Central Framework", focuses only on *physical flows*, intended as "movement and use of materials, water and energy" (UN, 2014 p. 25), and *environmental assets*, intended as stock of resources "that may provide resources for use in economic activity" (idem p. 134), both considered

[14] The official MA website is available at https://www.millenniumassessment.org/en/About.html

unrelatedly with each other. The second, the "SEEA-2012 Experimental Ecosystem"(UN et al., 2014) Accounting, centres explicitly on ecosystem services, wherein physical flows and environmental assets are considered only in terms of relations with either each other or the economic activity. The intent was to provide a set of accounting instruments immediately compatible with SNA and therefore usable, so separating them from those still at an experimental stage. The "SEEA-2012 Experimental Ecosystem Accounting" is now being reviewed[15]. Particularly important to international ecosystem accounting is the contribution provided by the European Environment Agency (EEA), through the development of a framework known as the Common International Classification of Ecosystem Services (CICES). This uses the definition of natural capital adopted by the European Union (Maes et al., 2013), according to which, natural capital is composed of two elements, distinguishable by the presence of the breadth of life. On the one hand there is *ecosystem capital*, wherein living and non-living elements mix in ecosystems, on the other there are "sub-soil assets" and "abiotic flows", such as wind and solar energy (idem p. 31). Both SEEA and CICES are correlated to "The Economics of Ecosystem and Biodiversity" (TEEB), an intergovernmental global initiative. Besides contributing to ecosystem services systematisation, TEEB's core mission is to popularise ecosystem services and natural capital as operative concepts amongst target audiences such as modelers, economists, managers and policy makers. It started with a study commissioned jointly by Germany and the EU at the 2007 Potsdam's G8+5 and coordinated by Pavan Sukhdev (TEEB, 2008), a former Deutsche Bank banker, now head of the World Wildlife Fund (Corson and MacDonald, 2012).

In their effort to articulate natural capital and the ecosystem as a viable pattern for accumulation and by consequence make *markets for environmental services* (MES) fully operational, we can argue, with Corson and MacDonald (2012), that international institutions in coordination with NGOs and business organisations follow two lines of action. One, more metro-technical, is intended to qualify and quantify natural capital. The other, of discursive nature, is meant to legitimise the latter as a governance principle. Following TEEB's motto as it appears on its official website, "making nature's values visible"[16] would

[15] For further details see https://seea.un.org/content/seea-experimental-ecosystem-accounting-revision
[16] TEEB's official website is available at http://teebweb.org/

seem the only way to convince capitals and politicians to protect it, *de facto* equating ecosystem privatisation with its protection.

A good example of operating MES are carbon markets, such as the one created under the Kyoto protocol or the EU Emission Trading System (EU ETS). These are regulated cap-and-trade mechanisms, whereby an authority, such as a state or an international agency, allocates limited quotas of permits to pollute, or carbon credits, to emitting industries and plants. These can exchange permits on a market, selling them if they emit less or otherwise buying them. Carbon so becomes an asset backing a financial commodity: the carbon credit. Related to MES are *Payments for Ecosystem Services* (PES). In such market schemes a legal entity is paid to maintain an ecosystem service, such as carbon sequestration. A framework negotiated under the United Nations Framework Convention on Climate Change (UNFCCC) for the management of forests as carbon stocks is the best point in case. This is known as "Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries" (REDD+). Tropical forest countries taking part in REDD+ are paid to reduce (potential) emissions through projects contrasting deforestation or forest degradation. Similar to REDD+ are voluntary offsetting credits, providing emitters the opportunity to voluntarily offset their emission localised somewhere, by financing offsetting projects somewhere else, regulated under private standards. One of the most known is the Verra's Verified Carbon Standard (VCS), which issues more than 70 percent of its permits against projects in agriculture, forestry, and other land uses (AFOLU).

Carbon pricing is not the only operative principle organising MES and PES aimed at decarbonisation. Research, development, and commercial investments can be supported directly through public subsidisation policies. The most eloquent case is that of biotic and abiotic flows, such as wind kinetic potential, photovoltaic radiation, geothermal heat or agricultural soil productivity, providing low-carbon renewable energy. The great majority of such polices are based on a pretty simple mechanism. Governments impose a fiscal levy, often granting partial exemptions to large emitters, with the justification of defending their international competitivity (see chapter 6). The levy is legitimised by the urgent need for decarbonisation. With the raised funds, the government finances private accumulation, which is therefore legitimised, in turn, as the solution to produce 'clean' renewable energy.

At the same time, a smaller proportion of the funds may be paid back, through fiscal systems or private agreements, to the territorial communities inhabiting the areas where the ecosystem biotic or abiotic flow transformed into renewable energy is located. We will see in chapter 7 and 8 how this raises important questions about the sharing of the burdens and costs related to renewable energy transitions amongst groups and communities.

This chapter has discussed the TFGCs, with a focus on notions such as ecological modernisation, natural capital and ecosystem accounting. It has shown in detail that TFGCs postulate the logical equivalence between the protection of the ecosystem and the extraction of value from it, and how that informs the policy frameworks building on them. The next two chapters analyse FGCSs underlying assumptions through a historical materialist framework revolving around the *socially necessary labour time theory of value* (Marx, 1976; Harvey, 2018b) and the theory about the social production of nature (Smith, 2008).

2.5 Conclusions

This chapter has investigated the incorporation of an ecological rationality into the social relations of capitalism as a mode of production. Towards this purpose, the chapter has explored theoretically the rise of a 'green', 'ecological' or 'environmental' capitalism. Specifically, it has identified the TFGCs. This is a corpus of theories whose core function is to reframe categorial systems and discursive frameworks around the environment and environmentalism into instruments for expanding the accumulation frontier and its legitimation rationale over ecosystem spaces, flows and stocks not yet or 'inefficiently' commodified.

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Chapter 3 – 'Green' capitalism I. A hegemonic project in the making

3.1 Introduction

This chapter and its following companion present the theoretical framework for this research. They form an interpretive continuum exploring 'green' capitalism as a variant of historical capitalism. Specifically, this chapter analyses 'green' capitalism through the *socially necessary labour time theory of value*, discussing both its philosophical underpinnings and analytical implications, while the companion investigates 'green' capitalism spatial dynamics.

The following section quite unusually summarizes the entire theoretical framework, so placing at the start what normally appears at the end of a chapter. The intent is to provide from the outset the basic tools to navigate the thorough and articulated discussion that follows and make reading as smooth and fertile as possible.

The third section analyses capitalism as a mode of production, basing on the socially necessary labour time theory of value. It illustrates categories largely discussed in historical materialism literature, since, as they are the bedrock upon which the entire thesis rests, they must be framed unequivocally. The fourth section investigates 'green' capitalism as a variant of historical capitalism. It first consults Hegel's philosophy, at the core of Marx's historical materialism, to clarify the nexus between nature, labour and history. Once solid philosophical grounds are established, the section continues discussing the relation between nature and labour through Marx's elaborations and Neil Smith's theory on the *production of nature* (Smith, 2008). It then delves into the extraction and accumulation of surplus value through ecosystem spaces, flows and stocks vis-à-vis the socially necessary labour time theory of value, concentrating on revenue forms and class dynamics. The section concludes by examining the function a 'green' capitalism turn may play in facilitating the reproduction of capitalist social relations, both in economic and political terms, relying specifically on Harvey's theory of crisis and overaccumulation and Gramsci's theory of hegemony.

3.2 The theoretical framework, an overview

This section is a synthetic account of the theoretical framework of this thesis, which will be discussed in depth in this and the following chapter. If we were to indicate three categories around which all the others revolve, they would be *capitalism, 'green' capitalism* and *territory grabbing*. This research, and therefore its theoretical framework, are intended to contribute and innovate the philosophical tradition of historical materialism. Thereby, all the categories illustrated and examined draw on that tradition and its thinkers, 'dialoguing' mostly with Karl Marx, G.W. Friedrich Hegel, David Harvey, Neil Smith, Antonio Gramsci and Emmanuel Wallerstein, amongst others.

Our point of departure is *labour*, which is intended as a process by which humans mediate their exchange with *nature*. Although labour itself is a *force of nature*, it is directed by self-conscious will. Labour is therefore a material transformation activity through which humans try to adapt the causality and contingency of nature to their own socially determined wants and needs. By the same token society is part of nature, but it is dialectically differentiated from the latter through *history*, which results from class and power relations organising the material conditions of existence in historically determined modes of production (Marx, 1976; Marx and Engels, 1970). They are characterised by a specific development of productive forces and relations of production, as well as by cultural, political and ideological systems whose function is to ensure *hegemony* to the power balances amongst classes underlying them (Gramsci, 1975). It follows that every mode of production is a way of organising the material exchange with nature through labour, that is to say a way to organise itself as an ecology (Moore, 2015; Moore, 2017; Moore, 2018 and see subsection 3.4.2), producing specific *socionature*(s), *socioecological relations* and *socioecological crises* (see subsection 3.4.3)[17].

Capitalism is interpreted as a historically situated mode of production tended to the private and perpetual accumulation of *surplus-value*. This becomes capital as long as it is reinvested perpetually and its characteristic of being *value in motion* maintained intact. Surplus value is created by *labourers* through labour, by which they transform *use values* (ecosystem spaces, stocks and flows *or* qualities) appropriated from nature into commodities,

[17] See footnote 4.

which as a consequence come to embody an *exchange value* (a quantity), tradable for *money,* the *universal equivalent*. Thanks to the *private ownership* of the *means of production*, *capitalists* appropriate surplus-value from *labourers* who can only live by selling their *labour* for a *wage*. In order to appropriate larger shares of surplus value, capitalists continuously seek to increase *labour productivity* by investing in *organisational* and *technological change* (see subsection 3.3.2. See also Marx, 1976; Harvey, 2018b). This has developed capitalism's forces of production immensely and allowed to extend it as an *ecology* or *produced nature* to the entire globe. As a consequence, permanent ecosystem transformations are entailed, which the categories of *Anthropocene* or *capitalocene* seek to describe (see Moore, 2015; Moore, 2017; Moore, 2018 and subsection 3.4.2). This 'peaceful' accumulation process is accompanied by a more overtly violent *accumulation by dispossession*, entailing the more or less explicit use of force, in the disparate and non-mutually exclusive forms of physical coercion or threatening, legal enforcement or economic constraints deriving from market mechanisms, in order to privatise ecosystem spaces, stocks and flows, as well as other portions of the social wealth to be converted into capital (see Marx, 1976; Luxemburg, 2015; Harvey, 2005a and subsection 3.3.3).

'Green' capitalism is therefore defined as a *hegemonic project* in the making, for the transformation of capitalism. A successful outcome of such transformation would strengthen capitalism's resilience to the worsening *ecological crises*, occurring as biodiversity loss, climate destruction, heavy pollution and soil artificialisation. It would also protect, at least temporarily, the socioecological relations underlying capitalism from the *loss of legitimacy* and hence hegemony correlated with the crises (McCarthy, 2015; Ekers and Prudham, 2017; Ekers and Prudham, 2018). 'Green' capitalism is characterised by two interrelated dialectics reorganising, on the one hand, the forces and relations of production and, on the other, the cultural, political and ideological superstructures.

As a result of the first dialectic, forces and relations of production are reorganised suitably for expanding the accumulation frontier over unexploited or partially exploited ecosystem spaces, flows and stocks and transforming them into 'green' goods and services (commodities). The adjective 'green' indicates the latter's branding as potentially resolutive towards the ecological crises. This takes place through technological and organisational innovation, which entails the creation of entirely new industries.

This also requires the *incorporation* and *commodification* of the targeted ecosystem use values, through *mapping*, *valuation*, *enclosures* and *grabbing* (Vandergeest and Peluso, 1995; Corson et al., 2013). The targeted use values are situated in *places* or *areas* part of historically determined *socionatures* here defined as *territories*, which 'green' investments re-signify as *reservoirs of use values* and reconstruct as the *built environment* of *'*green' accumulation. The transformation of territorialised used values into, and their direct marketisation as, 'green' commodities enable the extraction and accumulation of surplus value. This is realised as either a *profit* or as a *rent,* in this last case by using 'green' commodities as a collateral. The extraction of value through territories is organised in *value-extraction chains*, which unequally allocate the value extracted to actors, classes and factions of a *territorially based alliance* depending on the power relations amongst them (Wallerstein, 2004b; Harvey, 2018b). A relatively low or null level of integration and a relatively scarce or null quantity of value redistributed to local capitals, factions of the labour class or local institutions can be useful to determine if a 'green' investment scheme, or the system of investments, is an *extractive enclave*.

Incorporation and commodification extend to socioecological relations living through territories as *territory grabbing*. This is a process whereby a territory, or places of it, is abstracted from its stratified historical identity, reduced to exchange value (actual or potential) and transposed as costs and revenues into the accumulation function of an investment scheme, to the benefit of factions of the capitalist class.

In expanding the accumulation frontier, 'green' capitalism and specifically 'green' investments serve as a *spatiotemporal fix* to capitalism's systemic drive towards overaccumulation crises (see Harvey, 2018b and subsection 3.4.3).

As a result of the second dialectic, cultural codes, political institutions, and ideological apparatuses are restructured primarily through the *detournement* and *re-functionalisation* of environmentalist claims and contestations potentially disruptive for enduring private accumulation and the social order underlying it (Azzarà, 2020; Hajer, 1997). Thanks to conceptual frameworks such as *natural capital*, *ecological modernisation* and *ecosystem accounting* 'green' capitalism has hegemonized alternative meanings of sustainability and has been asserted as the solution to ecological multiple crises (Mol and Jänicke, 2009; Costanza et al., 2014; Schumacher, 1973 and chapter 2). These frameworks have

performed a twofold function. They have reframed the urgency of mitigating the multiple ecological crises as an opportunity for more accumulation, this time painted in green. They also have posited capitalist accumulation, and the system of governance it implies, as the only possible solution to the crises (see subsection 3.4.3).

Basing on a combined analysis of the above two dialectics, it is possible to define 'green' capitalism as a *socioecological fix*. Besides contributing to stave off the risk of overaccumulation crises, as a spatiotemporal fix, 'green' capitalism discloses, at least theoretically, the possibility to mitigate aspects of the ecological crises through technological innovations, with substantial implications in terms of legitimation (see subsection 3.4.3). The outcome of 'green' capitalism as a hegemonic project depends largely on the cleavages internal to the capitalist class, and specifically on the success of 'fossil' capitalist factions' resistance to their hypothetical, yet possible, decline[18]. Theoretical elaboration and empirical analysis (see chapter 2, 3, 7, 8 and 9) indicate that should 'green' capitalism succeed as a hegemonic project, its pivoting on the perpetual accumulation of surplus-value based on the private ownership of the means of production is likely to reproduce patterns of inequality similar to historical capitalism (see McCarthy, 2015; Ekers and Prudham, 2017; 2018).

3.3 Capitalism without the green

This section takes the first step towards our analysis of *'green' capitalism* by focusing on capitalism *per se*. Following historical materialism, it shows that capitalism is based on the private ownership of the means of production. The section will present the most important categories of Marxist theory. Towards this purpose, it will particularly rely on quotations from Marx's works, making his categories dialogue with their interpretations by David Harvey. The section is organised into four subsections. The first explores commodities as objectified social relations. The second interprets capitalism through the socially necessary labour time theory of value. The third introduces the category of primitive accumulation and accumulation by dispossession. The last advances a definition of capitalism and introduces the related categories that are central this thesis.

[18] For a definition of 'fossil' capital factions see chapter 3 and Malm (2016).

3.3.1 A world of commodities

When an ecosystem space, stock or flow is *categorised* and *quantified* on a monetary equivalence scale and so *made exchangeable,* it can be intended as undergoing a process of *commodification*. Through it a windy mountain ridge or a forest, whose trees exchange oxygen for carbon dioxide, become a *commodity*, nothing more nothing less than a shoe or a chair. These apparently irreducibly different objects come to have something in common: they can be bought and sold for *money*. This makes them comparable and accumulable as *capital*.

According to Karl Marx commodities form "the wealth of societies in which the capitalist mode of production prevails" (Marx, 1976 p. 125). These "may be looked at from the two points of view of *quality* and *quantity* [emphasis added]" (ibidem). While quality is important for the determination of a commodity *use value*, which rests on the *principle of difference*, quantity is fundamental for the formation of *exchange value*, which is based on the *principle of equivalence*. If use values "constitute the material content of wealth" in any historical form of human society, in capitalism they also are "the material bearers" of exchange value (idem p.126). This appears as a "quantitative relation" (idem p. 148), implying that "use values of one kind" must "exchange for use value of another kind" (idem p. 154), regardless of the irreducible qualitative differences of the two kinds, which might be as different as apples and shoes, or cars and sofas. As commodity exchange expands, Marx explains, the "relative" exchange value, whereby a quantity of any commodity can be exchanged for a quantity of any other, is supplanted by "equivalent" exchange value. In this case, a commodity, or a set of commodities, is used as the *universal equivalent* (idem p. 160) against which all others are traded, or which -in a given proportion- buys everything. When a single commodity, (such as gold or silver by reason of their qualitative uniformity, durability and divisibility) emerges to be used as the *only* universal equivalent across the entirety of a society we are faced with the birth of *money*. This is the "uniform and universal form of value" of "all other commodities" (idem p.160). On this point, Harvey's explanation is particularly clarifying, when he notices that in pre-capitalist societies exchange occurs "between use values" (Harvey, 2018b p. 20). This form of circulation whereby commodities are sold for money, which is used to acquire other commodities, is defined by Marx as C-M-C. The existence of money is crucial in expanding exchange. By

making it possible to put a *price* tag on everything, money facilitates exchange as a *medium of circulation* and standard *measure of value*.

While money permits to solve the contradiction between use and exchange (relative) value, it so does only by embodying and universalising it. This is specifically related with the fact that the proportion and circulating velocity of money within society has to be balanced with the quantity of commodities exchanged at appropriate prices (Marx, 1976 p. 184; Harvey, 2018b p. 12).

Hence a variation, for instance, in the prices or quantities of commodities entails a variation in the demand for the money commodity, pushing its "reflex values […] to a level that may be far above its inherent value" (Harvey, 2018b p. 12). This would be a fairly easy problem to solve if the money commodity supply could be increased at will. Yet, money commodities, such as gold and silver, are scarce. It follows that economic agents in need of money can resort to two options. He or she can either accumulate a *hoard*, by saving money which so becomes also a *store of value* or borrow money from someone else who has hoarded it, sowing the germ of a *credit systems*. In both cases a new form of circulation arises from "the conditions of general commodity exchange" (idem p. 13). Unlike C-M-C which ends with commodities different from those at its start, this new form of circulation "begins and ends with exactly the same commodity" (ibidem), that is *money.* Here money is used to acquire commodities which then are sold to realise more money. At the core of this expansive process, which is synthetized as M-C-M1 or M-M^{I}, there is money in perpetual motion, that is to say *value in perpetual motion* or *capital*.

3.3.2 Labour and value

Now that we have succinctly explored what commodities, money and capital are, we are still left with a paramount question. We know that use values correspond to an object quality satisfying a socially determined need or want. We also know that a commodity can always be exchanged for a quantity of another. Since, as David Harvey explains, "putting two different use values (which are themselves qualitatively different) equal to each other in exchange implies that both use values have something in common" (idem p. 114), what is such an 'attribute' that make them quantitatively comparable -exchangeable? To answer this pivotal question Marx resorts to Ricardo's political economy. Following the British

economist and capitalist's *labour theory of value* (Ricardo, 1891), Marx finds that the "exchange relation of commodities is characterized precisely by its abstraction from their use-values", since "one use-value is worth as much as another" as long as they are in a quantitative relation (idem p. 127). Stripped of their qualitative specificities, commodities keep the "only one property [of] being *products of labour*" (idem p. 128). Commodities so appear as

> "[…] merely congealed quantities of *homogeneous human labour*, i.e. of *human labour-power* expended without regard to the form of its expenditure [emphasis added]. All these things now tell us is that human labour-power[19] has been expended to produce them, human labour is accumulated in them. As crystals of this *social substance*, which is common to them all, they are *values* - commodity value [emphasis added]" (ibidem)

In a C-M-C circulation form, a commodity is transformed into another through the obliteration of its use value, which gives way to that of the new commodity. Conversely, in a M-C-M form, commodities' use-value becomes totally irrelevant, and all that matter is the labour-power -that is the *value*- they embody, which can be accumulated as capital.

Value comes from "human labour in the *abstract* [emphasis added]" (ibidem) intended as "one homogeneous mass of human labour-power, although composed of innumerable individual units of labour-power" (idem p. 129). Marx uses the notion of *abstract labour* as a conceptual bridge towards his major innovation to Ricardo's theory, the category of *socially necessary labour-time*, which

> "[…] is the labour-time required to produce any use-value *under the conditions of production normal for a given society* [emphasis added] and with the average degree of skill and intensity of labour prevalent in that society" (ibidem)

[19] We should now observe that Marx distinguishes between labour and labour-power. As a temporary definition, wating for it to be refined in the next section, we will confine ourselves here to say that labour is the human capacity to purposefully transform nature so as to satisfy socially determined wants and needs. In spite of that Marx argues that labour has no inherent value. To support this statement, he uses the example of a machine. This is different and separated from the function it performs as labour is from labour-power, which "exists in the personality of the worker " (Marx, 1976 p. 678). Labour is the function of labour-power. The latter is the commodity that is actually owned and sold by labourers on the job market.

As Harvey notices, this is a far-reaching categorial innovation by Marx. First, it permits to historicize Ricardo's theory, recasting labour-power and labour-time as social categories dialectically related to the historical development of the production means and relations. And second, it entails a definition of value as a *social relation* specific to capitalism, and precisely that between abstract labour and capital, and therefore between labourers and capitalists. There is a caveat, though. "Human labour in the abstract" recalls Harvey, "can regulate commodity production and exchange only to the degree that a specific kind of human labour -*wage labour* [emphasis added]- becomes general" (Harvey, 2018b p. 15). In other words, the value carried by labour-power must be exactly quantifiable and for this to happen labour-power itself must become a commodity, with a standardised and average exchange value, expressed as a price, or better as a *wage* paid in money[20].

Like any other commodity, labour-power price (wage) corresponds to the cost of its production. In other words, labour-power price (wage) is equal to the "cost of production" of a worker (Marx, 1976 p. 678). To borrow Harvey's words, this is "the socially necessary labour time" needed to reproduce and maintain a worker "*at a certain standard* [emphasis added] of living and with a certain capacity to engage in the work process" (2018b p. 22).

However, the socially necessary labour time for a worker to produce a value corresponding to the wage paid is but a portion of the hours he or she actually works. The rest of the unpaid worked hours are defined by Marx as *surplus labour time*. During them the worker produces a *surplus value* appropriated by the capitalist who can realise it as a *profit*. The rate between total value and surplus value is defined as the *rate of exploitation*. Labour-power is that very special commodity that provides specific use-values, for instance warehousing, packaging or delivering, if we take logistics as an example, and simultaneously constitutes "the *universal value-creating element* [emphasis added], and thus possesses a property by virtue of which it differs from all other commodities" (Marx, 1976 p. 681).

[20] Consider that "average" indicates a value mean to every "units of labour-power" but also its material expression as money, which therefore becomes an inescapable precondition to perfecting the labour abstraction process, whose result is wage-labour (Marx, 1976 p. 129). All the categories that we have discussed so far should be considered in a dialectical interrelation. If they are regarded through a linear methodology, whereby concepts are introduced progressively, with one building linearly upon the other, the mutual relations of negation and synthesis, within history, characterising historical materialism's categories would become impossible. The category of wage-labour is a perfect point in case. It is the foundation of value accumulation in capitalism, but it could not exist without money, which itself is cause and a product of capitalism.

Capitalist value production and circulation, Harvey recalls, happen in "the context of definite social relations", dominated by "the social relation […] between capital and wage labour" (Harvey, 2018b p. 22). If wage-labourers only own their labour-power which they sell for a wage, capitalists is "any economic agent who puts money and use values into circulation in order to make more money" (Harvey, 2018b p. 21). It follows that not all the wealth existing in a society is "value in process, money in process, and, as such, *capital*" (Marx, 1976 p. 256).

From this perspective, capitalism appears as founded on an *unequal* and *extractive* social relation, crystalized in relations of production, whereby those who own the means of production but do not produce value, the capitalists, appropriate it from those who do not own any means of production except their labour-power and produce value, the labourers.

3.3.3 Primitive accumulation

If the socially necessary labour time theory of value clarifies how the extraction of surplus value and its accumulation as capital presupposes the consolidation of a wage relation, it still leaves some aspect obscure. Precisely, this is the historical dynamic whereby the capitalist class has established itself as the owner of the means of production, determining the formation of another class of subalterns selling 'voluntarily' their own labour-power. Marx's elucidates that by revisiting the category of "accumulation of stock" introduced by Adam Smith and playing a central role throughout classical political economy (Smith, 2010 p. 55). By this, the English economist and philosopher identified some sort of a-historic stage, when neither any division of labour nor land appropriation and concentration had yet taken place. In this idyllic moment, the labourer owned "the whole produce of the labour", so having "neither landlord nor master to share with him" (ibidem). This "original state of things" Smith explains "could not last beyond the first introduction of the appropriation of land and the *accumulation of stock* [emphasis added]" (ibidem). Analogously, Marx explains that since "the accumulation of capital presupposes surplus-value; surplus-value presupposes capitalist production; capitalist production presupposes the availability of considerable masses of capital and labour-power in the hands of commodity producers", the only way to avoiding assuming the "whole movement" as trapped "in a never-ending circle" is to posits the existence of a *primitive accumulation* of capital (Marx, 1976 p. 873).

Through this historical category Marx identifies a violent and centuries-long process, creating a "complete separation between the workers and the ownership of the conditions for the realization of their labour" (idem p. 873). Deprived from agricultural soil and liberated from serfdom or the restrictive labour regulations of the medieval guilds, an immense mass of men and women could become *free workers*. In other words, freed from the fetters of medieval social organisation and freed from "any means of production of their own" (idem p. 875), they became 'free' to sell their labour-power to capitalists. If "the historical movement which changes the producers into wage-labourers appears" (idem p. 874) as an emancipation from the subjugations inherent to the medieval social relations, on the other hand

> "[…] these newly freed men became sellers of themselves only after they had been *robbed of all their own means of production* [emphasis added], and all the guarantees of existence afforded by the old feudal arrangements. And this history, the history of their expropriation, is written in the annals of mankind in letters of blood and fire" (idem p. 875)

Primitive accumulation can be regarded as resulting from several interrelated processes: the concentration of land ownership and the creation of large-scale agriculture; the transformation of pre-capitalist forms of labour into wage-labour; the exploitation of slavery and other forms of forced labour (especially but not only in the colonies); and the progressive accumulation of a *capital stock* to be reinvested in the development of machinery and infrastructure. All of these processes presuppose the enclosing of land and the ecosystem use values located on it, which form the 'material conditions of labour'. From this perspective, primitive accumulation is first and foremost an *enclosure of nature*, that is ecosystem spaces, flows and stocks. By consequence, it is only by appropriating nature that labour can be controlled.

Departing partially from Marx's elaboration, other historical materialist thinkers further developed the category of primitive accumulation and extended it beyond capitalism's initial stage. A first substantial contribution came from Rosa Luxemburg, who argued that the "realm of *peaceful competition* [emphasis in the original]" (Luxemburg, 2015 p. 433), where accumulation takes place through labour exploitation goes hand in hand with "the realm of capital's blustering violence". This unfolds specifically in "the relations between

capitalism and non-capitalist modes of production" through "the predominant methods [of] colonial policy, an international loan system—a policy of spheres of interest—and war" (ibidem). On the existence of an "organic link" between the two realms David Harvey has built his analysis of neoliberal capitalism (Harvey, 2005b p. 175). He contends that the latter internalises violent accumulation methods using them not only as an instrument of imperialist expansion towards not-yet or peripheral capitalist contexts, but also within advanced capitalist societies. Harvey defines this on-going and internal variant of primitive accumulation as *accumulation by dispossession*, particularly referring to privatization, forced de-industrialisation, welfare dismantling (idem)[21].

We can conclude that accumulation by dispossession is "dialectically intertwined" (ibidem) with "expanded reproduction", that is to say sustained accumulation taking place once the wage-labour relation has been fully established. These two aspects of the "dual character of capital accumulation" (ibidem) can happen synchronically and contiguously. Moreover, they concern all forms of contemporary capitalism, even the 'green' ones. From this perspective, wide-scope accounting efforts of ecosystem services preluding to their privatisation (Corson, 2011), including the enclosures of lands through which renewable energy can be produced (McCarthy, 2015), can be interpreted as forms of accumulation by dispossession. This entails specific spatial dynamics which will be interpreted in the following chapter.

3.3.4 Capitalism and Capitals

In conclusion and basing on the above discussed categories of *commodity, money, capital, value* and *primitive accumulation,* we can propose a definition of capitalism as a historically situated mode of production based on the private and perpetual accumulation of surplus-value. To that purpose surplus-value is continuously hoarded and reinvested, so becoming *capital*. From this historical materialist perspective, surplus value is created by labourers which transform use values (or qualities) that nature provides into commodities with an exchange value (a quantity). By owning the means of production, the capitalist class can appropriate surplus-value from labourers who can only live by selling their labour. This

[21] For an account accumulation by dispossession actual impacts on people's everyday life see Hodkinson and Essen (2015).

'peaceful' accumulation process is accompanied by a more violent accumulation by dispossession, entailing the more or less explicit use of force to privatise ecosystem spaces, stocks and flows, as well as other portions of the social wealth, to be converted into capital.

Subordinated to the above definition, and the socially necessary labour time theory of value underlying it, are the several categories that will be used in the course of this thesis. They are presented in what follows.

If we focus on value, we can identify *variable capital* and *constant capital*. In the first category we find capital anticipated by capitalists to buy labour-power from labourers, by paying wages. As we have seen above variable capital offers the opportunity to appropriate *surplus value* and realise a *profit*. It follows that the capital invested in wages is *variable* because undergoes a *quantitative variation*. This variation is defined as *absolute surplus value*, realised as average profit, when it results from extending the working day duration. Differently, the variation becomes *relative surplus value*, realised as *excess profit*, when the rate between surplus value and total value is expanded without changing the working day length. This can be achieved by cutting wages, compressing living costs or increasing the *productivity of labour*, that is diminishing the time needed to produce a given quantity and/or quality of a commodity. Differently, constant capital includes "the raw material, the auxiliary material and the instruments of labour" (Marx, 1976 p. 317), whose value is assumed constant during the process of production.

If we take capital circulation as a perspective, labour-power, raw materials and auxiliary materials are defined as *circulating capital*. Differently, the instruments of labour become *fixed capital*. In effects, they "never leave the sphere of production, once they have entered it", since they are the "portion of the advanced capital-value" which "becomes fixed in [the] form determined by the function of the instruments of labour in the process" (Marx, 1967 pp. 160–161). It is also important to notice that while *variable capital* corresponds to *living labour*, as labour performed by living labourers, *fixed capital* embodies *dead labour*, or the labour expended to produce instruments, which crystallise the value produced by labour in an earlier moment.

In order to stay alive in the market, capitalists must at least realise average profits. Yet, if they want to reduce the risk of being driven out of business by competitors who

accumulate faster, they must keep up with competition. This translates into the need of realising ever larger excess profits. An easy way to achieve this is to increase productivity by improving their fixed capital efficiency. The gains they realise by innovating, tend to disappear as long as competitors adopt similar techniques and technologies. This in short is the reason why, according to Harvey, *technological change* is an *ephemeral fixture* for capitalists, who nevertheless are constantly driven to resort to it (Harvey, 2018b p. 31). On the other hand, monopolising access to an ecosystem space, flow and stock, - or a 'force of Nature' as Marx has it (Marx, 1976) - and enrolling them to a productive process, can serve as a *permanent fixture* (see subsection 3.3.2 and Harvey, 2018b p. 335).

Instruments that are incorporated into land represent a special kind of fixed capital. Amongst them we find all the immovable infrastructures needed for production, but also distribution, consumption and disposal to run smoothly. As Harvey advances, they form part of a *built environment* which

> "[…] functions as a vast, humanly created resource system, comprising use values embedded in the physical landscape [and which] has to be regarded as […] as *a geographically ordered, complex, composite commodity* [emphasis added]" (Harvey, 2018b p. 233).

The built environment includes other capital elements, such as *land capital*, the portion of fixed capital turned into agricultural infrastructure, as well as non-capital elements.

If we take the perspective of the activity field, we can distinguish amongst *industrial capital*, *merchant capital* and *interest-bearing capital* (see Marx, 1993 pt. 4). While the first is specialised in production and the second in exchange and circulation, the third operates in both spheres. Its accumulation process rests on the extraction of an *interest* from money or a financial asset. This kind of capital can accumulate an interest by specialising in investing and lending to production-related activities or to consumers, so facilitating overall capital circulation.

In this section we have investigated the categories of commodity, money and capital. We have defined the latter as value in motion and contended that it is created through the exploitation of wage labour. We have illustrated that the wage relation results from the privatisation of the means of production by capitalists, initially through primitive

accumulation. We have concluded the section by offering a definition of capitalism. How this combines with the 'green' as a restructuring of the relations of production and their legitimation will be taken up in the following section.

3.4 Capitalism with the 'green': a new story?

Having defined capitalism basing on the socially necessary labour theory of value, we can turn our focus onto investigating the possibility of a 'green' capitalism variant. As a departure point, we can notice that the mainstream TFGCs discussed in the previous chapter postulate the inclusion within capitalist production relations of ecosystem spaces, flows or stocks which are found to be not yet or 'inefficiently' commodified. The combined effect of an extended accounting of the ecosystem still 'untapped' potential (for accumulation) and a modernisation of productive cycles towards 'greener' technologies and production techniques would alleviate the ecological impact of perpetual economic growth, so boosting it. This would come as a result of regulatory and institutional reforms oriented by the principles of neoliberal governance and legitimised by a rationality building on the *emergency* to mitigate the socioecological crises through market *efficiency* (Mol et al., 2009; Dryzek, 2013). For such theories, not only is a capitalism's 'green' turn an actual possibility, but it is already an ongoing process.

What needs clarifying, however, is the meaning of the adjective 'green'. Considering the paradox of high economic performances of the 'green' sectors coupled with insufficient results in terms of ecological crises mitigation and, on the other hand, basing on the TGCS's conceptual assumptions, 'green' seems rather indicating an accumulation expansion over the 'green', that is over the ecosystem, promoted through suitable rationalities and regulations. We can consider this as a preliminary working definition of '*green' capitalism* which will be further expanded throughout the following subsections. The first of them discusses the philosophical foundations of the nexus between nature, labour and surplus value accumulation. The second explains the mediating, regulating and creative relationship between human labour and nature materiality, investigating 'green' capitalism revenue patterns and class relations. The third frames 'green' capitalism within historical materialist theories of crisis, focusing specifically on the category of *spatiotemporal fix* and *socioecological fix*, from the perspective of the Gramscian theory of hegemony.

3.4.1 The dialectical unity of nature and labour. A Hegelian explanation

What is the relation of 'green' capitalism with nature and how is that different from 'normal' capitalism? We will address this question by consulting the philosophical system that is foundational to Marx's historical materialism: Hegel's dialectical idealism. Three are the relevant categories. The first is the *dialectic* as both an ontological and gnoseological category. While this lies at the heart of Marx's philosophy of history (see below), it offers important clues towards the question we are addressing. The second is that of *second nature*. It allows to fully comprehend the relation between nature and society, and so prepares the ground to the discussion of Neil Smith's theory of *production of nature* in the next subsection. The third is the *bondsman-lord dialectic*. This is decisive to the comprehension of Marx's philosophy of history, shedding light on the nexus between the enclosure of ecosystem spaces, flows or stocks, the privatisation of the means of production and the perpetuation of capitalist relations of production.

Our point of departure is an apparent contradiction in Marx's theory of value and the doubts it raises. If labour is the universal source of value, on the other hand, it is not "the source of all wealth". Marx makes this point in a late work, the "Critique to the Gotha programme" (2009a p. 1), specifying that

> "Nature is just as much the source of use values (and it is surely of such that material wealth consists!) as labour, which itself is only the manifestation of a force of nature, human labour power" (ibidem)

As Marx explained in the first volume of Capital, *wealth* or better *material wealth* is equivalent to the entirety of use values, including those "provided in advance by Nature" and those produced through the labour process. This is composed of "simple elements", such as a "purposeful activity, that is [labour] itself, […] the object[22] on which that [labour] is

[22] *Object of labour* [*Arbeitsgegenstand*], also translated as *subject of labour* is the entity to which labour is applied. Marx's own words can help clarify: "the land (and this, economically speaking, includes water) in its original state in which it supplies man with necessaries or means of subsistence ready to hand is available without any effort on his part as the universal material for human labour. All those things which labour merely separates from immediate connection with their environment are objects of labour spontaneously provided by nature, such as fish caught and separated from their natural element, namely water, timber felled in virgin forests, and ores extracted from their veins. If, on the other hand, the object of labour has, so to speak, been filtered through previous labour, we call it raw material. For example, ore already extracted and ready for washing. All raw material is an object of labour, but not every object of labour is raw material;

performed, and […] the instruments of that [labour][23]" (Marx, 1976 p. 133). Beyond these few certainties, we are unsure about whether there is a clear demarcation between labour and nature in the creation of material wealth, and -by extension- between labour and nature in the formation of society, that is to say between society and nature. It is here that our digression through Hegelian dialectical idealism begins.

In a mechanistic -we can Say Cartesian- perspective, the separation between nature and society is sharp and follows the strict rules of an Aristotelian linear logic based on the principle of (non) identity: A=A thereby A≠B. This puts society, the fruit of the Cartesian *cogito*, at one end and nature at the other. Along a similar line Kant's *Reason* is clearly dichotomised from causal nature (for a comprehensive discussion see Abbagnano, 2003). Hegel's philosophy breaks this barrier and puts the *subject*, the *Idea*, in a dialectical relation with the *object*, *Nature*, from which a new, self-conscious, comprehensive, *subject* arises, the *Spirit*. First, we can observe the *Idea-in-itself*, that is the totality of the logical determinations of what is real. As its absolute character becomes negated -alienated- in the finitudes of *space and time*, it turns into the *Idea-for-itself*. Through a further negation, that is bound to be overcome by a new superior subject, which includes the initial subject, the *Idea-in-itself*, and its opposite, the *Idea-for-itself*. Now the *Idea* has so returned to itself as *Spirit*, that is the humans as self-determined beings. They embody *Nature's* spatiotemporal finitudes, as mortal animals, and their opposite, that is the absolute character of the *Idea*, visible in spiritual products, such as the laws, art or philosophy. Hegel explains in the Phenomenology of Spirit that *the real* must not be thought as something external to the subject, as an alterity, a separated object, but rather as something indissolubly interwoven with it (Hegel, 1977). His intent was to depart from previous metaphysical traditions, which hypostatised the *absolute* relegating it to a perfect empyrean of which the real was but a rather imperfect or perfectible reflection. To the contrary, as we have seen, the real is composed of both the absolute and its negation, that is the finite phenomenal

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the object of labour counts as raw material only when it has already undergone some alteration by means of labour" (Marx, 1976 p. 284).

[23] According to Marx: "an instrument of labour is a thing, or a complex of things, which the worker interposes between himself and the object of his labour and which serves as a conductor, directing his activity onto that object […] Leaving out of consideration such readymade means of subsistence as fruits, in gathering which a man's bodily organs alone serve as the instruments of his labour, the object the worker directly takes possession of is not the object of labour but its instrument. Thus nature becomes one of the organs of his activity, which he annexes to his own bodily organs" (Marx, 1976 p. 285).

manifestations. This explains Hegel's famous statement according to which "The truth is the whole" where A^{I}= (A; B). The *absolute* therefore exists as the *becoming* of a dialectical process, through which the *subject* uncovers its own objectivising character through *history*. It is exactly this process of self-fulfilling, that is processual self-revelation, that implies the correspondence between the dialectics as an ontological law, positing the absolute as a becoming, and the dialectics as a logical law that permits to *know* it as a becoming. Hence, history *is* a dialectical *becoming* where the *abstract* (Idea-in-itself), through *negation* (Idea-for-itself), becomes *concrete* (Idea-in-itself and for-itself), and so on. The Hegelian dialectic *becomes* through an endless positing of antitheses, or determinate negations, and their resolution, or sublation [*aufhebung*], into new synthesis. In short, *the real* is a synthesis of opposites. Without *negating* certain parts of itself, the *Idea-in-itself* would remain an undefined *totality* that is a *nothingness*, causing the finitudes of nature and history to be impossible. A basic example for that is *life as becoming*, a synthesis of living and dying in a simultaneous process (Abbagnano, 2003; Houlgate, 2005; McKenna, 2011).

We can now introduce the Hegelian category of *second nature*. In Hegel's own words, this is the "immediate being of the soul" which is both an *immediacy* arising from senses or feelings and, and its negation, a *mediacy* inherent to the "determinacies of representation and of the will". Thanks to this, humans can *interiorise* habits as if they were natural mechanisms, pushing them to the sphere of needs and so *free* the soul "to other activity and occupations" (Hegel and Inwood, 2007 sec. 410 R)[24]. Habits range from relatively simple faculties, such as walking, to complex and refined activities, such as piloting a plane or painting. In fact, they are "the most essential feature of the existence of all *spiritual* life" (ibidem). Hegel establishes a continuity between simpler habits pertaining merely to the inner individual life and other characterising the external social life (Lumsden, 2016). By transforming an act of the will -stimulated by a sense or feeling- into a *natural* automatism, habit formation can lead "religious content, moral content, etc., to belong to [the spirit] as *this* [emphasis in the original] self […] in its very being" (ibidem). In other words, habits form into custom and values of a culture, which are transmitted through education, a process through which cultural and societal codes are inscribed within individuals. In fact,

[24] In all Hegel quotations, 'R' abbreviates *Remark*, while 'Z' abbreviates *Zusatz*.

although a produced nature, second nature is "still a nature, something posited that assumes the shape of immediacy" and therefore "something not corresponding to free spirit" (Hegel and Inwood, 2007 sec. 410 Z). From this perspective, cultural codes as historical superstructures of a mode of production become a second nature to which humans respond.

The category of *second nature* is fundamental in understanding Marx's interpretation of *society* and *nature* through *history*. However, that is so only if second nature is interrelated with another Hegelian category, that of *recognition* within the *bondsman-lord dialectic*. Through this, Hegel explains the foundation of society and history as the alienation of humans from *the state of nature*, triggered by the desire to "raise their certainty of being *for themselves* to truth" (Hegel, 1977 p. 114), that is breaking the bonds with, and becoming independent from, natural causalities. A "self-consciousness", as Hegel explains, "exists *in* and *for* itself when, and by the fact that, it so exists for another; that is, it exists only in being *acknowledged* [emphasis added]" (idem p. 111). The mutual and equal recognition, though, can only happen as a result of a dialectical process, which is defined as the *lord-bondsman dialectic*. Hegel illustrates that through a myth. At first, there are two equal individuals, or *self-consciousnesses,* which desire "to become certain of itself as the essential being" (ibidem). To achieve that means for each "to supersede the other" and seek "the death" of the other (ibidem). Nonetheless, intended by each as a way to affirm their own self-consciousness, the death of *the other* would erase any chance of success of mutual recognition and hence of a self-consciousness affirmation. Things change when one of the two, fearing for its own life, accepts to subjugate itself to the bondage of the other so to stay alive. Through this mediate negation, the process of recognition is maintained. A lord is now recognised by the bondsman as a *pure* self-consciousness, while the bondsman only lives as a reflection of the lord, being an "immediate consciousness, or consciousness in the *form of thinghood*" (idem p. 115). Not only is the bondsman a thing, but he is also left to relate with *the thing*. In other words, the bondsman is forced to manipulate the material world so to ensure to the lord the *enjoyment* he or she seeks, but for which he or she does not want to work. *Labour* is therefore imposed to the bondsman's "discipline of service and obedience" (idem p. 119). Gradually, however, the lord realises that he or she is recognised by a self-consciousness, that of the bondsman, which "is not an independent

consciousness, but a dependent one" (idem p. 117). So, the lord becomes unsure about the essentiality and independence of his or her own consciousness. It is clearer and clearer to him or her that he or she is a dependent consciousness, since he or she needs the bondsman's labour for the satisfaction of his or her desire. To the contrary, the bondsman by establishing a manipulative relation with the material world through labour which "forms and shapes *the thing* [emphasis added]", becomes conscious of "*his* own independence [emphasis added]" (idem p. 118). The conclusion is as simple as revolutionary: "Through this rediscovery of himself by himself, the bondsman realizes that it is precisely in his [labour][25] that he acquires a mind of his own" (ibidem). If the *struggle for recognition* breaks the subjugation of *first nature* over humans, it is only labour that elevates the *bondsman-lord dialectic* to a *recognition amongst equals*, so realising -negation by negation- absolute freedom, as a form of universal self-consciousness or *absolute spirit*.

Armed with the three Hegelian categories discussed above, we can draw some preliminary conclusions on the relation between nature and capitalism.

First, under capitalism the private ownership of the means of production, as both a cultural and juridical objectification of capitalism's relation of production, becomes a *second nature* inscribed in cultural codes, societal norms, and political institutions, especially for the subaltern classes. As Marx explains

> "The advance of capitalist production develops a working class which by education, tradition and habit looks upon the requirements of that mode of production as *self-evident natural laws* [emphasis added]." (Marx, 1976 p. 899)

By interiorising private ownership as a natural, therefore moral, fact, the workers interiorise that very device that make them "the slave of other men who have made themselves the owners of the *material conditions of labour* [emphasis added]" (Marx, 2009a p. 1).

Second, as we learn from the *bondsman-lord dialectic* labour is the only activity through which humans can fully realise and free themselves. If the conditions of labour depend all indissolubly on nature which provides all use values, including labour-power, we can

[25] The word *work* was here replaced with *labour* in order to ensure the terminological consistency of the text.

deduce that controlling nature translates necessarily into controlling labour and establishing class domination. Basing on this, the expansion of capitalist relations over not yet or 'inefficiently' commodified ecosystem spaces, flows and stocks inherent to a 'green' capitalism inevitably extends class domination pushing further away the possibility of a society of equally free members.

3.4.2 The production of nature

On the Hegelian dialectics Marx built his theory of *history* and, therefore, capitalism. Yet, Marx criticised Hegel's idealism, branding it as a "mystical shell" (Marx, 1976 p. 103). He contended that idealism was wrong in positing the *Idea* as "the creator of the real world" and, consequently, the real world as "the external appearance of the idea". If the dialectic "rational kernel" is to be discovered, "it must be inverted" (idem p. 102), he maintained, since

> "The ideal is nothing but the material world reflected in the mind of man, and translated into forms of thought" (ibidem).

In short, it is by applying the very principle of *determinate negation* that Marx turns Hegel's *dialectical idealism* into a *dialectical and historical materialism*.

According to this philosophical tradition, as we have seen in chapter 1, society and history begin only when humans start to purposefully and socially produce their material existence through a sensuous and manipulative activity: *labour*. It is through it that the "material world" is "reflected in the mind of man" and *assimilated* to human needs and wants. Indeed, to explicitly answer the question at the start of this section, we can argue that through labour humans transform nature in "the source of all wealth" (Marx, 2009a p. 1).

If from this perspective there cannot be *history* without labour, labour also connects humans and nature in a dialectical unity rather than separating them, since it is

> "a process by which man, through his own actions, *mediates*, *regulates* and *controls* the *metabolism* between himself and nature [emphasis added]. He confronts the materials of nature *as a force of nature* [emphasis added]. He sets in motion the natural forces which belong to his own body, his arms, legs, head and hands, in order to *appropriate* the

> materials of nature in a form adapted to his own needs [emphasis added]" (Marx, 1976 p. 283)

As a "purposeful activity aimed at the production of use values" (idem p. 290), labour is "the everlasting nature-imposed condition of human existence […] common to all forms of society" (ibidem) which makes possible "human life itself" (idem p. 133). And along this line of argument, we can see why "technology", the objectified form of labour, "reveals the active relation of man to nature, the direct process of *the production of his life* [emphasis added]" (Marx, 1976 p. 493).

Throughout history, labour mediates the dialectic between society and nature into distinct *modes of production*, which also condition "the social, political and intellectual life process in general" and therefore the "definite forms of social consciousness" (Marx, 1911 pp. 11–12). Seen from here, every mode of production appears as a historically situated *ecology*, intended as a way of organising nature (Moore, 2017; 2015), simultaneously involving specific "forms of social consciousness" (Marx, 1911 pp. 11–12).

Yet, labour's manipulative power is not unidirectional, but rather reflexive, since through it "man acts upon external nature and changes it, and in this way he simultaneously changes his own nature" (Marx, 1976 p. 283). The dialectical 'specularity' between the "human essence" and the "natural essence" is both an *ontological* and a *logical* principle (Marx, 1959 second manuscript)[26], informing history and the possibility to understand it.

A substantial contribution to comprehending the dialectic between nature and labour, therefore society, under capitalism is offered by Neil Smith's thesis about the *production of nature* (Smith, 2008). Smith notices that although

> "in its ability to produce nature, capitalism is not unique [because] production in general is the *production of nature* […] where capitalism is unique is that for the first time human beings produce nature at a world scale" (Smith, 2008 p. 77).

[26] This is Marx's position expressed his earlier work, the "Paris Manuscripts". Although at the time he had not yet undertaken a thorough critical analysis of political economy, he had already laid the basis for the foundation of a dialectical materialism out of Hegel's idealism. At this stage his thought still retains evident element of essentialism and naturalism, which will later be fully framed within his philosophy of history.

With pre-capitalist modes of production *untouched* first nature hosted increasingly larger clusters of produced nature (and space). Conversely, capitalism's unquenchable expansive appetite underlain by an immense development of productive forces has made it necessary and possible to metabolise all nature into capital, progressively transforming the entire globe in the stage for accumulation. As Smith contends, resorting to Hegelian dialectic without mentioning it, "the generalization of the capitalist relation with nature" implies "the practical unification of all nature in the production process" (idem p. 72). In effect,

> "the ability of capital to produce the material world «in its own image» […] makes the *production of nature* [emphasis added], not the first or second nature in themselves, the *dominant reality* [emphasis added]" (idem p. 83)

Yet, as Smith explains, "*the production of nature* [emphasis added] is only possible given the identification and application of *natural laws* [emphasis added]" (idem p. 83). In other words, by investigating and understanding nature's *biophysical substratum* that remains *given*, as physics laws or biochemical processes are, it is possible to produce it, that is to adjust it to *socially determined needs and wants*. To clarify the difference between the two, we should look at the difference "between what can and what cannot be *destroyed* [emphasis in the original]" (idem p. 83). As an example, Smith compares the natural law of gravity and capitalism's socially determined law of value. While the first can be opposed through technology, such as airplanes, but cannot be destroyed, the second can be opposed and destroyed as long as the social relations underlying it are transformed.

The *production of nature* is observable in many respects. A first and most important is the *naturalisation* of wage labourers as mere instruments of accumulation. Originating from the *separation* of producers from means of production, labour *alienation* takes place as both the parcelling of the production process into segments and the standardisation of workers' skills. This is strictly related to the *naturalisation* of the private family where the costs and burdens of reproduction are offloaded on labourers and specifically on women (idem p. 74). To be sure, the production of nature takes place also as processes transforming ecosystem more-than-human materiality. In this case we should differentiate amongst pursued process; unwanted effects directly related to pursued processes; and unwanted effects indirectly related to pursued processes. In the first group we find commodity

production, which, as seen above, embeds exchange value within use values from the ecosystem. Spatial alterations as a consequence of expanding capitalism's built environment are classifiable under the second group. Finally, part of the third are all those processes, such as the ecological crises, caused by capitalism's social relations in their entirety.

3.4.2.1 'Green' accumulation between profit and rent

The theory on the production of nature presupposes a radical change in the relationship between use-value and exchange value. As Neil Smith explains

> "Under capitalism […] the role of exchange-value is no longer merely one of accompanying use-value. With the development of capitalism at a world scale and the generalization of the wage-labor relation, the relation with nature is before anything else an exchange-value relation." (Idem p. 77)

This appears even more so with the TFGCs (see chapter 2), which assume the whole of the ecosystem as a collection of tradable spaces, flows or stocks. Correlated to them are core 'green' industries such as renewable energy generation, carbon trading or waste disposal. If we look at them, we can observe how they all *valorise* some function or segment of nature's *biophysical substratum*, on which not any social labour process has been performed. In fact, the wind blowing on a mountain ridge, a forest exchanging oxygen for carbon or a seed's capability to germinate within the soil are *given* and remain *unproduced* by social labour (Harvey, 2018b). Seen from this perspective, their *tradability* poses serious interpretive problems vis-à-vis the socially necessary labour time theory of value. Provided that ecosystem spaces, flows and stocks can be traded as long as they have an *exchange value* underlain by a *value*, how can they have one without being produced by social labour, which, -recall- is according to Marx the only and "the universal value-creating element" (1976 p. 681)? And therefore, how does Smith's theory on the production of nature combine with the socially necessary labour time theory of value? Answering these two questions is propaedeutic to any analysis of the revenues that 'green' investments generate.

As an initial consideration based on the socially necessary labour time theory of value, we can notice that ecosystem flows, stocks and spaces on which *fixed* and *variable capital* has been applied reflect -at the very least- the value of the latter. Yet at a closer look, the

answer appears insufficient. A windy mountain ridge, or a carbon-sequestrating forest or a fertile land can be sold even without, or regardless of, applying any instrument, infrastructure or labour. In other words, the revenue generated by investments on *unproduced* ecosystem spaces flows and stocks cannot be assumed as composed of only profit on capital. As it will be shown in what follows, the impasse can be solved by positing the existence of a further revenue source: *ground rent*[27].

3.4.2.2 Unproduced nature as a permanent fixture

But let us proceed step by step and try first to clarify the functions that different types of unproduced ecosystem spaces, flows and stocks perform in accumulation. As seen above, the ecosystem provides all the objects or instruments of labour, or their precursors. "As the earth is [man's] original larder" Marx declares "so too it is his original tool house" (Marx, 1976 p. 285). Quite trivially, the "tool house" can only be accessed through land, which not only underpins, as space, "all production and all human activity" (Marx, 1993 p. 774), but also provides all use values that labour transforms into capital. From land, materials can be extracted, thanks to it abiotic flows or ecosystem services put to use, through it food produced. In other words, three types of material exchanges happening through land and implying the exploitation of an unproduced ecosystem function or segment can be identified, such as: extraction of materials, provision of abiotic or biotic flows and agriculture. In the first case materials are extracted and conveyed to the economic sectors that demand them. Here the original use value provided by land is the very presence of an ore deposit, which can be then transformed into -for instance- tradable gold or coal, by mining it -that is applying labour on it, so turning it into a commodity embodying miners' work. In the second case a "free natural power" (idem p. 879) can be immediately incorporated in production as a functional flow through the application of labour and fixed capital. If we take the example of wind energy plants, we can easily see how wind kinetic energy is translated into electricity, a tradable commodity. In both cases, the use values taken from within the earth or exploited thanks to land need processing through a combination of living and dead labour (see section 3.3.4). Whenever land is used in any of those ways, following Harvey (Harvey, 2018b), we define it as a *condition of production*. Different is the case of

[27] Rent on land without any improvements thereon (see Harvey, 2018b).

agriculture or better *agricultural and forestry soil*. Agricultural and forestry products result from a process happening naturally within the farmed soil. Furthermore, we must consider that agricultural labour with mechanical and chemical instruments or genetically engineered plants used to improve soil fertility and productivity can become incorporated within the soil or the plant, as a permanent feature. If we take the cultivation of genetically engineered crops as a method to increase productivity, they offer an example of how a *produced technique* can be embodied permanently into an organism or ecosystem, so as to adjust its life cycle to accumulation requirements. The same applies to methods directed to the soil itself. If we take the example of terracing, we can observe that thanks to it impervious mountainous lands can be turned into fertile farmable patches in the long term. In the final analysis, agriculture can be regarded as one of the first activities through which humans have produced nature. On this ground, Harvey contends that agricultural soil is to be classified as a *means of production*, asserting plainly that

> "Agriculture is somewhat special. The land here not only supplies a stock of nutrients to be converted by plant growth and animal husbandry into food and sundry raw materials, but it also functions as an *instrument or means of production* [emphasis added]. The production process is *partially embodied* [emphasis added] within the soil itself"[28] (Harvey, 2018b p. 334)

The ecosystem spaces, flows and stocks considered in any of the cases above are all *non-reproducible*. For this very reason, they serve as "a free gift of Nature to capital" that is to say "a free gift of Nature's productive power to labour" (Marx, 1993 p. 879). Harvey explains that

> "The use values in and on the land […] vary greatly as to their quantity and quality. The physical productivity of labour power therefore varies according to natural circumstances […] *Relative surplus value (excess profits)* [emphasis added] can accrue to capitalists with access to use values of superior quality – easily mined mineral resources, powerful 'forces of nature' or land of superior natural fertility" (Harvey, 2018b p. 335)

[28] For a very similar reason, animals bred to produce food or other materials can be considered as means of production.

As anticipated above (section 3.3.2), excess profits from technological change are *ephemeral* since competition tends to equalise technological progress within specific sectors and across the whole economy. Differently, any of the earth's use values "of superior quality" (ibidem) cannot be "significantly augmented or diminished by human agency" (ibidem p. 344). Therefore, they grant a *permanent fixture* to the problem of disappearing excess profits and therefore a stabler competitive advantage. Both Marx and Harvey use the example of the waterfall to explain that. A capitalist controlling a waterfall can use it to power his or her own machinery. He or she will so benefit from an energy cost permanently lower than a competitor who powers his or her machinery by a fossil fuel (coal for instance) bought on the market. The renewable energy sector is a further illuminating point in case. We can refer to both case studies of this research. The control of either windy mountain ridges or energy-crop cultivations –in presence of the appropriate labour and technological conditions- would allow a capitalist who converted them into energy to secure an advantage, which would be even greater for those seizing hold of ridges or agricultural plots with a productivity above the average. Recall, each of earth's use values provides a different permanent fixture by reason of its functional specificities, or *qualities*. Wind speed and steadiness is different than soil fertility or solar radiation intensity. This is not the only difference. Areas with a comparable windiness or soils similarly fertile can be located in more or less easily accessible places, with different, this time quantifiable, impacts on costs. Even with geographical accessibility being the same, social or bureaucratic conditions may vary. All these factors boil down to a conception of *relative space* upon which the *intensity* of the benefit derived from the fixture depends.

3.4.2.3 'Green' accumulation and financialised nature

What still remains unclear is the origin of the exchange value and value of land, and the ecosystem flows or stocks it gives access to, on which not any labour process has been applied, which we will call *raw land*. The exchange value of a raw land parcel is as real as the fact that its owner can realise immediately and entirely it by selling the parcel and so relinquishing its ownership. He or she could also use the landownership (hence its exchange value and value) as a collateral to calculate a *ground rent*, so as to extract a regular revenue from the parcel while retaining the ownership itself. Nonetheless, real as the parcel exchange value may appear, since there is no labour-produced value underlying it, our

historical materialist framework of reference suggests that the parcel only has a *fictitious exchange value*. The adjective *fictitious* was used by Marx to define *fictitious capital* and indicate the latter's capability to earn its owner a financial rent only underlain by a claim on productive processes *yet to occur*[29].

This entails that a capitalist buying or renting a raw land parcel has a *reasonable and rational expectation* that the use values on the parcel can be turned into a permanent fixture and originate excess profits *in the future* (Harvey, 2018b). In a situation of this sort, raw land is treated as a pure commodity and, as Marx explains

> "it functions in [the capitalist's] account as *interest-bearing capital* [emphasis added], since he reckons the income he receives -as rent from the land or as debt interest from the government- as interest on the money that it cost him to purchase the title to his revenue" (Marx, 1993 p. 946)

Along a similar line of reasoning, Harvey maintains that under capitalist relations, "land becomes a form of *fictitious capital*" which is nothing more nothing less than a "a pure financial asset which is bought and sold according to the rent it yields" (Harvey, 2018b p. 347) . And exactly like a government bond or a corporate share, land carries a value not underlain by any actually occurred productive process, which is therefore *fictitious value*. In land transactions

> "what is traded *is a claim upon future revenues*, which *means a claim upon future profits* from the use of the land or, more directly, *a claim upon future labour* [emphasis added]" (Harvey, 2018b p. 347)

Now that we have come to an answer to the first of the initial questions and clarified the rentier character of investments on unproduced ecosystem spaces, flows or stocks, we can delve deeper into their revenue structure.

[29] Karl Polanyi also used the adjective to identify objects that are unproduced or not produced for the market but still traded as if they were, terming them *fictitious commodities*. Within this category the Polish thinker included land, labour and money explaining how capitalism, that he calls the market economy, dis-embeds them from the socio-historical context from which they originate, and re-embeds them within market as mere objects of exchange (Buğra et al., 2007).

3.4.2.4 'Green' capitalism as a rentier regime

If we now consider rent on land with improvements thereon, we can define it as land that has been fully or partially transformed into *a built environment*. As seen above, according to Harvey, the latter is a "geographically ordered, complex, composite" (idem p. 233) object resulting from the merging of fixed capital, space and nature's use values for the purpose of enabling production, distribution or consumption and which so becomes a sort of *super* instrument, or a produced nature and space *a la* Smith. Investigating such an object allows to identify the rent components combining with ground rent.

To the purpose, we can use again the example of renewable energy production. If we take the case of a wind energy plant, we can easily regard it as a built environment for renewable energy production, composed of instruments and infrastructures incorporated in a land plot and developed around wind kinetic energy. The wind plant will earn the owner a ground rent determined by land and wind characteristics proportionally. If the land is easily accessible in terms of communications routes and, on the other hand, the winds blowing on it offer productive anemometric features, revenues will be expected to be higher and the ground rent set accordingly -provided all agents have equal access to information. The plant will also earn a rent (interest) on capital, that is on wind turbines and other infrastructures. This reflects a claim on the future revenues that the renter capitalist will realise by producing renewable energy through it.

There is a caveat, however, which directs our discussion towards a third rent component. So far, we have implied that the average price of energy production is higher than that for generating wind energy. In reality things stand at the opposite. In fact, rarely do wind energy plants reach the *grid parity* with conventional energy sources[30]. It follows that they are often unprofitable and therefore pointless vis-à-vis capital accumulation. The gap can only be filled through an exogenous capital inflow by an external entity, that is the state. It may raise the necessary liquidity through taxes and channel it to capitalists, for them to produce renewable energy. This value can be distributed in the form of monetary

[30] According to Gu Choi et al (2015 p. 718) grid parity is generally defined as: "the time point at which the decreasing cost of electricity from a renewable energy technology due to its technological advances intersects the cost of electricity generated from conventional fuels, such as coal and natural gas, and it is generally thought that, without any subsidies, a renewable energy technology will have cost-competitiveness in the market when the technology reaches the 'grid parity' point".

subsidies, with the legitimation of decarbonising the ecosystem, a higher and general good. Besides enabling the exploitability of a use value, in this case wind kinetic energy, otherwise unusable under capitalism's relations of production at a given technology historical stage, subsidies can be considered as a specific type of rent on fixed capital, paid by the state on privately-owned fixed capital used to produce renewable energy, with the legitimation of mitigating the climate crisis. By implication, they serve as a claim on future revenues, in this case a claim on public money transfers paid for a length of time[31], known in advance and set in binding terms. To be sure, what will be reflected in the final rent is the subsidy portion yet to be paid out. That alongside rent on fixed capital (additional to that paid as subsidies) and ground rent will form a final a *composite rent*.

In light of all the above considerations, we can now advance an answer to the second of the questions posed in the previous subsection, as to how to reconcile Smith's theory on the production of nature and the socially necessary labour time theory of value in the ambit of 'green' investments. Regardless of either the persistence of immutable natural laws or the exploitation of unproduced ecosystem flows or stocks, the innate capitalism drive to universalisation and abstraction *produce,* that is initially to *signify* the entire nature, including human society, as the stage for accumulation. From this perspective, the *reality* is potentially bound to be *entirely financialised*, that is attached a *fictitious exchange value* and earn a *rent,* that is an *interest,* as a claim on future appropriations, that is on future labour. This does not preclude that financialization may also lead to *material alterations*, that is a material production of nature. In this sense all nature is *immaterially and materially produced* as an object of capital.

After investigating the relation between nature's use value and labour-created value, we are now equipped to investigate the class relations that all this entails.

3.4.2.5 Rent, profit and class relations

Harvey argues that "landownership has achieved its true capitalistic form" (idem p. 347) only when land is treated as a financial asset. Yet, in reality an array of intermediate forms exists, especially when a new wave of accumulation and investments penetrates geographies with a marginal role in the division of labour at national or higher levels. This is

[31] Usually, subsidisation periods range from 10 to 20 years.

particularly visible with renewable energy generation. Since renewable sources have a scarce power density (Smil, 2008)[32], their production is intrinsically decentralised, dispersed in plants most often located in rural regions. In fact, the latter's peripherality to capitalist centres may imply that land and landownership have only partially achieved their full capitalist form (Harvey, 2018b p. 345 and following).

This interplays in complex ways with class relations between investors and landowners, as these relations depend largely on the existing landownership regime, the macroeconomic context of specific geographies and the access to information. In geographies characterised by a combination of socio-economic marginality and a fragmented landownership regime the average land rent may be cheaper as a consequence of a weaker landowners' bargaining power. Moreover, the character and profitability of the investment might be obscure to landowners, preventing them from increasing land prices accordingly. With a weak bargaining power, it is likely that landowners become trapped in some sort of "adverse" incorporation (Hickey and Du Toit, 2013). In such circumstances they may perform a substantial function to a 'green' investment scheme or value chain, while receiving unproportionate small fractions of the extracted value as a consequence of the actual power relations.

Different is the situation where a socio-economic marginality is coupled with a concentrated landownership regime. In this case landowners' bargaining power might be stronger, yet still dependent on the level of information they access.

A thorough, empirical discussion on this is conducted in chapter 7 and 8 as part of the analysis of our two case studies.

3.4.3 The fixes of 'green' capitalism as a hegemonic project

Having interpreted the mechanisms through which surplus value is extracted in and around 'green' investments exploiting unproduced ecosystem spaces, flows or stocks, it is now possible to open our investigative attention to the role 'green' capitalism may play in the overall reproduction of capitalist social relations. To this purpose, we will first analyse

[32] An energy carrier's power density can be defined as its rate of energy flow (power) per unit volume, area or mass.

'green' capitalism through Harvey's historical materialist theory of capitalism's crises. We will then introduce the category of *spatiotemporal fix* and apply Gramsci's theory of hegemony.

Historical materialism concedes that capitalism has allowed to develop the forces of production to an unprecedented efficiency in human history. Nonetheless, their organisation under a private ownership regime for the pursuing of equally private profits is deemed responsible for the *irrationality* of this mode of production, as evidenced by its cyclical crises. While damaging or even destroying capitalism itself, and therefore capitalist classes' capacity to accumulate, those crises could in fact undermine the socioecological relations that support it, that is the ecosystem and society as such. In Marxian terms, capitalism is doomed to an irremediable contradiction between forces and relations of production. On these premisses, historical materialist scholars have developed a copious literature investigating capitalism crises[33]. If we were to identify a red thread connecting these works, this would be a tenet shared with classical political economists, such as Smith, Ricardo, Malthus and Stuart Mill, maintaining that capitalism in the long-term tends to plateau on a null accumulation state. Nevertheless, differently from the latter, historical materialist scholars understand crises as endogenously caused by capitalism's contradictions and indeed strictly related to capitalism's law of value, rather than caused, as classical and neoclassical

[33] Historical materialist debate on capitalist crises can be divided into three different analytical strands. The first strand, known as "profit squeeze", focuses on the relation between labour organisation and surplus-value extraction. Its major tenet is that a combination of successful class struggle and labour scarcity would push wages to a level so high as to erase any accumulation margin and tear down the system as a whole (Glyn and Sutcliffe, 1972). The second strand is based on the *underconsumption* hypothesis. Through class struggle, capitalists would successfully achieve to compress wages and reinvest the accumulated surplus-value in ever-increasing productive capacity. This would lead to a chronic over production and commodity glut exacerbated by an insufficient aggregated demand, caused by the very capitalist class's success in compressing wages and spending power. As a consequence, a general devaluation would ensue. The 'underconsumptionist' thesis is at the core of Keynesian economic policy approaches, whereby demand should be artificially sustained through public spending especially during downturns (Sweezy, 1968). Connected to this is Minsky's financial instability theory, whereby a demand chronically weaker would be sustained artificially by finance capital issuing credit money for consumption and this would lead to cyclical financial crises (Minsky, 1992). The last strand was advanced by Marx in the third volume of capital and rests on the *law of falling rate of profit* (Marx, 1993). According to this, in the strive to increase labour productivity through technological change, with the rate of exploitation checked by other factors, fixed capital will increase in the total value composition diminishing the weight of variable capital. In other words, competition through technological change would irremediably result in machines replacing more and more labourers. Since the latter are the very source of value, hence of surplus value, their shrinking numbers would lead to a proportional disappearance of profit margins and therefore into a progressive and irreparable crisis.

economics hold, by some natural or external factor (for a comprehensive review see Whaples and Parker, 2013).

Harvey has innovated the historical materialist debate, through his theory of *overaccumulation*. Provided that capital is value in motion, Harvey explains, an aggregate ever increasing productive capacity would result in ever-larger quantity of capital that cannot be *profitably* reinvested, that is kept in motion. As long as overaccumulated capital remains under or uninvested, it stands to be devalued. In summary, the contradiction mentioned above implies a subordinated one between the tendency to accumulate ever increasing quantities of capital and the limited capacity to allocate them profitably.

Overaccumulation can take many forms in the real world. Amongst others, it can be manifest as commodity gluts and therefore as underconsumption and deflation, as monetary surpluses and generate credit bubbles or inflation, it can appear as surplus capital channelled into the built environment or emerge as excess of labour-power and unemployment. As long as overaccumulation is let free to run, it will lead to a crisis, which

> "is the name for phases of devaluation and destruction of the capital surpluses that cannot profitably be absorbed" (Harvey, 2018b p. xxiv)

The dialectic between overaccumulation and devaluation is strictly correlated to another between competition and technological change. Competition forces capitals, individually or collectively, to continuous technological change, which leads to increased productivity, therefore overproduction and, potentially, to devaluation. The latter can be warded off only by finding profitable investment opportunities for the overabundant capital. Investments are profitable, by definition, when the advanced capital becomes larger after a turnover time. It follows that, profitable investments absorb overaccumulated capital only by further expanding it, along a trajectory outstretched *ad infinitum*. Basically, a crisis caused by the contradiction between the systemic tendency to produce ever larger quantities of capital and the limited capacity to allocate them profitably can only be avoided by displacing it to a superior level (Harvey, 2018b p. 190 and following).

Transforming surpluses into new productive capacity offers a solution to overaccumulation in both temporal and spatial terms. In other words, and this is one of the most important

contribution by Harvey, capital responds to overaccumulation through *spatiotemporal fixes* (Harvey, 2018b; Ekers and Prudham, 2017). For ease of explanation, we will for a moment consider separately the two dimensions of the category. *Temporal fixes* take place mainly through the capital markets, orchestrating both private and public credit. Through them capital surpluses are gathered and channelled to profitable sectors in need of liquidity and, hence, invested effectively. *Spatial fixes* coordinate the allocation of overabundant capital through space. Both the temporal and spatial moment interpenetrate each other. We can imagine *spatiotemporal fixes* as a sort of relief valve, coordinating throughout time the *fixing* of overabundant capital into space, and the ecosystem, that is to say transforming it into new *fixed capital*. As Harvey has recently explained: "A part of the capital has to be fixed in order for the rest of capital to keep in motion" (Harvey, 2018a p. 461). In this process, it is not 'mere' machines that are built, rather entire landscapes are erected, as gigantic composite objects made of space, ecosystem functions and instruments. In Harvey's own words:

> "when we go beyond the image of fixed capital as mere machine, we find ourselves conjuring up a picture of capital building whole landscapes of cleared fields and factories; of highways and railways; of ports, harbors and airports; of dams, power stations and electric grids; of gleaming cities and massive industrial capacity" (ibidem)

Thanks to Glassman's work (2007), we can distinguish two distinct dynamics in spatiotemporal fixes. When they evolve through a *centralising* dynamic, surpluses are used to enhance internal markets absorption capacity, by either improving production, distribution or consumption infrastructures or supporting the reproduction of capitalist social relations by financing education, research or health care. When fixes follow a *decentralising* dynamic, surpluses are invested in outer geographies where potential profitability is higher thanks to territorialised socioecological factors. Amongst them we find lower land and labour costs [34]. These geographical differences, at the very basis for higher profitability margins, are continuously recreated as capitalism's historical geography (Glassman, 2007; Ekers and Prudham, 2017), through the interplaying between centralisation and decentralisation. As an example, we can consider the opening of new internal markets for 'green'

[34] The case studies of this research are a clear example for that (see chapter 7 and 8)

commodities, such as renewable energy, and observe how it mirrors the fixing of capital in outer geographies, such as renewable energy plants in rural or remote areas.

The contradiction between the fluidity of capital and the need for it to be partially fixed to ward off devaluation engenders *uneven geographical development* (Harvey, 2018b p. 415). Capitalism cannot avoid it as much as it cannot avoid crises, because

> "[…] capital builds a whole *landscape* [emphasis added] adequate to its needs at one point in time, only to have to revolutionize that landscape, to destroy it and build another one at a later point in time in order to accommodate the perpetually expansive forces of further capital accumulation" (Harvey, 2018 p. 461)

Uneven geographical development structures around centrality-marginality cleavages, where centres, peripheries or semi-peripheries are functional to expanded reproduction and interconnected along the division of labour at the global, regional, national and sub-national scale (see chapter 4). Yet, since spatiotemporal fixes are *unfixable* in time, being *ephemeral* as much as technological change, they *produce space* unevenly, and, following Smith's theory on the production of nature, they so *produce nature*.

A similar argument is systematised by Ekers and Prudham (2017; 2018) under the category of *socioecological fix,* combining different historical materialist frameworks. On the one hand, it incorporates Harvey's spatiotemporal fix. On the other, it contributes to understanding how a 'green' capitalism may allow to reproduce the ecological and social conditions needed for accumulation to run smoothly, by building on O'Connor's second contradiction theory (O'Connor, 1998) and Gramsci's hegemony theory (Gramsci, 1975).

As seen in chapter 1, Gramsci's theory explains that a dominating class keeps its hegemony on society only when it informs the ruling ideas. Otherwise, the control of the productive structure and coercive institutions would not be enough to preserve its class dominance. Focusing more on instability and change, O'Connor argues that capital accumulation undermines progressively the reproduction of its own existence conditions, both the ecosystem and social ones. Building on the notion of *scarcity* or *limit*, O'Connor argues that crises result from capitalism's endogenous tendency to overcome social and ecological limits, which in turn are considered as exogenous.

Against this backdrop, we can see that besides allocating of overaccumulated capital, a socioecological fix restores ecological conditions for accumulation and legitimises the social relations enabling accumulation.

'Green' investments and 'green' transitions in general can be interpreted as socioecological fixes to the extent to which they result from the re-functionalisation of the 1960s and 1970s contestations, turning environmentalist claims as they were framed within a wider social critique, from a potential threat to the order of capital, into a field of opportunities for a 'green' accumulation.

From this perspective, 'green' capitalism can be interpreted in Gramscian terms as a *hegemonic* project in the making (on 'green' rhetoric as hegemonic project see Fairhead et al., 2012). An organisational and technological transformation, towards 'greener' forces and relations of production in the structure, should correspond to the affirmation of a legitimation rationality building on the 'greening' as the core of the ideological, political and cultural superstructures. If such a *historical block* (on this category see chapter 1) would come into being both accumulation and hegemony would be ensured by the sheer fact that capitalism can produce more and sustainably. Nevertheless, the success of 'green' capitalism as a hegemonic project is far from being predictable. We can take the example of the renewable energy generation. While it is has been shown to be theoretically possible to replace all fossil fuels with renewables (Jacobson and Delucchi, 2011; Jacobson et al., 2016), this largely depends on how willingly those factions of the capitalist class whose accumulation strategies depend more heavily on fossil fuels would undertake a full transformation of their businesses (Malm, 2016). Their resistance could benefit from the cooperation of sectors of the labour class involved in fossil value chains and participating through their organisations, the trade unions, to the factional struggle. The state would play a major role in determining the outcome of this process, not as an arbiter, but rather as the site where the factional struggle would unfold around the control of regulatory mechanisms and coercive apparatuses [35].

[35] For an example of how social coalitions opposing the renewable transition have formed in Germany see Cumbers and Becker (2018).

Although the future of 'green' capitalism as a hegemonic project is still unpredictable, some of its effects are already tangible, including the re-legitimation of class power balances and the inherent inequality patterns under 'green' credentials (Corson et al., 2013; Dryzek, 2013). An example is the subsidisation of renewable energy generation, which are generally financed through fiscal mechanisms, such as a surcharge in the electricity bill. If a fiscal system is scarcely progressive, lower incomes will pay a heavier relative cost for decarbonisation. Such inequality is further worsened by the fact that subaltern classes, by reason of their lower incomes, bear predictably a smaller responsibility to the climate crises. In fact, by reason of their limited consumption they emit less GHG (Kartha et al., 2020). By the same token, the systems financing renewable subsidies such as those in place in Italy and Germany, as we will see in chapter 7 and 8, exacerbate this inequality even more by granting heavy emitters substantial exemptions from the levy imposed to finance the renewable transition. It is possible to deduce that an institutionalised 'green' discourse, nurtured across both the civil and political society apparatuses, can legitimise fiscal mechanisms, imposed by the coercive power of the state, which protect the accumulation schemes of the 'fossil' and most emitting factions of the capitalist class, while financing 'green' accumulation, by unjust bottom-up fiscal redistributions.

In conclusion, following Ekers and Prudham (2017; 2018) it should be noticed that the making of 'green' capitalism as a hegemonic project builds on class cooperation or conflict cleavages that are inherently performative. In the case of 'green' investments and 'ecologically' modernising processes, this has entailed a cooperation amongst international institutions, researchers and research institutions, lobbying organisations and international NGOs in systematising the operative categories of the 'greening' within the already hegemonic rationality of the neoliberal governance. These alliances can be reproduced at the many scales of 'green' investment geographies, from the international to the territorial, extending therefore down where 'green' commodities are produced. We will discuss in the next chapter how this implies processes of territorialisation (see also McCarthy, 2015), whereby the targeted territories are enrolled in large scale projects and policies designed and implemented through technicalised and centralised mechanisms side-lining territorial

communities, by dismissing their resistance or alternative visions as anti-modern, anti-eco-logic or even pro-oil[36].

3.5 Conclusions

This chapter has presented the core elements of the theoretical framework for this research. Specifically, it has explored the category of 'green' capitalism by using and innovating a range of historical materialist categories.

The chapter opening section has summarised the entire theoretical framework, so providing the basic instruments needed to navigate the following sections easily and effectively.

The third section has investigated capitalism as a mode of production, offering an interpretation of historical materialist categories of substantial importance to this thesis.

The fourth section has explored the co-constructive relationships between capitalism as a mode of production and the transformation of ecosystem spaces, flows and stocks. A preliminary philosophical digression has prepared the reconciliation of theory of the production of nature (Smith, 2008) with the socially necessary labour time theory of value. A discussion about the processes through which a capitalism's green turn may facilitate and indeed re-legitimise capitalist social relations under 'green' credentials has closed the section. Towards this purpose, the categories of hegemony (Gramsci, 1975), spatiotemporal fix (Harvey, 2018b) and socioecological fix (McCarthy, 2015; Ekers and Prudham, 2017; 2018) have been applied.

As a companion, the next chapter completes the presentation of the theoretical framework for this research, by investigating the spatial dynamics of a 'green' capitalism, combining several theories and debates, such as -amongst others- the world system theory (Wallerstein, 2004a), the theory on the social production of space (Lefebvre and Nicholson-Smith, 1991) and the contested notion of *territory*.

[36] Similar dynamics are documented by our two case studies in chapter 7 and 8.

Chapter 4 – 'Green' capitalism II. Spatial dynamics between extractions and competing territorialisation

4.1 Introduction

In the previous chapter we have investigated 'green' capitalism framing it as both a restructuring of accumulation strategies extending towards not yet or 'inefficiently' commodified ecosystem flows, stocks and spaces and, on the other hand, a legitimation rationality for older and newer patterns of accumulation. In this companion chapter, we will seek to further our understanding of 'green' capitalism by looking at its spatial dynamics at the level of the areas where 'green' commodities are produced or extracted, hence defined as 'green' investment areas.

The chapter is organised into three sections. The first focuses on the outer dimension of 'green' investment areas. Building on international political economy and extractivism literatures, it discusses their integration into the global capitalism accumulation patterns. The second looks at the inner dimension of 'green' investment areas, through the categories of *produced space, territory* and *territorialisation*. The third advances a definition of *territory* and the category of *territory grabbing and enclosure*, as a theoretical innovation for the study of 'green' capitalism spatial dynamics.

4.2 Uneven geographical development, 'green' enclaving, and value extraction

This section aims at advancing the analysis of processes through which 'green' investment areas are incorporated into geographies of accumulation and extraction. Towards this purpose, it is organised into four subsections introducing the categories of *division of labour, extractive enclave*, *value extraction chain* and *territorially based alliance.* All of them will be extensively applied to the analysis of this thesis's case studies in chapter 7 and 8.

4.2.1 Uneven development and the division of labour at the global and lower scales

As seen above, spatiotemporal fixies are adjustment mechanisms to overaccumulation, which become manifest as *uneven geographical development*. This category introduced by David Harvey explains that capitalism uneven geographical organization into different geo-political units -from towns to supranational organisations, characterised by a degree of inner spatial homogeneity in terms of productive specializations and level of development and, on an equal basis, an outer relational heterogeneity to each other, is simultaneously the spur and the limit to capitalism's universalising and abstracting tension. The quest for further and faster accumulation pushes capital towards uncharted territories hunting for excess profits in the meshes of spatial differences, so tending to universalise its rule over the entirety of socioecological relations. And by this very dynamic, it reproduces those differences as the very conditions enabling spatiotemporal fixes in the future. For instance, lower costs for labour or resources might drive investment into a region, determining de-industrialization and unemployment into another. In a nutshell, the possibility to realise potential excess profits distributed through geographies depends on the existence of unevenly developed geographies.

Harvey's argument about uneven development is correlated with Lenin's category of imperialism. According to the latter, multinational conglomerates of highly financialised and over-accumulated capital, strive to maintain high levels of profitability and accumulation, by using the state's political and military apparatuses to seize better opportunities on the world stage. In Lenin's own words:

> "[…] *uneven development* [emphasis added] and wretched conditions of the masses are *fundamental* and *inevitable conditions* and *premises* of this mode of production [emphasis added]. As long as capitalism remains what it is, surplus capital will never be utilised for the purpose of raising the standard of living of the masses in a given country, for this would mean a decline in profits for the capitalists; it will be used for the purpose of increasing those profits by exporting capital abroad to the backward countries. In these backward countries profits are usually high, for *capital is scarce, the price of land is relatively low, wages are low, raw materials are cheap* [emphasis added]. The possibility of exporting capital is created by the fact that numerous backward countries have been drawn into international capitalist intercourse [where] elementary conditions for industrial development have been created […]. The necessity for exporting capital arises from the fact that in a few countries capitalism has

> become «overripe» and [it] cannot find «profitable» investment" (Lenin, 1999 p. 58)

This recentres our focus on the relation amongst global capitalism, uneven development and the system of international relations. The expansion of capitalism at a global scale implies the organisation of production and trade across international borders, along patterns of domination, inequality and dependency compatible with capitalism's law of value. Historical examples for that are modern colonialism and neo-colonial forms of exploitation. This has been analysed by a range of theories applying historical-materialist categories to the analysis of unbalanced relations between core and peripheral countries, that is capitalism's centres and peripheries at world scale.

A first contribution is the re-systematization of the *dependency approach* operated by Paul Baran, who argued that former colonies' underdevelopment was the consequence of an enduring imperialistic dependency strangling their economies and institutions (Baran, 1957). Baran argued that these subaltern countries produced an *economic surplus*, defined as the difference between the total economic output and domestic consumption, which was mostly captured by foreign capitals. According to him, foreign capitals only reinvested in domestic sectors specialised in production of primary commodities for export. Significantly, when imperialist dependency could not be maintained by 'peaceful' economic exploitation, dominating countries, wherein the investing foreign capitals where based, would resort to deploying military force. Correlated to the dependency approach is the category of *unequal exchange*, advanced by Arghiri Emmanuel (1962). Under the assumption of perfect mobility of capital and the perfect immobility of labour, the category correlates structural underdevelopment and historically deteriorating terms of trade in peripheries. Central to Emmanuel's theorisation another category, that of *international division of labour,* which can be defined as the international productive specialisation differentiating world's countries and regions. According to Emmanuel, the 20th century division of labour was the direct consequence of western imperialism and colonialism in the previous centuries. Through it, peripheral countries are constrained to transfer most of the surplus value they produce to core ones, so depriving themselves of resources indispensable to their own development. This would happen because peripheral countries export cheap commodities produced by low-wage workers, while importing technologically advanced

and costly commodities produced by high-wage workers. Even in the hypothesis that both core and peripheral countries exported equally technologically advanced commodities, different wage level would keep surplus value flowing towards the core.

Building on these grounds Emmanuel Wallerstein advanced a major innovation with his *World System Theory*. The main tenet is that the modern world-system is a *capitalist world-economy* which began to arise in the XVI century. This is characterised by an interstate and heterogeneous political system, finding its sole unifying framework in a *transnational division of labour*. Espousing a critique to modernisation theories common to the aforementioned approaches, the world-system theory rejects the assumption whereby the capitalist world-economy would 'naturally' follow from national markets, through the strengthening of foreign trade. To the contrary, the division of labour has developed transnationally since capitalism's early history along structural relations, situating geo-political units, such as world-regions, states, or subnational regions, within core, periphery and semi-periphery patterns. These appear as continuously reproduced by unequal exchange, a structural condition of perpetual accumulation (Emmanuel and Bettelheim, 1962; Baran, 1957). As an important innovation, the world-system theory shifts the epistemological focus from the international relations to the transnational.

This debate was further developed by the theories of *ecological unequal exchange*. By including socioecological considerations, they draw attention to inequality patterns characterising the extraction, production and distribution of energy and raw materials and, on the other hand, waste disposal and pollution, with periphery countries bearing the higher costs and seizing the lower benefits (Rice, 2007; Clark and Foster, 2009).

4.2.2 Enclaving, extractivism and the 'greening'

An important category common to all the above discussed approaches and theories is that of *enclave economy* (Singer, 1950; Baran, 1957; dos Santos, 1968). The term defines a productive system confined to an area of a peripheral or semi-peripheral country, directly controlled by a foreign capital, *extracting* commodities or services with the sole aim of exporting them. In many cases, the country housing the enclave is a former colony of the country where the investing entity's headquarters are located. Enclave economies make investments significantly competitive, thanks to cheap labour-power and ad-hoc simplified

regulatory regimes, granting leeway for lower labour standards and tax avoidance. Moreover, enclave economies entail a scarce cooperation of foreign capitals with the local ones, which are integrated to perform functions with lower profitability. As a major consequence, little of the extracted surplus value remains in the enclave territory and country.

A cognate category is that of *extractivism*, which has been mainly applied to the of study Latin American countries and more recently also to South-east Asia and Africa's countries. In historiographic debates, the category defines a colonial economy, pivoting on the *extraction* for export of slave labour, agricultural commodities and minerals (Acosta, 2013). Differently, when used to investigate contemporaneity, the category help to retrace post-colonial extractive patterns, relegating former colonies to global capitalism's peripheral geographies. Studies on extractivism often correlate heavy dependency on export, productive primarization and unsustainable debt exposures to foreign states and capitals, with socioecological alterations and territorial communities' resistance[37] (Ye et al., 2020).

Related to both enclave economy and extractivism categories is that of *extractive enclav*e, which is used extensively to analyse the case studies of this research (see chapter 7 and 8). In the literature it is directly and indirectly applied to the study of resource grabbing (see as an example Côte and Korf, 2018).

Narrowing our focus onto 'green' capitalism, we can observe that, as a restructuring of accumulation strategies pivoting majorly on renewable energy generation and biomass production, it implies a growing importance of rural areas and regions, which increasingly emerge as productive centres (Smil, 2015; McCarthy, 2015). These can be considered as *'green' extractive enclaves* especially when a significant surplus value flow is extracted in and around ecosystem spaces, flows and stocks they enclose, through investment schemes scarcely or not integrated within the local socio-economic fabric, and exported to centres of the division of labour at the national or higher scales. In fact, the historical peripherality of these areas to urban centres, which itself makes very likely - at the very least - below-average land prices, overlaps and interrelates with their positioning within global

[37] Two new elements have emerged in the last decades. First, India and China have become two major outlets for Latin-American commodities. Second, revenues from primary commodities export have been increasingly used to finance social policies. This has led to the prevalence of the term *neo-extractivism* (Svampa, 2015; Mezzadra and Neilson, 2017).

capitalism's patterns, in a dialectical nexus connecting marginality, profitability and extractive organisation.

Although the category of 'green' extractive enclave does not seem to be explicitly associated in the literature with the analysis of either 'green' capitalism or renewable energy and biomass production, extractive and enclaving processes are identified, and sometimes associated with each other, when analysing 'green' investments. Howe and Boyer (2016) have investigated the correlation between a hegemonizing rhetoric around the 'greening' and surplus value extraction in Southern Mexico. They show that national energy transition policies can collide with community-based mechanisms for collaborative energy production and indeed favour large and internationalised capitals' extractive schemes. The role of state institutions in enabling 'green' extractivism around wind energy in the Mexican state of Oaxaca and repressing local populations' resistance is analysed by Dunlap (2018), who discusses the legitimation of counterinsurgency practices through 'green' discourses. Along similar lines, Argenti and Knight (2015) document how Greece's renewable transition policy , combining with policy responses to the country's sovereign debt crisis since 200, encouraged rent extractive schemes in and around solar energy generation. Similarly, Siamanta (2017; 2019) investigated the implications of the Greek renewable transition policy at several scales, contextualising rent extraction through wind and photovoltaic energy within a socioecological fix process to both Greece's sovereign debt crisis and the climate emergency.

4.2.3 Value-extraction chains from local to global

While the extractive enclave category enhances the analytical capacity of this thesis, as we will see in chapter 7 and 8, it implicitly entails cooperation and conflict patterns amongst classes, factions or actors, whose investigation requires further analytical instruments to be developed. Towards this purpose, a useful departure point is the category of *commodity chain* that in the context of the World-system theory is intended as "a network of labor and production processes whose end result is a finished commodity" (Hopkins and Wallerstein, 1986 p. 159). As Jennifer Bair explains in a magistral review, the category is crucial to explain the contradiction between "the centripetal forces of the world capitalist

economy […] and the organization of the geopolitical order into individual countries" (2005 p. 156).

Any chain includes several production-distribution-consumption nodes which can be intersected simultaneously by other chains, as it is the case, for instance, for intermediate commodities manufacturing (fixed capital). Transposing the socially necessary labour time theory of value to international political economy, the commodity chain category allows to investigate the dialectic between material flows and the division of labour along core-periphery relations. Most importantly, it makes possible to quantify the extracted surplus value and assess the patterns through which it is redistributed along the chain geographies and nodes.

Combining the commodity chain conceptualisation with insights from organization sociology, Gereffi et al. (1994) advanced the category of Global Commodity Chain (GCC). The authors so initiated a focus shift, away from the capitalist world-economy towards the study of inter and intra firm relations, so leading to a further category, that of Global Value Chain (CVC). This was first proposed by Humphrey and Schmitz (2000), who revisited the GCC approach through the lens of international business literature and Porter's value chain model (Porter, 2001). While the GVC approach aims at supporting managers and regulators' decision making, it departs substantially from the world-system theory and the underlying socially necessary labour time theory of value. In fact, GVC exponents identify value as *created* by capital. Nonetheless, some of GVC approach features are useful to the analysis of 'green' accumulation schemes, and specifically the attention to meso and micro levels and the emphasis on value flows.

Against this backdrop, this thesis advances the category of *value-extraction chain*. Similarly to Hopkins and Wallerstein's commodity chain, a value-extraction chain is intended as "a network of labor and production processes" (1986 p. 159), whose result is the extraction and accumulation of value rather than simply a commodity.

4.2.4 The territorially based alliance between capital mobility and immobility

If the extractive enclave category allows us to study the subalternity of a productive system within the global and lower scales accumulation patterns, that of value-extraction chain helps to clarify how an enclave may be integrated within those patterns. Nevertheless, the

dynamics of faction and class cooperation within enclaves and value-extraction chains still remain overshadowed. In other words, what needs further discussing is how the fixation of capital into specific portions of space, with a specific positioning in the global division of labour, can result into productive systems involving specific actors and relations. David Harvey explains this process through the category of *territorially based alliance* (Harvey, 2018b pp. 423–424). Through it, factions of the capitalist and labour class, local bureaucracies and territorial state articulations cooperate in the extraction and accumulation of surplus value in and around a commodity or service production. More specifically, factions of the capitalist and labour class engaged in a specific commodity or service production may find it convenient to negotiate common grounds, in order to reduce the social conflict which may disturb accumulation and, on the other hand, improve labour conditions. Local state articulations could grant regulatory and fiscal simplified regimes in exchange for a tax revenue or, in some case, personal gains, in the form of bribery for local bureaucracies. Since a territorially based alliance can be intended as a localised truce of the class struggle, it will last until some event changes its internal equilibrium, hitherto guaranteeing the redistribution of wealth and privilege to its members. When this happens, as Harvey stresses, the alliance breaks. The most mobile capital factions, such as financial capitals, will most certainly divest quickly and try to minimise losses or even realise more profits. The less mobile capital factions which are more dependent on fixed capital such as landowners or industrialists, would probably be slower in divesting, being exposed to heavier losses. Contrastingly, workers, local bureaucracies and institutions will be completely subaltern to capitals's choices and be net losers, unless they engage in some sort of organised conflict.

The category of territorially based alliance is particularly relevant to renewable energy generation. Since this is a highly subsidised sector, territorially based alliances are likely to form quickly around it (Siamanta, 2017; 2019; Dunlap, 2018), aiming at seizing the composite rent generated by renewables plants, and mainly financed by subsidies. Similarly, if subsidies are too generous compared to other revenue streams, or too concentrated in time, they may exacerbate rent-seeking behaviours minimising productive investments. Hungry rent-seeking investors may flock in a territory and run away when subsidies are reduced or terminated, triggering the sort of localised devaluations this research describes (see chapter 7 and 8).

This section has introduced and discussed the categories of *extractive enclave*, *value extraction chain* and *territorially based alliance* and explained their usefulness in the interpretation of the spatial dynamics of 'green' capitalism. In what follows, we will problematise the category of space vis-à-vis capital accumulation and the underlying power mechanisms.

4.3 The territory between spatial abstractions and 'green' extractions

When an area is targeted to house a 'green' investment, only the characteristics instrumental to value extraction and accumulation are relevant to the investing capitals and other the actors of the territorially based alliance. If we take the case of wind energy or biomass production, enabling productive conditions are the presence of good anemometric characteristics or adequate soil productivity. As a second step, other elements are considered to assess the investment feasibility, such as land costs, communication routes, subsidisation policies, regulatory frameworks, and the overall investment environment. Other characteristics specific to the area social and ecological identity with no function in value extraction and accumulation are simply disregarded or regarded as impediments. The area is therefore re-signified into a mere quantifiable reservoir of a selected pool of use values and abstracted from the social relations living through it as *space*.

This section introduces three categories to investigate the penetration of 'green' investments and its interrelation with pre-existing socioecological relations and systems of meanings. The section is organised into three subsections. The first discusses *space* as socially produced and introduces the category of *territory.* The second and the third explore different conceptualisations of *territory* and *territorialisation*.

4.3.1 Space: the mode of existence of social relations

Our first step is to discuss Henri Lefebvre's theory on the *production of space* (1991). According to the French philosopher, space is *where* and *how* social relations exist, which means that social relations can only be spatial and that space is for humans only social space. In other words, in the act of assigning social meanings and purposes to space humans *produce* it as a social relation. Consider, as an example, a church, an armoury, a park or a stadium. These are such only within human society, or, in Lefebvre's words, they

> "[…] are produced. The 'raw material' from which they are produced is nature" (Lefebvre and Nicholson-Smith, 1991 p. 84)

If we apply Marx's categories to Lefebvre's theory, we can argue that space is nothing less than the transformation of nature materiality into useful qualities (use values) giving them social sense through the agency of labour. In fact, Lefebvre goes on to explain that social spaces

> "[…] are products of an activity which involves the economic and technical realms but which extends well beyond them for these are also political products, and strategic spaces. The term 'strategy' connotes a great variety of products and actions: it combines peace with war, the arms trade with deterrence in the event of crisis, and the use of resources from peripheral spaces with the use of riches from industrial, urban, state-dominated centres" (idem p. 85)

While space and nature overlap completely outside social relations, space only becomes "concrete" through the dialectical synthesis of the "perceived-conceived-lived triad" (Lefebvre and Nicholson-Smith, 1991 p. 40), which makes space "at once a precondition and a result of social superstructures". All these considerations lead Lefebvre to the conclusion that space is a "social relationship" (idem p. 85)

> "[…] which is inherent to property relationships (especially the ownership of the earth, of land) and also closely bound up with the forces of production (which impose a form on that earth or land); here we see the polyvalence of social space, its 'reality' at once *formal* and *material* [emphasis added]. Though a *product* to be used, to be consumed, it is also a *means of production* [emphasis in the original]; networks of exchange and flows of raw materials and energy fashion space and are determined by it. Thus this means of production, produced as such, cannot be separated either from the productive forces, including technology and knowledge, or from the social division of labour which shapes it, or from the state and the superstructures of society" (ibidem)

On these grounds, Lefebvre develops a "long *history of space* [emphasis in the original]" (Lefebvre and Nicholson-Smith, 1991 p. 116) through which he identifies three different forms taken by space throughout history. The first is *absolute space,* that is the transfiguration of the nature experienced by peasant and nomadic populations into a sacred delimitation. The second is *historical space* during which the conditions for capital

accumulation start to consolidate in geographies "dominated" by the "town of the west" as a historical subject, and "the countryside under its control" (idem p. 49). Under historical space, nature is *appropriated*, although not yet *dominated*, by labour. In this process of "becoming independent" from nature, "labour fell prey to abstraction" turning into "abstract social labour" (idem). Throughout this separation, secularisation and commodification process, exchange value as a foundational abstract relation expanded first through the use of the money form, then through capital, coming to produce the third space form, that is *abstract space.* Emerging through the geometrical and linear codes of the renaissance, abstract space becomes distinctly visible since the XIX century, when a maturely internationalised capitalism produced it as incorporating

> "[…] the «world of commodities», [capitalism's] «logic» and its world-wide strategies, as well as the power of money and that of the political state" (idem p. 53)

Abstract space appears as dialectically incorporating the law of value and its hegemonizing power. Lefebvre explains that abstract space

> "[…] as a product of violence and war, […] is political; instituted by a state, […] is institutional. On first inspection it appears *homogeneous* [emphasis added]; and indeed it serves those forces which make a *tabula rasa* [emphasis in the original] of whatever stands in their way, of whatever threatens them - in short, of differences" (idem p. 285)

Yet, abstract space appears "homogeneous" only "on first inspection. In fact, like capitalism as a mode of production, it is trapped in the contradiction between centralisation and dispersal, unity and fragmentation. Therefore, abstract space "*is not* homogeneous; it simply *has* [emphasis in the original] homogeneity as its goal" (idem p. 287).

4.3.2 Space abstraction between power, counterpower and accumulation

If we apply the category of abstract space to 'green' investment areas we can contend that these are the abstract spaces of 'green' accumulation. Following Lefebvre, they result from abstraction processes which are "political" and "instituted by the state" and that are traversed by power as much as they are by exchange value and capital.

Such processes through which a sovereign power asserts its sovereignty on spaces, so transforming their socio-historical identity - *producing* them, are discussed in two different literature strands through the notions of *territory*, *territoriality and territorialisation*.

The first strand, represented by a well-established tradition of mainly anglophone scholars, focuses more on the strategies of a preeminent entity - which we might define as sovereign but not necessarily with a state character - aimed at extending or maintaining its domination over a geographical area. The second strand, developed particularly by francophone, italophone and Latin American scholars, regards territory as a dialectical interstitial spatiality and positionality defined by stratified historical dialectics between powers and counterpowers in *the long durée*. Both of them are relevant to this thesis and will be treated in what follows.

4.3.2.1 Territory, territorialisation and land grabbing

This subsection discusses the literature strand that conceives of territory as a political space controlled by the state -or powers legitimised by it- and extended through processes of *territorialisation* in the context of the capitalist mode of production. It also explores the related notions of *land grabbing* and *'green' grabbing*.

Territorialisation can be directed to and originate from political or economic organisations, such as a state or a multinational corporation, whose origin is external to the targeted space (Elden, 2013; Sassen, 2008; Sassen, 2013). Yet, particularly in the case of a state, strategies of territorialisation can be deployed over areas of an internal territory which are not fully under state's control or which it endeavours to re-functionalise to different productive or strategic purposes. This phenomenon is defined by Vandergeest and Peluso (1995) as *internal territorialisation* aimed at "establishing control over natural resources and the people who use them" (idem p. 1). Since then, the category has been explicitly and implicitly applied to study the appropriation of ecosystem flows, stocks and spaces for value extraction and accumulation (Sivaramakrishnan, 1197; Brenner, 1999; Peluso and Vandergeest, 2001; Buch-Hansen, 2003). More recently, the focus has expanded to the role that non-state actors play in territorialisation processes. Relevant literature has shown that capitals or non-capital private organisations can enact forms of 'private' territorialisation under some sort of legal and political legitimation supported by the state hegemony

(amongst others Corson, 2011; Gayer, 2014; Rasmussen and Lund, 2018). This is often read as a result of state-actors' capability to influence policy and regulatory processes, also leveraging discourses around development, conservation or decarbonisation (Corson and MacDonald, 2012; Corson, 2011).

This strand of literature intends territorialisation as correlated with the phenomena, and analytical categories, of *land enclosure* and *land grabbing* whereby communities or individuals previously *living* those spaces are forcibly expelled or incorporated into value-extraction chains and enrolled to accumulation schemes of one or more investment entities. Although land enclosure and grabbing are not always explicitly associated with territorialisation, they are most often read as driven by state and non-state actors' strategies to extend and strengthen their control over a geographical area.

As seen in chapter 3, land enclosures and grabbing were first identified by Karl Marx as the two epiphenomena characterising capitalism's primitive accumulation (Marx, 1976). Building on the categories of imperialism as elaborated by Luxemburg (2015) and Lenin (Lenin, 1999) and in line De Angelis's work (2001), Harvey has identified a process of *accumulation by dispossession* as a core dynamic of neoliberal capitalism, alongside 'normal' sustained accumulation (Harvey, 2005b p. 137 and following). This debate has further consolidated the prominence of enclosure and land grabbing as analytical categories key to historical materialist and critical studies on space and ecosystem dispossessions. Outside academic debates, the term *land grabbing* was popularised by a number of press and activist contributions published at the end of the 2000s. It was used to describe a sustained acquisition trend of vast tracts of land in the global South since the end of the 2010s, linked to the 2007-2008 financial and food crises (for a comprehensive overview see Franco et al., 2013).

As analytical categories, land grabbing and enclosure have been applied to the study of fields as different as global agribusiness, energy, financial and tourism industry, housing and expansion of urban sprawls, environmental conservation and climate change mitigation programmes (GRAIN, 2013; McMichael, 1994; Borras and Franco, 2012; Cotula, 2012; Hall, 2013). Particularly relevant to this thesis are land and resource appropriations that are legitimised through 'green' credentials (Fairhead et al., 2012) and defined as cases of *'green' grabbing* (amongst others Fairhead et al., 2012; Corson and MacDonald, 2012). The

term was coined by the Guardian journalist John Vidal (2008) seeking to picture the controversial aspects of environmental conservation.

An extensive discussion connecting the sourcing of 'green' commodities in marginal areas and peripheral countries to meet demand from the global North was conducted by Fairhead et al. (2012). A more nuanced contextualisation of 'green' grabbing as "the materialisation of natural capital" is advanced by Corson et al. (2013 p. 1). The notion of 'green' grabbing has also been applied to the study of specific ambits. Territorialisation and grabbing have been related to the convention on biological diversity and the actions it envisages (Corson and MacDonald, 2012; McAfee, 1999). Along similar lines, conservation and ecotourism have been studied as drivers of 'green' grabbing (Corson, 2011; Ojeda, 2012). Finally but most importantly to this thesis, 'green' grabbing has been correlated to renewable energy generation. Backhouse (2016; 2014) describes as 'green' grabbing the enclosing of Amazon lands for biofuel production. Aha and Ayitey (2017) illustrate how investments in biofuels cultivations undermined Indigenous populations customary land use and tenure in Ghana. Cases of 'green' grabbing related to renewable energy have been documented also in core nodes of global capitalism and specifically in the EU. Amongst others, Brunner (2019) interpreted the combination of agricultural subsidisation under the EU's Common Agricultural Policy and energy crop cultivation as a driver of 'green' grabbing on eastern Germany lands. The interplay between promotion policies and investments on wind and photovoltaic energy in Greece was explained through the categories of enclosure and 'green' grabbing by Siamanta (2017; 2019).

4.3.2.2 Territoire, territorio, territory

The literature illusrated above is underlain by two assumptions. First, territory is such insofar as it is dominated by a preponderant power. Second, in the very act of domination clear boundaries are set, which are defended against external or internal potentially countervailing powers (Halvorsen, 2018). Although this literature is perfectly capable of detecting conflicts between dominating and dominated groups or classes, it seems to conceive of territory as a monolithically established entity, resembling more to a platform waiting for the next preponderant power to plant its flag on, rather than a *lived* space à la Lefebvre. Building on similar arguments, Agnew (1994) attempted to innovate the *territorial paradigm* of international relations scholarship by theorising the existence of a *territorial trap*.

This conceptual loophole would induce international relations theorists to think of territory as an ahistorical, fix category, completely overlapping with that of territorial state and merely serving as a "container of society" (p. 60). By contrast, the interpretations which we are going to discuss in this subsection all share an understanding of territory as a produced social space, wherein practices, knowledges and relations stratify and come to live through material and immaterial cultural forms. This perspective is particularly developed in francophone, italophone and Latin American literature. Therefore, we will refer to these different, yet dialoguing, traditions by using the word for territory in the original language, so as to differentiate from the anglophone literature and its pivoting on sovereign territoriality.

In Francophone literature *le territoire* is connoted by the social relations living *through* and *as* it. Following Raffestin's argument, we can contend that *le territoire*, as it is molecularly traversed by power, is a system of meaning through which a community or a group communicates its intensions and "material reality", or -in other words- realises its culture and relations through the production of a space, which tends to be hegemonic. As Del Biaggio notices, in an enlightening article comparing anglophone and francophone conceptions of territory, *le territoire* is "qualified by society" (2015 p. 40). This is echoed by Debardieux who explains that *le territoire* is

> "[…] a social construct that connects a material base made of a geographical space to a system of values that gives multiple and combined meanings to each component of this space (the places [*lieux*], but also the spacing [*espacements*] and the discontinuities it encompasses" (in ibidem).

From a similar perspective, Bourdeau maintains that *le territoire* reflects the cultural identity of a community and is reflected by the cultural identity of a community. If the cultural identity of a community is inherently territorial, then the cultural signification of a space into a *territoire* is a process of cultural appropriation, whereby the *sense of belonging* to a *territoire* and the *sense of care* for it are established (idem).

In the italophone literature, elaborations about *il territorio* point to two interrelated tendencies. The first is represented by Alberto Magnaghi, the founder of the Italian *territorialist* school. Magnaghi is an urbanist architect by education and his deep knowledge of

Italy's urban and architectural landscapes must have influenced his historicised definition of *territorio*. According to him, the *territorio* is

> "[…] the historical product of co-evolutionary processes in the long durée between human settlement and the environment, nature and culture and, therefore, […] the result of the transformation of the environment through the work of consecutive and stratified cycles of civilisation. [It] does not exist in nature (it should not be mistaken for land or space) [it is] is a *living organism with a high complexity* [emphasis in the original], a continuously transforming *neo-ecosystem* [emphasis added], produced by the merging of cultural occurrences and nature, composed of *places* [emphasis in the original] with an identity, a history, a character, a long term structure" (Magnaghi, 2013 p. 25)

Territorios are thought of as opposed to the abstracted spaces of accumulation, which entail the erasing of historically stratified socioecological specificities. To counteract processes of abstraction, Magnaghi envisages territorial mobilisation and organisation as a direct consequence of the *sense of belonging* and *care* for a *territorio*'s cultural identity. The practice of care protects territorial identities from becoming intolerant or exclusive, rather fostering their development as inclusive and solidary (Magnaghi, 2007). It is exactly the emphasis on political mobilisation that connects Magnaghi's territorialism to the second tendency, fully embedded in the political actions of the countless grassroots organisations and activist network which define themselves as *territorial movements* [movimenti territoriali]. These movements are engaged in struggles, from the local to the national scale, combining social and environmental justice claims (Pellizzoni, 2014).

Latin American literature about *el territorio* is rich and fully grounded on a constant dialogue between social practices, research and political struggles for emancipation (Porto-Goncalves,2009). Seminal is Arturo Escobar's work. Building on many years of political engagement and ethnographic interaction with Afro-Colombian activists, the anthropologist defines the territory as a "political ontology" embracing a "multiplicity of worlds" in a "pluriverse" (Escobar, 2008). According to him, this remains unintelligible for western and modern social theory since it lacks necessary knowledges which, contrastingly, are fully embedded in territorial worlds. A common understanding underlaying Latin American debates on *territorios* is that they can be sites for social emancipation, both within and without the city. Zibechi, who studied the counter-territorialisation of urban spaces by urban

movements, stressed in a recent interview that *territorios* can become emancipatory arenas only through political subjectivation, since he explains

> "They occur when subjects create a new world, where production no longer is done with agrochemicals, and where they decide what type of schools or health they want, where they have power mechanisms different from the state, in other words, non-state powers, powers inspired through a community approach" (Streule and Schwarz, 2019)

4.4 'Green' capitalism at work: the grabbing of territory

This section aims at contributing to debates relevant to the spatial dynamics of 'green' capitalism, by proposing a definition of *territory* and advancing the category of *territory grabbing and enclosure.* Both of them build on the above discussion and are key to the analysis of the case studies.

As a preliminary statement, it is important to clarify that the use of the English word *territory* is here preferred, despite declinations of it in different Romance languages and literatures benefit from richer universes of meaning, as seen above. As Halvorsen (2018) argues, the use of *territory* (in English), expanded with meanings from different theoretical and political traditions, complements the categories of *space* and *place*, by emphasising the constructive power of "political projects/strategies that appropriate space" (idem p. 6) beyond the narrowness of the sovereign state dimension.

Territory is here intended as a material and spatial *mode of existence* of social relations. From this perspective, it is the result of a historically stratified dialectic between nature and itself, which is to say between humans and nature, mediated by labour and codified in changing cultural systems of meaning. In this sense territory is a socionature living *through* and *as* history; constructed as both *human* and *more-than-human*; composed of *places* and *distances*; visible as *landscapes*. Territory is incessantly traversed by power struggles along class, race and gender cleavages, which situate it as a contested '*interstitiality'* in the meshes between hegemonies and counter-hegemonies, institutions and counter-institutions, universes and pluriverses. For this very reason, territory is to be regarded as the arena where different political projects confront and clash through *competing territorialisation* (De Rosa, 2018 p. 47). Territory is the space where a preponderant power assert

itself as sovereign by enclosing it within borders and, precisely because of that, exposes itself to the risk of being contained or overturned by counter-powers capable of appropriating that very space. Territory is the space where capital accumulation takes place and where it can be opposed or contrasted.

Territory grabbing and enclosure is here intended as a process whereby a territory, or places of it, is abstracted from its stratified historical identity and transposed into costs and potential revenues within the accumulation function of an investment scheme, to the benefit of factions of the capitalist class. As a result, a territory, or places of it, is re-signified into an object of capital, whether as a reservoir of ecosystem flows and stocks, as composite and extended instrument (fixed capital), or still as space for expansion of capital's *built environment*, for production, distribution, consumption or waste disposal.

This working definition which will be refined vis-à-vis empirical analysis in chapter 7 and 8 and extended into a full definition advanced in chapter 9.

4.5 Conclusions

This chapter has studied the spatial dynamics of 'green' capitalism by combining a number of theories and categories from historical materialist literature. Amongst others, it has drawn on the world system theory (Wallerstein, 2004a), the debate around extractivism (Acosta, 2013), the theory of social production of space (Lefebvre and Nicholson-Smith, 1991), and different understandings of territory (Halvorsen, 2018) and territorialisation (Vandergeest and Peluso, 1995).

As a result of such a composite discussion, the chapter has advanced an original definition of territory and proposed the analytical category of territory grabbing and enclosure, both aimed at deepening our understanding of 'green' capitalism's geographies.

In view of the presentation of empirical analysis and findings, the next chapter elucidates the methodology used to gather, analyse and interpret information.

Chapter 5 – Methodology

5.1 Introduction

The renewable energy transition is often presented as a win-win game: it can boost economic growth while mitigating the ecological crises. It is -so goes the mainstream discourse around it- a process innovating the productive and governance systems in both economic and ecological terms. In capitalist economies, the privatisation of renewable resources, including spaces through which they can be accessed, and the subsidisation of private capitals, is assumed as the best possible model to operate the transition. As we have seen above, the areas where renewable energy is produced are conceived of as abstract spaces. Voided of any *living* socioecological distinctiveness -including conflict and inequality cleavages, they simply are regarded as de-politicised reservoir of a given renewable resource and source of revenue. This research was designed and produced exactly to problematise the assumption positing renewable energy transition as a mere technical process happening beyond the historicity and spatiality of the social relations that make it possible.

Such critique has been developed through a methodology that is presented in this chapter. By first describing the long intellectual process through which the research was ideated, the first section illustrates the research design, its main goal and questions. The second section presents comprehensively the methods used for data collection and analysis. A reflection on research ethics and the author's positionality concludes the chapter.

5.2 Research ideation, design and key questions

The analytical attitude and practical approach that has informed the ideation, design, conduction and writing of this research is *iterative*. The initial speculation on broad ideas, the formulation of more precise hypothesis and relevant research questions, the identification of methods for data collection, analysis and validation, and finally the organisation of the narrative and analytical effort that writing a PhD demands, were all conceived of as a constant dialogue between deductive and inductive reasoning. This resulted in a continuous process of hypothesis formulation, triangulated data collection and analysis, hypothesis

verification, empirical and theoretical conclusions drawing, and back again to hypothesis (re)formulation especially in, but not confined to, the data analysis phase.

This section illustrates fully the intellectual and empirical path leading to this research and thesis. It provides a succinct account of the ideation phase in the first subsection. In the second it discusses the research design, the key research questions and the methodological approach identified to address them.

5.2.1 Ideation

The ideation of this research is the result of a process developed over many years. The first conceptual speculations that would later lead to the drafting of a research proposal started during my years as a consultant at the International Fund for Agricultural Development or IFAD. This is a specialised agency of the UN system and an international financial institution, funding agricultural development projects in 'developing' countries. As a consultant at IFAD between 2008 and 2013, my task was to do research on land access and tenure issues in peripheral countries and specifically on areas inhabited by indigenous peoples' communities. In this context and for the first time, I could observe and analyse as a non-academic researcher cases of *land grabbing* and *enclosure*. I could also realise that these terms remained confined to niche academic and non-academic literatures and were largely absent from the institutional jargon of UN agencies. The situation changed in the years after 2007-2008, when the interplaying of a food price crisis and the Great Financial Crisis triggered a global rush to peripheral countries' lands, which started to be targeted for food and bioenergy production and financial investment.

A number of large land acquisitions drew the attention of specialised press, international NGOs and scholars. As a result, an intense debate followed, within and without the academia, associating the terms *land grabbing* and *enclosure* to food and bioenergy production in peripheral countries and through quantitative metrics (for a review see Borras and Franco, 2012). The specificities of the tasks I was performing at IFAD and my pre-existing interest in historical materialism triggered the intellectual speculation at the basis of this research. A preliminary consideration I came to was that, in the light of Marx's (1976) writings on primitive accumulation and the following historical materialist scholarship on the theme, land grabbing must have been a much more extended phenomenon than just

concentrated around food and bioenergy production in peripheral countries. As my interest calibrated towards land grabbing and enclosure in capitalist centres, I conducted an exploratory literature review and came to the conclusion that land grabbing was happening also in core capitalist contexts, especially the EU, although remaining a hitherto under-investigated topic. I so realised that studying land grabbing in capitalist centres could not only widen the knowledge about the topic, but also strengthen the broader understanding of capitalism as a mode of production, by calling into question the mainstream theses that within and without the academia would correlate the phenomenon to poor, yet correctable, functioning of political and market institutions. On these premises I drafted a PhD proposal, fully grounded on a historical-materialist framework, aiming at studying land grabbing in the EU. I submitted that to a number of Italy and in the UK's universities. Eventually, the proposal received an offer by the School of Geography of the University of Leeds and was awarded a University of Leeds scholarship, to start a PhD research in October 2016.

Once enrolled, I conducted several rounds of literature research around land grabbing and enclosure, with a focus on the EU. These showed that there was ground to hypothesise that some land acquisitions for the construction of renewable energy plants could be defined as cases of land grabbing. Land enclosures for projects formally intended to achieve an environmental purpose, such as conservation or renewable energy production, are defined in the literature as cases of 'green' grabbing (see chapter 4). Basing on this evidence, and particularly on the fact that 'green' grabbing in Europe appeared to be an understudied topic, whose investigation could help clarify mechanisms and tendencies of contemporary capitalism, I and the research supervisors decided to reframe the focus of the PhD onto 'green' grabbing. After another round of exploratory research on the topic, including discussion with academic and non-academic experts, I concluded that 'green' grabbing was to be regarded as an example of accumulation by dispossession framed within a wider dynamic of capitalism 'greening' and expansion in the context of the ecological crises.

5.2.2 Design and guiding questions

As the ideation phase came to an end, the intention to contribute to the debate around the 'greening' of capitalism and its spatial dynamics became the rationale on which the design phase built. Given the breadth and depth of that debate, the first methodological

choice was to narrow the focus down onto a specific ambit of the 'greening' of capitalism and analyse renewable energy generation within the context of the EU capitalism. While the generation of renewable energy is a core sector for both the ecological transition and the 'greening' of capitalism, the EU market offers the opportunity to observe its organisation in a fast-developing, heavy-subsidised market (for an overview see Solorio and Bocquillon, 2017).

In the light of these preliminary delimitations, the actual formulation of the research main goal and questions, and the identifications of methods, was prepared through a critical analysis based on the categories of historical materialism and empirical literature on renewable energy generation (amongst others see Howard et al., 2013; Yenneti et al., 2016; McMichael, 2009; Hamelinck, 2013; Hadjimichalis, 2014; Sullivan, 2017; Siamanta, 2017; Argenti and Knight, 2015), both within and without the EU. From it emerged that assuming the enclosure of ecosystem spaces, stocks and flows, for the renewable energy generation, as epiphenomena of capitalism 'greening' -or 'green' capitalism- would imply the study of three interrelated ambits. Specifically, based on the investigation of value extraction and accumulation patterns, an analysis of the involved social relations as they exist through space should be developed, including the construction of governance systems through processes of de-regulation and re-regulation, underlain by hegemonizing narratives around a 'green' growth (Castree, 2008b; 2008a; Corson et al., 2013; Ekers and Prudham, 2017; 2018).

The complexity of the three ambits and the intention to study them in depth, including the visions and perceptions of the actors involved, suggested to further simplify the analysis scope and study them at the subnational level, by adopting a case study approach, through a plurality of qualitative methods and the support of descriptive statistics. This choice made possible to apply a historical-materialist dialectical logic throughout the phases of both data collection and analysis. In fact, a case study approach allows to frame the geographical difference as interrelated with broader socio-historical dynamics. Through a constant juxtaposition of micro and macro observations and an iterative dialogue between hypothesis and results, the unicity of any case study can be analogised, compared and contrasted with similar phenomena happening in different contexts. Following Hegelian dialectic, we should notice that while difference negates universality by its very existence,

universality is such because includes all differences, that is all its negations. By consequence, the *unicity* of the phenomena under investigation, such as value extraction and accumulation around localised systems for the generation of renewable energy, can be found in places different from those studied by this research. In other words, their unicity does not coincide to any extent to a *monadic singularity* (Castree, 2005).

The techniques used for case study selection and sampling will be discussed in the next section. Here suffice to say that in order to build a solid and composite evidence base two different renewable sources were selected. One is wind energy, the other biogas from energy crops. They were studied and analysed through two distinct case studies conducted between 2016 and 2020, respectively on four provinces of the Italian southern Apennine, such as Avellino, Benevento, Potenza and Foggia, and in Brandenburg and Mecklenburg-Vorpommern, two states of the eastern part of the federal republic of Germany.

Against these premises, we can now turn our attention to the research main goal. This is to investigate the extraction and accumulation of surplus value as it takes place in and around the generation of renewable energy at the level of production areas or *territories* (see chapter 4), the enclosure and transformative processes it triggers, the class and factional cooperation, or conflict, patterns it entails, and the governance processes to which it is associated in terms of both hegemonic narratives and institutional structures. In order to achieve its main goal, this research theoretical and empirical investigation is oriented by four questions:

- How it is possible to understand the consolidation of the governance systems regulating renewable energy transitions in the EU and national contexts and regions of the case studies through the historical materialist categories of sublation (re-functionalisation) and hegemony?
- How can we interpret the extraction and accumulation of surplus value in and around renewable energy in terms of the socially necessary labour time theory of value? What are the implied distribution, cooperation and conflict patterns amongst class and class factions and groups?
- How does the enclosing of ecosystem spaces (lands), stocks and flows targeted for renewable energy generation take place? Is force organised through legal frameworks, physical violence or market mechanisms, or a combination of the three?

- How does the extraction and accumulation of surplus value in and around renewable energy transform socioecological relations in the production areas, in terms of class relations and space and nature commodification (abstraction)?

5.3 Case studies and data collection

This section describes the structuring of the case studies, from their initial identification to the methods used for data collection. It is organised into three sections. The first presents the techniques used to identify the case studies. The last two discuss the data collection methods applied to each of the case studies.

5.3.1 Case study identification and structuring

The identification of the case studies was conducted through a purposeful sampling methodology, guided by the research epistemology (see chapter 1) and tailored to its main goal and questions. It was also intended to allow for building an overarching triangulation system and formulating some valid generalisation. Towards this purpose, it was chosen to conduct multiple case studies and to include both renewable sources from biotic services and abiotic flows (see chapter 7 and 8).

Table 5.1 Case studies identified at an early research design phase

Renewable energy system location	Germany - states of Brandenburg, Mecklenburg Vorpommern	Italy - provinces of Foggia, Benevento, Avellino, Potenza	Greece - Macedonia, region of Thessaly
Energy source/carrier	Energy-crops/biogas	Wind	Sun
Key facts	After reunification in 1990, privatization of public lands in eastern Germany has triggered a "rush to land" driven by land price differentials , incentives on biomass/biofuels production and agricultural subsidies under EU Common Agricultural Policy	Lucrative incentives and a simplified permitting and fiscal regime has triggered investments by national and international investors	Sovereign debt crisis has forced farmers to sell out their land or develop renewable plants through borrowed funds, relaying on public incentive that were cut at a later stage leaving farmers with unsustainable debt
Land enclosure dynamics	Market mechanisms	Regulatory/market mechanisms	Regulatory/market mechanisms
Incentive scheme	Tax breaks; feed-in-tariff/premium; agricultural subsidies	Tax breaks; feed-in-tariff/premium	Tax breaks; feed-in-tariff/premium
Main features of the investment entities	National and multinational companies	National and multinational companies. Investments from armed capitals (mafias) has been documented	Investors from Spain and Germany. Local SMEs installing photovoltaic panels
Opposition/resistance	Small and young farmers' organisation trying to influence public debate on land privatisation through campaigning/demonstration. The term "land grabbing" is used	Awareness campaigns and demonstrations from civil society organisations engaged in environmentalist and anti-capitalist movements at a multiple scale	Awareness campaigns and demonstrations from civil society organisations engaged in anti-austerity/anti-capitalist movements at a multiple scale

As a first step, three selection criteria were identified, such as the presence of a renewable energy production system, a documented or debated processes of land enclosure and concentration related to renewable energy generation, the existence of movements contesting or resisting the renewable energy system or parts of it. The latter was considered a key element towards broadening the heterogeneity of the sample for observation and interviewing.

The sampling strategy for the identification of the case studies was further refined by spatial criteria reflecting historical materialism's categories. Specifically, the classification advanced by Wallerstein's world system theory was applied (2004a). According to this, the capitalist world-economy is characterised by a transnational division of labour, whereby geo-political units, such as world-regions, states, or subnational regions, may play core, periphery and semi-periphery functions in global accumulation patterns. Thanks to this, it is possible to study (the positioning of geo-political units within) global flows of value, labour and commodities, as they structure geographies of power and inequality along dependency and extractive dynamics and connecting geo-political units, such as world-regions, states or subnational regions.

Initially three potential case studies were identified: the production of biogas, and of the energy crops used as fermentation substrata, in Brandenburg and Mecklenburg Vorpommern in east-Germany; the generation of wind energy in four provinces of the Italian southern Apennine across the regions of Campania, Basilicata and Puglia; the conversion of solar radiation into electricity in the Greek region of Thessaly. The first case involves a renewable resource from a biotic ecosystem service, agricultural soil productivity, located in country at the core of the EU's division of labour, the second concerns an abiotic flow, wind kinesis, in a semi-peripheral country, the third also focused on an abiotic flow in a peripheral country. The determination about the centrality or peripherality of the countries was based on macroeconomic fundamentals between 2011 and 2017.

In order to simplify the sample and make it researchable in the course of a four-year PhD, it was decided to actually conduct two case studies. This time the selection was based on a combination of purposive and convenience criteria. The case studiy on biogas in Brandenburg and Mecklenburg Vorpommern was maintained, since it was the only one including a biotic ecosystem service. Of the two involving an abiotic flow, that on wind energy in

the Italian southern Apennine was kept. My identity of Italian native speaker was deemed crucial in facilitating data collection and analysis.

The study of the two cases was conducted by mixing qualitative methods, descriptive statistics, and rudimentary economic modelling. For the qualitative part, I used methods including direct observation, loosely structured interviews with renewable projects stakeholders, documentary analysis of objects such as investors' position papers, regulatory documents, policy frameworks, local authorities' plans of action, grassroots organisations' items. For the descriptive statistics part, I analysed data provided by national statistical offices, specialised agencies, and consulting companies. For the economic modelling part, I relied on information retrieved from regulatory frameworks or automated modelling systems provided by public agencies, in order to generate data on investment revenue structure and profitability.

5.3.2 Case study A – data collection on wind energy in southern Italy

This subsection describes in detail the conduction of the case study on wind energy in southern Italy and the methods that were used for data collection, as they were applied between February 2018 and June 2018.

The first research activity was to conduct a documentary analysis focusing strictly on energy and wind energy data, which allowed to further delimit the fieldwork area to four provinces. These include the province of Foggia located in Puglia region; the provinces of Benevento and Avellino located in Campania Region; the province of Potenza located in Basilicata region. The four provinces form a contiguous territory stretching over a sector of the Italian southern Apennine known as Apulo-Campano Apennine. They house 41 percent of Italy's wind installed capacity distributed in large and smaller plants (see chapter 7).

As the fieldwork area was definitively delimited, a months-long period of documentary research started in the period between the end of 2017 and the beginning of 2018 leading to the actual conduction of fieldwork activities. In this phase, three aims were achieved. The first was to clarify the historical and socio-economic context of the case study; the second was to frame the fieldwork region within the wider Italy's path towards the institutionalisation of the environment as a policy area; the third was to form a general

understanding of wind energy investment in the fieldwork region. The former two were addressed through the investigation of academic and non-academic literature, while the last through the analysis of reports from institutions and descriptive statistical elaborations.

During this period also a logistic activity was carried out to establish partnerships with local universities and scholars. A solid and working relationship with local scholars was deemed crucial in order to enhance data collection and analysis as an iterative process throughout all the fieldwork phases. As a result, two partnerships were agreed, with the University of Salerno and the University of Naples Federico II, which hosted me as a visiting PhD researcher.

5.3.2.1 Preparatory interviews with specialised scholars

The knowledge base built through the preparatory documentary research was further extended through a round of loosely structured interviews with six scholars from Italian Universities, by reason of their expert knowledge on either wind energy production, the fieldwork region or both. Table 5.2 provides a full list of the preliminary interviews which have been pseudonymised in order to protect participants' identity.

Table 5.2 Preparatory interviews with experts for case

Pseudonym	University	Interview period
AC/IT-1	Università degli Studi Suor Orsola Benincasa di Napoli	Winter 2018
AC/IT-2	Università degli Studi di Napoli "Federico II"	Winter 2018
AC/IT-3	Università degli Studi di Salerno	Winter 2018
AC/IT-4	Università di Pisa	Winter 2018
AC/IT-5	Università degli Studi di Napoli "L'Orientale"	Winter 2018
AC/IT-6	Università degli Studi di Palermo	Winter 2018

The interviews had a double aim. On the one hand, they were used to start collecting data towards the four research questions and triangulate them with the information gathered in the preliminary documentary research. On the other, they provided insights and information which proved crucial in preparing an orderly and effective course of fieldwork activities. This was so especially with regard to cultural and geographical characteristics; potential risks and difficulties; best strategies to conduct direct observation and access interviewees (see following subsection and 5.3.2.3). During the interviews, potential gatekeepers for interview with wind energy projects stakeholders were discussed and identified.

5.3.2.2 Interviews with project stakeholders

Interviews with wind energy project stakeholders were a core method for the collection of primary data. By project stakeholder it is here intended any individual that by reason of the social function he or she performs, or the place he or she inhabits, has an interest potentially or actually either benefiting from or damaged by a wind- energy project or system of projects.

The selection of potential participants was carried out through a combination of purposive and snowballing sampling. As a first step, three gatekeepers were identified, with whom a double round of interviews was carried out. The first took place as an open conversation intended to identify other participants. Differently, in the second-round gatekeepers were interviewed as normal participants.

By combining evidence from preliminary research and information from gatekeepers, potential informants were organised into six categories:

(i) Activists opposing or contesting wind energy projects, reported in table 5.3 and elsewhere in the text as *Activists*

(ii) Individuals with an expert knowledge on either wind energy production, the fieldwork region or both, reported in table 5.3 and elsewhere in the text as *Experts*

(iii) Investors in any of the productive segments or productive cycle of a wind energy project, reported in table 5.3 and elsewhere in the text as *Investors*

(iv) Landowners from before the implementation of a wind energy project, reported in table 5.3 and elsewhere in the text as *Landowners*

(v) *Local politicians* with or without operative links with wind energy production or energy crops cultivation as a result of their professional activity reported in table 5.3 and elsewhere in the text as *Local politicians*

(vi) Project area inhabitant, reported in table 5.3 and elsewhere in the text as *Inhabitants*

Table 5.3 List of interviews for case study A

Pseudonym	Narrative pseudonym	Interview period
Activist-1	Cettina	Spring 2018
Activist-2		Winter 2018
Activist-3		Spring 2018
Activist-4	Giuseppe	Spring 2018
Activist-5		Winter 2018
Activist-6	Alessandro	Winter 2018
expert-1		Winter 2018
expert-2		Winter 2018
expert-3		Spring 2018
Expert-4		Winter 2018
Expert-5	Francesco	Spring 2018
Inhabitant-1		Winter 2018
Inhabitant-2		Winter 2018
Inhabitant-3		Winter 2018
Inhabitant-4		Winter 2018
Inhabitant-6		Winter 2018
Investor-1	Alfonso	Winter 2018
Investor-2	Arianna	Winter 2018
Investor-3		Winter 2018
Investor-4		Winter 2018
Landowner-1		Winter 2018
Landowner-2		Winter 2018
Landowner-3		Winter 2018
Landowner-4		Winter 2018
Landowner-5	Margherita	Spring 2018
Local politician-1		Winter 2018
Local politician-2		Winter 2018
Local politician-3	Enrica	Winter 2018
Local politician-4		Winter 2018
Local politician-5	Gianni	Winter 2018
National politician-1		Winter 2018
National-level environmentalist NGO's member-1		Winter 2018

Through a further purposeful selection of the information provided by the gatekeepers a list of 49 potential participants was compiled, of which 31 were actually contacted and interviewed (see 5.3). A balance amongst the six different categories of participants was maintained as much as possible in the evolving fieldwork conditions. In this respect, it is important to notice that the initial list of potential participants changed many times and that in the majority of cases they were contacted and interviewed as a result of direct observation sessions. Two participants were interviewed that do not belong to any of the above categories. Although the level of information they provided would suggest they should fall within the expert category, the function they perform is directly related to their capability to provide this information and was also key in interpreting it. For these reasons, it was decided to include them under the distinct categories of *national politician* and *national-level environmentalist NGO's member*. All interviews were pseudonymised on several levels to protect participants' identity. A *narrative pseudonym* was assigned to participants from whose interviews fragments were taken and quoted in the thesis, in order to preserve the narrative integrity and fluidity of the text.

The interviews were developed to last up to an hour. They were designed following a 'tree and branch' structure (Rubin and Rubin, 2011). Specifically, the interviews were conceived of as composed of blocks each addressing a different aspect of the research goal, as indicated by the research questions. Their aim was to capture information, as well as opinions and perceptions, to be interpreted, compared and validated through multiple triangulations. An indicative list of questions is provided in appendix A. The main body of the interview was designed to be the same for all categories of informants. Although this was a main feature of the interview process, intended to ensure comparability through heterogeneity, after the first interviews were conducted it appeared necessary to formulate specific questions for each category of participants, in order to collect perceptions and interpretations correlated to the social positioning of every participant.

5.3.2.3 Direct observation

Direct and participant observation played a major role in contacting and interviewing projects stakeholders. Apart from this, through direct observation gradually emerging findings and evidence were elaborated and reflected upon, by making sense of the actual spatiality of the fieldwork region. During the five months that I spent living in the case study region

and travelling from a village to another, every detail of the immersive experience concurred to the analysis and interpretation of the gathered information. This holds true obviously for the moments that were 'formally' part of data collecting, such as listening to the answer provided during an interview or analysing written information. Yet, the interpretive activity was to some extent more intense during moments that were 'informally' part of the research. Specifically, insightful were observations of the landscapes vis-à-vis information provided by participants, but also the participation in convivial events where I could enjoy open conversations with inhabitants not expressly focused on the research questions, but still relevant to the construction of a broad-based knowledge. While this 'informal' activity was extensive in time length, it also was considerably dense in terms of early processed information. During observation, both shorter and longer field notes were written.

5.3.2.4 Documentary research

The data collection phase was supported by a constant iterative process of triangulation with documentary analysis. Seven categories of documents were analysed, such as regulatory documents from local, regional and national institutions, court judgements, press reports and articles in written or video form, minutes of local institutions and specialised agencies boards, parliamentary hearings, companies and investors reports.

5.3.2.5 Descriptive statistics

Where possible, qualitative information was interpreted, cross-checked, and complemented through descriptive statistics. Used resources included public databases such as those provided by ISTAT, Italy's national statistical service, and EUROSTAT, EU's statistical service. Data were complemented with databased provided by public specialised agencies. A private database provided by www.windpower.net was also used.

5.3.2.6 Economic modelling

Value extraction and distributional patters of wind projects were assessed through the economic modelling of two hypothetical projects WP1 and WP2. The information needed to quantify the cash flow from subsidisation was sourced through the analysis of the relevant laws and regulations. For a full explanation of the methods used to the modelling see appendix B.

5.3.3 Case study B – data collection on wind energy in east-Germany

This subsection describes in detail the conduction of the case study on wind energy in east Germany and the methods that have been used for data collection, as they were applied between May 2018 and January 2019. We will use this short introductory paragraph to describe the preparatory work.

The experience gained thanks to the conduction of the case study A in southern Italy allowed a smoother organisation of the case study B in east-Germany. Nevertheless, two important differences required a tailored approach, in both methodological and logistical terms. The fact that biogas is a renewable resource entailing the use of land not only as the mere space of production, but also as means of production, through which to exploit agricultural soil productivity, that is a biotic ecosystem service, required methodological adaptation especially in terms of sampling for interviews. Secondly, the language barrier posed a significant complication to fieldwork activities.

The first research activity was to conduct documentary research on the production of agricultural biogas and the cultivation of the energy crops used as fermentation substrata. Thanks to this the fieldwork area was delimited to the federal states of Brandenburg and Mecklenburg Vorpommern. The two states present a combination of large biogas plants and large corn cultivations. This makes them rich in terms of information about territorialised value extraction from renewable energy production in the context of socio-economic marginality.

The fieldwork activities were prepared by a long period of broad-based documentary research started in the winter 2018. As a result, it was possible to clarify the historical and socio-economic context of the case study; to contextualise the fieldwork region in the wider Germany's path towards the institutionalisation of the environment as a policy area; and to form a general understanding of the biogas sector including its functional relation with agriculture.

The conduction of this case study was also prepared logistically through partnerships with local universities, since a dialogue with local scholars was deemed crucial in order to enhance data collection and analysis as an iterative process throughout all the fieldwork phases. Specifically, two partnerships were agreed, with the Friedrich-Schiller University

of Jena and the Humboldt University of Berlin. The partnership with the latter allowed to cooperate with a research assistant who was a native German speaker and therefore to overcome the complication posed by the language barrier.

5.3.3.1 Preparatory interviews with specialised scholars

The knowledge base built through the preparatory documentary research was further extended through loosely structured interviews with academic and non-academic researchers with expert knowledge on the biogas sector in Germany and in the fieldwork region. The experts were selected by using a non-probability purposive sampling. Table 5.4 provides a full list of these interviews which have been pseudonymised on several levels in order to protect participants' identity.

Table 5.4 Preparatory interviews with experts for case study B

Pseudonym	Institution	Interview period
AC/DE-1	Friedrich-Schiller Universoty of Jena	Winter 2018
AC/DE-2	Friedrich-Schiller University of Jena	Winter 2018
AC/DE-3	Humboldt University of Berlin	Winter 2018
AC/DE-4	Humboldt University of Berlin	Winter 2018
AC/DE-5	Heinrich-Böll Foundation	Winter 2018

The interviews served as a first step towards the collection of data. They also provided insights and information necessary to prepare an orderly and effective course of fieldwork activities. They were particularly important in identifying cultural and geographical characteristics; potential risks and difficulties; best strategies to conduct direct observation and access interviewees. During the interviews, potential gatekeepers for interview with biogas project stakeholders were discussed and identified.

5.3.3.2 Interviews with project stakeholders

Interviews with biogas project stakeholders were a core method for the collection of primary data in this case study. By project stakeholder it is here intended any individual that

by reason of the social function he or she performs, or the place he or she inhabits, has an interest potentially or actually either benefiting from or damaged by a biogas project or system of projects, including the cultivation of energy crops used as fermentation substrata.

The selection of potential participants was carried out through a combination of purposive and snowballing sampling. As a first step, two gatekeepers were identified, with whom a double round of interviews was carried out. The first had the form of an open conversation intended to identify other participants. Differently, in the second-round gatekeepers were interviewed as normal participants.

It is important to notice that the language barrier slowed the initial fieldwork activities. Particular difficulties were encountered in contacting potential participants and conducting the interviews. The situation improved significantly thanks to the cooperation with a research assistant who is a native German speaker. Yet, the overall number of potential participants who were actually contacted and interviewed was smaller than for case study A.

By combining evidence from preliminary research and information from gatekeepers, a significant difference emerged from case study A. In this case study the category of landowner overlapped completely with that of farmer, as a consequence of the double function land plays, as both productive space and means of production. Basing on this and other considerations seven categories of informants were identified:

(i) EU level politicians who had carried out investigative or legislative activity regarding biogas production or land dynamics correlated to it, reported in table 5.5 and elsewhere in the text as *EU politicians*

(ii) Individuals with an expert knowledge on either wind energy production, the fieldwork region or both, reported in table 5.5 and elsewhere in the text as *Experts*

(iii) Farmers with or without operative links with biogas production or energy crops cultivation as a result of their professional activity, reported in table 5.5 and elsewhere in the text as *Farmers*

(iv) Farmer-Activists with operative links with biogas production or energy crops cultivation as a result of their professional activity and with present or past involvement in activities advocating or contesting the biogas sector, reported in table 5.5 and elsewhere in the text as *Farmer-Activists*

(v) Project area inhabitant, reported in table 5.5 and elsewhere in the text as I*nhabitants*

(vi) Investors in any of the productive segments or productive cycle of a biogas project, reported in table 5.5 and elsewhere in the text as *Investors*

(vii) *Local politicians* with or without operative links with biogas production or energy crops cultivation as a result of their professional activity, reported in table 5.5 and elsewhere in the text as *Local politicians*

Table 5.5 List of interviews for case study B

Pseudonym	Narrative pseudonym	Interview period
EU politician/DE-1		Summer 2018
Expert/DE-1		Summer 2018
Expert/DE-2		Summer 2018
Expert/DE-3		Summer 2018
Expert/DE-4		Summer 2018
Farmer/DE-1		Autumn 2018
Farmer/DE-2	Peter	Autumn 2018
Farmer/DE-3		Spring 2018
Farmer/DE-4	Ulrich	Autumn 2018
Farmer/DE-5		Autumn 2018
Farmer-Activist/DE-1	Otto	Spring 2018
Farmer-Activist/DE-2	Kora	Autumn 2018
Inhabitant/DE-1		Autumn 2018
Inhabitant/DE-2		Spring 2018
Investor/DE-1		Autumn 2018
Investor/DE-2	Hans	Spring 2018
Investor/DE-3	Frank	Summer 2018
Investor/DE-4		Spring 2018
Investor/DE-5		Spring 2018
Local politician/DE-1		Winter 2018
Local politician/DE-2		Autumn 2018
National NGO's member/DE-1	Veit	Winter 2018
National NGO's member/DE-2		Spring 2018

Through a further purposeful selection of the information provided by the gatekeepers a list of 32 potential participants was compiled, of which 23 were actually interviewed (see table 5.5). A balance amongst the seven different categories of participants was maintained as much as possible in the evolving fieldwork conditions. In this respect, it is important to notice that the initial list of potential participants changed many times and that in multiple cases some of them was contacted and interviewed as a result of direct observation sessions (see subsection 5.3.3.3). Two participants were interviewed that do not belong to any of the above categories and were classified as *National NGO's member*s. Although they were not included in the initial sample, their interview was deemed capable of providing rich context and broad-based information, a supposition that proved true after the interview was actually carried out.

All interviews were pseudonymised on several levels to protect participants' identity. A *narrative pseudonym* was assigned, to those participants from whose interviews fragments were taken and quoted int this thesis, in order to preserve the narrative integrity and fluidity of the text.

The interviews were developed to last up to an hour and were designed following a 'tree and branch' structure (Rubin and Rubin, 2011). The interviews were composed of several blocks. Each of these addressed a different research question. Their aim was to capture information, as well as opinions and perceptions, to interpret, compare and validate through triangulations. An indicative list of questions is provided in appendix A. The main body of the interview was designed to be the same for all categories of informants. However, after the first interviews were conducted it appeared necessary to formulate specific questions for each category of participants, in order to collect perceptions and interpretations correlated to the social positioning of every participant.

5.3.3.3 Direct observation

Similarly to case study A, direct and participant observation played a major role in allowing to access and interview projects stakeholders. Apart from this, through direct observation gradually emerging findings and evidence were elaborated and reflected upon by making sense of the actual spatiality of the fieldwork region. Thanks to directed observation it was possible to combine different sets of information with a lived experience of the fieldwork

places. During the eight months that I spent living in the case study region and travelling from a village to another, every detail of the immersive experience concurred to analysis and interpretation. This applies obviously to the moments that were 'formally' part of data collecting, such as interviews. Yet, moments that were part of the research 'informally' or 'unexpectedly' offered the opportunity for intense interpretive thinking, serving as a very early process of data analysis. Specifically, insightful were observations of the landscapes and their comparison with information provided by participants. Also very valuable was the participation in convivial events where I could enjoy open conversations not necessarily related directly to the research questions, but still relevant to the construction of a broad-based knowledge. While this 'informal' activity was extensive in time length, it also was considerably dense in terms of early processed information. During observation, both shorter and longer field notes were written.

5.3.3.4 Documentary research

Documentary research accompanied all the data collection phases, as an on-going method to gather new information but also to validate data collected through other methods. Seven categories of documents were analysed, such as regulatory documents from local, regional and national institutions, court judgements, press reports and articles in written or video form, minutes of local institutions and specialised agencies boards, parliamentary hearings, companies and investors reports.

5.3.3.5 Descriptive statistics

Where possible, qualitative information was interpreted, cross-checked, and complemented through descriptive statistics. The resources included public databases such as those provided by DESTASIS, Germany's national statistical office and EUROSTAT, EU's statistical service. Data were complemented with databased provided by public specialised agencies. Particularly useful were the databases compiled by the Renewable Energy Agency and the Federal Network agency regulating, amongst other, access to the electricity and gas grids.

5.3.3.6 Economic modelling

Value extraction and redistribution mechanisms and volumes of biogas projects presented in the subsection 8.3.4 of chapter 8 were assessed and quantified through a feasibility

calculator provided by the Board of Trustees for Technology and Building in Agriculture eV (KTBL)[38]. That is a research institution under the aegis of Agency for Renewable Resources, which is a branch of the Federal Ministry of Food and Agriculture. Additional information retrieved from relevant regulations was used.

5.3.4 Data analysis

As this research is founded on a historical materialist epistemology, the data analysis process was informed by the categories of that philosophical tradition. The most important implication is that methods and techniques for analysis were selected and designed following primarily, yet not uniquely, a deductive reasoning. This approach was also deemed the most effective toward this research overarching purpose of contributing to historical materialist debate both in general terms and with specific reference to the research goal and questions.

On this premises, a comprehensive approach based on deductive coding was applied to the analysis of the evidences obtained from the methods described above (Potter and Levine-Donnerstein, 1999; Hsieh and Shannon, 2005). The first step was to identify key categories and variables from the broad historical materialist framework and adapt them to the research goal and questions. As a result, five raw analytical categories were identified, such as hegemony building mechanisms; territorially based class cleavages; alliances around value extraction; enclosure mechanisms; socioecological transformations. These purely theoretical categories were applied to documentary analysis in order to derive themes refined through secondary information from documents. The themes were then used to approach the analysis of interviews.

The formation of analytical elaborations on interviews was a multi-layered process started in the very moment interviews were conducted. Nevertheless, the density of analytical elaborations increased substantially with the transposition of interview notes or voice recordings into organised transcripts. This was an ongoing recursive activity, which allowed to build a grid of codes and themes, incrementally refining its capability to capture fine-grained details while contextualising them within the wider geo-historical dialectics.

[38]The calculator is available at https://daten.ktbl.de/biogas/navigation.do?selectedAction=Startseite#start

Specifically, once the first transcripts were completed, the themes derived through theoretical and documentary analysis were applied and disassembled into codes. As the number of coded transcripts increased, the codes progressively improved in sophistication. Once coding was completed, codes could be reassembled into new, empirically tested, overarching themes. As a further step, the interrelations amongst them were traced with the aim of drawing conceptual maps. On these maps particularly evocative interview excerpts were also included, so as to create a reconstruction coherently dialectical, by anchoring within a single visual tool empirical material and analytical elaborations. On this basis, it was possible to let new questions, gaps and avenues for research emerge. These were investigated through further rounds of purposefully oriented theoretical and documentary analysis, supported through descriptive statistics, and continuously maintained in dialogue with the interviews. Furthermore, the analysis of field notes and the writing of ongoing reflections was an extremely valuable source of insights which helped complement and strengthen the whole analytical process by allowing iterative interpretation, clarification, and reframing.

5.4 Ethical and positionality aspects of this research

This section discusses the ethical and positionality implications of this research and the actions undertaken to address them. It aims at clarifying how ethical and positionality considerations influenced the methodology and therefore the findings of this research (Silverman, 2013).

5.4.1 Ethical aspects and actions to address them

The research was designed and conducted in accordance with the Research Ethics Policy of University of Leeds and the applicable UK and international law. As a result, the principles of a prior and informed consent; protection of confidentiality and minimisation of risks in which both the subject-participants and the researcher may incur were observed throughout the research cycle.

A part of the interviews was audio-recorded, while another was recorded through written notes. For a small number of them no audio or written record was taken at the moment the interview was taking place. All audio-recordings or written notes containing sensitive

personal information, such as details on identity was stored in line with the requirements of the Research Ethics Policy of University of Leeds. In the case of audio-recorded interviews, participants' identity was pseudonymised at the moment of transcription which in some case happened days after the interview. In the case of written-recorded interviews participants' identity was pseudonymised immediately after interviews. In both cases a double level pseudonymisation was carried out, so to ensure a higher level of protection to participants' identity.

5.4.2 Reflections on my positionality

The concept of positionality implies that the historical, geographical, social and cultural conditions throughout which a researcher personality and expertise have developed influence the research process itself (Hammersley and Atkinson, 1995; Malterud, 2001). This should be read in relation to that of rigour, which is an inescapable condition for every credible piece of research and scientific work. It is beyond doubt that this rests on a sound and coherent research process, from ideation, to design, conduction and writing. Yet, this can be hampered by overt or veiled claims of neutrality and the absence of an open discussion about the researcher's social background. If everything is inherently contradictory, following Hegel (1969), then there is no such a thing as neutrality.

Historical materialism as a philosophical tradition is particularly familiar with such an understanding. It stems from the critique of the *naturalisation* of social phenomena, and by extension, class differences and inequalities. By using historical materialism as a theoretical framework and epistemological approach I have chosen a precise positionality within the debates in human geography and more broadly social sciences and humanities. Such a positionality is that of research looking at reality as a dialectical socio-historical processes in which there are deeply rooted social inequalities. Although research is conceived as an autonomous activity, the very act of knowing is intended as profoundly transformative and by implication inherently political. In this regard, memorable are Gramsci's writings on the role of intellectuals in the construction of hegemonic mechanisms (Gramsci, 1975).

My positionality as a researcher has been deeply influenced also by a two-decade active participation in social and environmentalist movements. This facilitated substantially the organisation of fieldwork activities. Thanks to activist networks of which I have been part

or with which I have been in contact, I could identify some of the participants. As an activist I gained more easily the trust of participants who were also activist. On the other hand, especially in the phase of analysis I needed to make myself fully aware of my positionality as an activist in order to thoroughly interpret and triangulate information from interview.

5.5 Conclusions

This chapter has provided a comprehensive explanation of the methodology for this research. The second section has illustrated the long intellectual process of research ideation with a focus on research design, main goal and guiding questions. The third section has presented the research methodology for both data collection and analysis. The fourth section has discussed the researcher's ethics and positionality.

Now that full information about the theoretical and methodological structure of this thesis are provided, its empirical analysis and findings can be presented in the next three chapters. The first and following one focuses on the political-economic patterns that have enabled the extraction and accumulation of surplus value in and around renewable energy in the EU and the national contexts of the case studies.

Chapter 6 – Ecological modernisation and renewable energy governance in the EU and the case study national contexts

6.1 Introduction

This chapter explores the emergence of ecological modernisation as a policy approach to the governance of renewable energy generation in both the EU and the national contexts of the case studies of this research. It aims at explaining the regulatory and institutional systems, and the historical processes from which they result, enabling the extraction and accumulation of surplus value in and around renewable energy, as 'green' capitalism in action.

The chapter is organised into three sections. The first shows how the consolidation of the 'environment' as a policy field and accumulation horizon has informed the renewable energy governance as it takes place today in the EU. The second and third illustrate the rise of ecological modernisation as the dominant policy approach and theoretical framework informing the renewable transitions both in the Italian and German contexts, with a specific focus respectively on wind energy and biogas generation. They show how government's concerns for energy security and early environmental contestations, especially around the use of nuclear energy, have combined with the national and EU regulations in making 'green' accumulation around renewable energy possible.

6.2 Ecological modernisation in the EU

This section discusses the formation and evolution of a renewable energy governance in the EU. It is organised into two subsections. The first describes the rationality underlying the EU environmental policy, as the broader field wherein the renewable energy governance is framed, by exploring the Environmental Action Plans (EAPs). The second concentrates specifically on renewable energy governance delving into the dialectic between historical and political dynamics and policy making.

6.2.1 From costly burden to accumulation horizon: the 'environment' in the Environmental Action Programmes of the EU

EAPs are programmatic, non-legislative documents providing the medium to long-term goals in the area of EU environmental policy. Although they do not have the force of binding regulations, they set out the strategic policy frameworks on which actual regulations are based. For this reason, they represent a formidable observation field through which to interpret the tendencies and transformations of environmental discourses within the EU institutions and in the member states overall.

The 1958 Treaty of Rome establishing the European Economic Community (EEC) did not include the protection of the environment amongst fields for common regulation. It took until the 1972 Paris Summit for EEC member states to take a clear step towards environmental protection, inviting the EEC's institutions to prepare a "programme of action" on the field within one year of declaring in the summit final statement that

> "Economic expansion is not an end in itself […] particular attention will be given to intangible values and to protecting the environment, so that progress may really be put at the service of mankind" (Bulletin of the European Communities, 1972 p. C 112/5)

The first EAP was presented in 1973 and combined environmental protection with an approach oriented to economic efficiency (Baker, 2007; Machin, 2019). More specifically, it introduced the 'polluter pays' principle, stating that "the cost of preventing and eliminating nuisances must *in principle* be borne by the polluter [emphasis added]" (Official Journal of the European Communities, 1973 p. C 112/6). Yet, this principle was qualified by a wider belief that "environment policy can and *must be compatible* with economic and social development [emphasis added]" (ibidem). This caveat established a hierarchy of commitment, recognising socio-economic policies as taking priority over environmental ones, and laid an early rational basis for the systematization of *sustainable development* within the framework of ecological modernisation (Machin, 2019). At this initial stage, the rationalities underpinning the EU environmental policy were reparatory and repressive, emerging more as a reaction to major polluting events than from a comprehensive *ex-ante*

programmatic approach. An eloquent example is the Seveso Directives[39] meant to control the hazards deriving from the use of chemical dangerous substances[40]. The turning point was the third EAP between 1982 and 1986, which for the first time envisaged potential economic benefits of environmental protection on the EEC's industrial policy:

> "[…] certain measures, for fighting pollution and exploiting waste, could stimulate technological innovations and so contribute to improving the competitiveness of the Community's economy" (Official Journal of the European Communities, 1983 p. C 46/5)

As Machin (2019) notices, this marked an epochal change in environmental and economic policy terms. The environment was no longer framed as a source of costs generated by its protection, but instead as a reservoir of revenue opportunities. As a guiding principle definitively established for all future legislation, environmental policy was now an instrument to enhance the EEC's, and later EU's, economic competitiveness, and must be integrated within the wider economic policy framework. This simple yet revolutionary principle signals the irreversible affirmation of ecological modernisation as the dominant framework for the EU environmental policy. This had become even more visible with the fourth EAP (1987-1992), with employment *creation* now mainstreamed throughout to underline the expansive potential of the environment as an accumulation horizon. Particularly evocative is an introductory paragraph of the document:

> "[…] environmental protection policy can contribute to improved economic growth and job creation [emphasis added]. In the past environmental requirements have often been seen as merely imposing regulations and costs [emphasis added] on industry, agriculture, transport, etc. Now, in a world where higher environmental standards are more and more being required, the achievement of such standards must increasingly be seen as an essential element in the future economic success of the Community [emphasis added]. The European Council went on to affirm its determination to give [environmental] policy the dimension of an essential component of the economic, industrial, agricultural and social

[39] The Seveso directives are as follows: Council Directive 96/82/EC; Seveso II and III 2012/18/EU.

[40] The directive name comes from Seveso, a town in the surroundings of Milan in northern Italy. There, in 1976 an explosion in a chemical manufacturing plant caused the dispersion of a dioxin cloud over a large area.

> policies implemented by the Community and by its Member States" (Official Journal of the European Communities, 1987 p. C 328/7)

The fifth EAP (1993-2000) makes an explicit reference to *sustainable development* in its very title, which is "Towards sustainability" (Official Journal of the European Communities, 1993). The international debate triggered by the publication of the Brundtland report in 1987 (see chapter 1) and the changes brought by the Rio Earth Summit in 1992 were reflected in the EAP with the "tolerance limits of the environment" (Official Journal of the European Communities, 1993 p. C 138/96) explicitly mentioned and correlated with social inequalities. The EEC acknowledged that its own inhabitants consumed a "disproportionate share of the world's resources" (idem, p. C 138/20), and that the industrialised countries would need to make

> "[…] a substantial change in consumption patterns so as to reduce their share in the use of the world's natural resources, while at the same time ensuring a steady improvement of the quality of life" (idem, p. C 138/84).

Yet, apart from these declaratory statements, the main novelty of the fifth EAP lies somewhere else: for the first time it introduced in the ECC institutional debate the definition of the ecosystem as a "natural capital stock" whose "value" should be preserved though "cost/benefit evaluation criteria" (idem, p. C 138/12).

The sixth EAP (2001-2010) expanded the notion of natural capital by framing it in conjunction with that of ecosystem service accounting. It also introduced a classification of policy priority actions, such as: climate change; nature and biodiversity; environment, health and quality of life; and natural resources and waste. This coupled with a set of new measures setting overarching objectives and different cross-cutting strategies and plans, which however lacked an effective implementation and monitoring system, translating into poor results.

In 2014 the seventh EAP entered into force until 2020. Along the lines of the previous ones, the EAP established ecosystem accounting and decarbonisation through technological innovation as the core objectives of the EU's environmental policy. The strategies envisaged to achieve these objectives were fully framed around a growth of 'green' investments and an ancillary integration of environmental policy into economic policy goals.

In this section we have analysed the emergence of ecological modernisation as a policy approach in the EU using the Environmental Action Programmes as a field of observation. In the next section we will discuss its application to the governance of renewable energy generation.

6.2.2 The EU's governance of renewable energy generation

This section analyses the EU governance of renewable energy generation as it is framed within the broader neoliberal architecture of the European Single Market. Specifically, it shows that the framing of renewable energy transition, within a general process of energy production and distribution liberalisation, has been shaped by frictions between the EU's institutions and the member states, reflecting a repositioning of capitalist class factions around the new accumulation opportunities opened by the transition itself. The section is organised into three subsections. The first and the second review the regulatory basis of the renewable energy generation governance, which in turn is discussed in the concluding subsection.

6.2.2.1 The legal and institutional basis

Up until 1987 the EEC's environmental legislation consisted in single measures lacking a clear systematisation within the Community juridical framework. Specifically, norms setting the procedures for, and therefore the institutions in charge of, producing environmental policies, as well as indicating their ranking in the hierarchy of sources, were not in place. The legal vacuum was filled by the 1987 Single European Act (SEA). This major revision of the Treaty of Rome elevated environmental protection to the rank of a general provision of the reformed treaty. A power to legislate on environmental matters was then entrusted to the Community institutions, although it was shared with member states. Environmental matters to be normed at the Community level could be identified through an unanimity procedure and then regulated through a qualified majority. Further changes were introduced by the Treaty of Maastricht in 1993. The unanimity procedure was restricted to fewer matters, streamlining legislation mechanisms. Importantly, the Treaty of Maastricht marked the evolving of the environmental policy towards an ecological modernisation framing, as signalled by the introduction of *sustainable growth* as a guiding concept (Official Journal of the European Communities, 1992). With the reforms brought with the

Treaty of Amsterdam in 1997, sustainable growth was replaced by *sustainable development*. This is defined as a principle to be fulfilled "within the context of the accomplishment of the internal market" (Official Journal of the European Communities, 1997 p. 1) and to be applied to the internal and external actions of the European institutions (Baker, 2012).

6.2.2.2 The liberalisation of the energy market

If the systematization of an European environmental policy developed in parallel with the establishment of a European single market, so did the harmonisation of a governance framework for renewable energy, inasmuch as it was based on the liberalisation of national energy markets and their unification into a *European energy market* (Pollitt, 2012; 2019). This long and still on-going process has set the regulatory conditions for investment, and accumulation, around the production of renewable energy to take place.

Looking at the electricity sector, we can see that the European Single market in electricity was instituted through three distinct directives in 1996 (96/92/EC), 2003 (03/54/EC) and 2009 (09/72/EC). Although the directives aimed at extending wholesale and retail competition requiring utilities to unbundle electricity production and transmission, the actual result was the strengthening of market concentration at the EU level, with a small number of utilities in dominant position. With the integration of national electrical systems into a European electrical system happening at different speeds across the national markets (Pollitt, 2012; 2019), a small number of utilities were able to significantly intensify their cross-border operations within the single market and formed a deeply integrated energetic complex controlling both fossil and renewable energy production (ibidem).

A concentrated market dominated by large utilities has contributed to slowing an EU-wide grid renovation, as a necessary infrastructural prerequisite to decentralise - and democratise - the energy production system. While a full decentralised production is a technical possibility with renewable energy sources, which are characterised by a lower power density and are therefore distributed over larger territorial extents (see chapter 2), that would shrink large utilities' grip on the market (Solorio and Bocquillon, 2017; Solorio and Fernandez, 2017; Vogelpohl et al., 2017; Midttun, 1997). We should notice that most of these utilities have close historical ties with member states' governments, by reason of the

strategic role energy production plays. In most cases, they are the successor companies of former public owned corporations, with government's direct control turned into some form of state-owned majority shareholding, as required by the neoliberal architecture of EU's juridical framework. Therefore, member states' strategic interests have often overlapped with those of energy utilities such as EdF, RWE, E.ON, Iberdrola, ENEL or Vattenfall. As a result, member states have maintained infrastructural systems and regulatory models that have favoured a centralised organisation of energy production, while resisting Community norms that would encourage energy production decentralisation and the affirmation of a prosumer-based model, with a substantial energy consumers' participation in production (Solorio and Bocquillon, 2017). In this regard, a significant reform was introduced by the directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity, which finally promotes production decentralisation, still within a market paradigm. The directive text is particularly clear in stating that:

> "Member States shall ensure that their national law does not unduly hamper […] consumer participation, including through demand response, investments into, in particular, variable and flexible energy generation, energy storage, or the deployment of electromobility or new interconnectors between Member States, and shall ensure that electricity prices reflect actual demand and supply" (Official Journal of the European Communities, 2019 p. L 158/143)

6.2.2.3 The promotion of renewable energy: a historical process between fragmentation and Europeanization

An EEC institutional interest for renewable energy sources can be traced back to the late 1970s. Its origin coincides with two traumatic events. In 1973, the outbreak of the Yom Kippur Arab-Israeli conflict led the Arab governments to retaliate against the United States and other western industrialised countries for their support to Israel. The Organisation of Arab Petroleum Exporting Countries (OAPEC) imposed an oil embargo resulting in a 70 percent price upsurge, and a key driver of the mid-1970s economic crisis. In 1979, a second energy shock followed the oil supply cut caused by the Iranian revolution. The restructuring of international power balances resulting from these historical dynamics exposed how

fragile the capitalist West's energy regime was, being so dependent on oil, a fossil source on which it had little control (Ikenberry, 1986; 2018).

The breaking of the international equilibria which had allowed to feed the post-war recovery with cheap oil left western governments a narrow room for manoeuvre, between opening new oil supply chains and differentiating the energy source portfolio. Along with their western allies, EEC member states' strategies were fully driven by security concerns, with no space for ecological considerations, hence regarding renewable sources as a mere alleviation to their strategic dependency on oil (idem). In short, it was not their renewability that mattered, but only their being *alternative sources* to oil as much as coal and uranium were, although with the disadvantage of being -differently from the latter which could be developed at an industrial scale in the shorter term- still at an experimental stage (see chapter 1 and Nilsson, 2011)

In this context, the European institutions led by the Commission (EC) launched the goal of a less vulnerable energy regime, financing research and demonstration projects in the fields of energy efficiency and renewable sources. Yet, their scale was checked by member states' resolve to maintain control on energy supply. The promotion of renewable sources expanded slightly during the 1980s, mainly as a consequence of its integration into EEC's development schemes for poorer regions, such as the VALOREN programme (Solorio and Bocquillon, 2017).

In the early 1990s, climate change, which had already become the most emblematic environmental issue and an increasingly central policy theme for the EEC, changed radically the fate or renewable sources, transforming them from an option to strengthen energy security, dwarfed by nuclear and coal, into a crucial solution to the climate crisis. In 1989 and 1990 the EC initiated respectively the JOULE and THERMIE programmes, which, amongst others, aimed at promoting research and demonstration on renewable energies (idem). A few years later, in 1993, with the background of the Rio Summit, the EC established the ALTENER programme expressly intended to promote renewable sources, lasting until 1997. Again, EC's initial ambitions were curbed by member states' conflicting interests and ALTENER was limited to research and demonstrations policies, setting only indicative targets of 8 percent renewable energy in total EU primary energy consumption and 5 percent biofuels in transportation fuels by 2005 (Skjærseth, 1994; Vogelpohl et al., 2017).

At this stage the EU programmes were substantially smaller and less ambitious than their national counterparts. Pioneering member states such as Denmark (1986), Portugal (1988) and Germany (1991) had already upgraded their programmes promoting research and demonstration on renewables to actual subsidy policies. Other states would soon follow, such as Greece, Luxemburg, and Spain (1994), and Italy (1996), all with schemes based on Feed-In-tariff mechanisms (FIT; see table 6.1). Similarly, the UK (1990) and later Ireland (1996) and France (1996) introduced subsidy policies but based on tendering systems (see table 6.1 and also Bruns et al., 2011; Solorio and Bocquillon, 2017).

A push towards overcoming the impasse came from an EC white paper published in 1997 and titled "Energy for the future: renewable sources of energy". The paper set out an indicative 12 percent target of renewable energy in EU primary energy consumption by 2010 and, most importantly, proposed to harmonise the renewable subsidisation across the EU through a fully market-based system of *tradable renewable energy certificates* (TCGs). A crucial role was also played by the 2000 European Climate Change Programme, for the implementation of the EU's commitments under the Kyoto protocol. In the background, early 2000s oil and gas price surges were exposing weaknesses of energy security at both the EU and the National level (Solorio and Morata, 2012).

In this context, the EC put forward two draft legislations to promote renewable energy, one for renewable electricity and another for biofuels. The approval of 2001/77/EC directive for the promotion of renewable electricity was the first outcome, although it arrived after a long and convoluted negotiation process, with member states striving to protect their domestic economic and energy policy goals as much as they could (Midttun, 1997; Midttun and Koefoed, 2003). As a result, the final text reflected the prevalence of national interests over an effective policy coordination at the EEC level. This is clear from three issues. First, the directive definition of renewable sources included traditional hydropower and industrial waste, so making national targets easier to reach. Second, the directive only set indicative targets, with the community-level one at 22 percent of total EU electricity consumption by 2010. Third, it did not introduce any EU-level subsidy system based on TGCs, as proposed by the EC. This option was fiercely opposed by countries such as Germany and Spain with a FITs system already in place (Vogelpohl et al., 2017; Solorio and Bocquillon, 2017).

In fact, the EC was particularly averse to FITs, allegedly fearing its distortive effects on competition and the EU single market. Eloquently, EC's position was backed by fossil-based energy utilities, which considered FITs as a threat to their core business (Vogelpohl et al., 2017). This interest convergence became openly manifest in Germany after the entering into force of the 1991 country's Renewable Energy Sources Act (StrEG - see subsection 6.2.2.3). The act imposed to regional distribution companies to buy electricity generated from renewable sources located in the area of operation and pay a fixed minimum price. The additional costs were to be borne by energy suppliers. In this contexts, Preussen Elektra AG, an energy supplier, sued Schleswag AG, a regional distribution company, before the European Court of Justice (ECJ). Preussen Elektra AG argued that the amount it paid pursuant to StrEG qualified as an impermissible state aid under the EU law. Preussen Elektra's case was also supported by the European Commission. Nevertheless, in 1998, with the landmark PreussenElektra AG v Schleswag AG ruling, the ECJ decided that the fund transfer in question was not to an impermissible state-aid, since it did not involve any direct or indirect transfer from state budget (Vogelpohl et al., 2017; Bruns et al., 2011), indirectly declaring FITs as perfectly legal.

Table 6.1 Types of subsidy schemes for renewable energy generation

Incentive scheme	Operating model
Feed-in-tariff (FiT)	FiTs provide a fixed payment per unit of electricity produced (MWh) for a fixed period. They minimise risk for investors by covering costs (generally based on the levelised cost of energy) and profit, and shielding them from developments in the electricity market. Some experts highlight that FiTs have incentivised large RES development, but often at a high cost.
Feed-in-premium (FiP)	FiPs pay renewable energy generators a premium price, in addition to the energy wholesale price. With FiP, the payment to RES producers depends in part on the electricity market. Compared to FiTs, FiPs reduces volume of subsidies paid.
Tender or auction schemes	Rather than a distinct subsidy scheme, these are allocation mechanisms. The government sets a maximum quota of energy that will be subsidised through FiTs or FiPs schemes and distributes it to the highest bidders.
Quota obligations and Tradable Green Certificates (TGCs)	This type of subsidy is fully market-based.The government sets a renewable energy quota obligation for specific industries with a high GHG emission rate. Thes can either cover this quota by using renewable energy or by buying a Tradable Green Certificate, which are held and sold by renewable energy producers, who accumulate them correspondingly to the quantity of renewable energy they generate.

Convoluted were also the negotiations leading in 2003 to the approval of the directive 2003/30/EC on the promotion of biofuels and other renewable fuels for transport. Member states with an already developed biofuel industry and a large agricultural sector (such as Austria, Germany, France, Italy, Spain and Sweden), alongside the EC and the European Parliament, advocated for setting binding targets. They were opposed by member states with a limited agricultural sector and an internal public opinion sceptical about the sustainability of biofuels (such as Denmark, the Netherlands and the UK). Eventually, the approved text only instituted a non-binding target of 2 percent biofuel in total transport fuels by 2005, increasing to 5.75 percent in 2010 (Vogelpohl et al., 2017).

In the second half of the 2000s, energy security concerns, further exacerbated by the 2006 tensions between Ukraine and Russia and its impacts on gas supply and interplaying with ever-clearer scientific evidence on the climate crisis and its disastrous social and economic implications, were crucial in building a momentum for a stronger promotion of renewable energies. This paved the way for the introduction of the 2009/28/EC directive, commonly known as the 202020 directive or Renewable Energy Directive (RED). Arranging a harmonised European-wide policy to support RES was still central to negotiations prior to the approval. The EC reiterated its support for an EU-wide TCGs system (Solorio and Morata, 2012; Solorio and Bocquillon, 2017). On the other hand, Spain and Germany maintained their opposition, proposing rather that member states could choose autonomously the supporting policy of preference in coordination with broader EU-level objectives. To strengthen their strategy, Germany and Spain coordinated with renewable energy producers' organisations, such as the European Renewable Energy Council (EREC) and the European Renewable Energy Federation (EREF). Eventually, the RED directive did not impose any EU-wide subsidy system, letting member states free to choose the supporting policy they preferred. On the other hand, for the first time the directive set binding targets for both the EU and member states of 20 percent emission curb; 20 percent energy saving from increased efficiency; and 20 percent renewable energy in the EU total final consumption to be achieved by 2020.

The directive also included a binding target of renewable sources in transport fuel consumption. The initial EC's plans envisaged a 10 percent biofuel target. This was later revised as a result of harsh political tensions around biofuel environmental and social

sustainability. In the mid-2000s opposition to biofuels was relatively limited to environmental activist networks, large NGOs such as Greenpeace and the WWF, and the Greens in the European Parliament. The situation changed with the food price crisis in 2008, widely correlated by commentators to the increased demand for energy crops and their competition with food production (White and Dasgupta, 2010; Hunsberger et al., 2017). As a major consequence, the crisis triggered global scale food riots shaking peripheral countries, from north Africa to the Caribbean. This gave biofuel opponents strong leverage. Furthermore, they could also count on an increasing number of studies showing how indirect land use change (ILUC) provoked by energy crop cultivations substantially reduced or even nullified biofuel effectiveness in curbing GHG emissions. As a final agreement, the 10 percent biofuel target was turned into a 10 percent renewable resource target, including for instance electric cars; and a system for biofuel sustainability assessment was introduced, although ILUC considerations were scrupulously kept out of the assessment criteria (Bruns et al., 2011).

The negotiations of 2030 targets were characterised by member states' attempts to take back control over their energy policy. This happened in a context of national government austerity in response to the early 2010s sovereign debt crisis and the related criticism towards the costs of renewable energy subsidisation. In this situation, a group of member states seeking more flexibility in energy policy proposed to scale down the EU legislation and set only an EU-wide target. This position, led mainly by the UK and France, gained support and in October 2014 the European Council approved a 2030 Framework for climate and energy, setting only a 27 percent EU-wide binding target for renewable energy consumption and 27 percent indicative target of energy efficiency improvement, coupled with a 40 percent GHG emission cut compared to 1990 level. A few years later, the recasting of RED known as REDII and the Directive on Energy Efficiency both approved in 2018, raised renewable energy and energy efficiency targets to respectively 32 percent and 32.5 percent. REDII also included ILUC criteria in the biofuel sustainability assessment framework, capping conventional biofuel use at 7 percent by 2030 (Solorio and Bocquillon, 2017).

The energy policy re-nationalisation tendency signalled by missing national targets was partially counterbalanced by the EC's 2014 Environmental and Energy Aid Guidelines which

eventually achieved the harmonisation of EU subsidies, by declaring FITs for industrial scale plants definitively illegal and providing their progressive replacement with fully market-based systems, such as Feed-in-premiums (FIPs, see table 6.1) and TCGs (Vogelpohl et al., 2017).

The last stage of this process at the time of writing is the proposal of an action plan touted as the 'European Green Deal'. According to official sources the plan is intended to "[1] boost the efficient use of resources by moving to a clean, circular economy [and 2] restore biodiversity and cut pollution". While EC's president Ursula von der Lynden has described the plan as "Europe's man on the moon moment"[41] and its actual potential against the declared aims will be assessable only in the coming years when the related regulations will near the approval, it is already possible to observe its full framing within the paradigm of ecological modernisation and neoliberal governance, with the financing of private capitals to implement the ecological transition (Bloomfield and Steward, 2020)

This section has illustrated the organisation of renewable energy governance through the principles of ecological modernisation and within the construction of the European single market. Specifically, it has described the development of support mechanisms and policies as an arena traversed by frictions and conflicts.

6.3 Ecological modernisation in Italy and wind energy generation: a top-down contested process

This section explores the emergence of renewable sources, and specifically wind energy, within the restructuring of Italy's energy regime following the 1970s oil shocks. It discusses their progressive integration within the broader liberalisation and privatisation processes transforming the Italian capitalism since the 1980s. To the purpose, the first subsection contextualises renewable energies within the debates around alternatives to oil, between government's concerns for energy security and early environmentalist contestations of the

[41] President von der Leyen's used this hyperbole on the occasion of the adoption of the European Green Deal Communication, on the 11th of December 2019. The entire speech is available at https://ec.europa.eu/commission/presscorner/detail/en/speech_19_6749

nuclear option. The second subsection delves into the Italian renewable transition focusing on the interrelation between policies and accumulation patterns.

6.3.1 Alternative energies as a contested field

Similarly to other European countries, Italy's post-war reconstruction was fed mainly through oil and oil products. This energy regime was changed abruptly by the 1970s oil crises leading the Italian government to look at atomic energy as the main solution for a new energy security. (Ikenberry, 1986; McGowan, 2011; Bösch and Graf, 2014).

To be sure, three atomic plants were in operation in Italy since mid-1960s. They had been built by private investors and a state-owned company (Della Valentina, 2011). Yet, in 1962 the country's energy system was nationalised and its monopolistic control entrusted to a public corporation, the National Body for Electric Energy (Ente Nazionale Energia Elettrica, from now ENEL). This curbed industry's appetite for investing in nuclear energy.

The situation changed again in 1975 with the government's first National Energy Plan (NEP), providing for 20 new nuclear plants. This decision was met by opposition from parliament and civil society, resulting in the scaling down of the initial project to 12 new energy plants of which only eight were planned to be powered by atomic fuels (Della Seta, 2000; Armiero and Barca, 2004; Della Valentina, 2011).

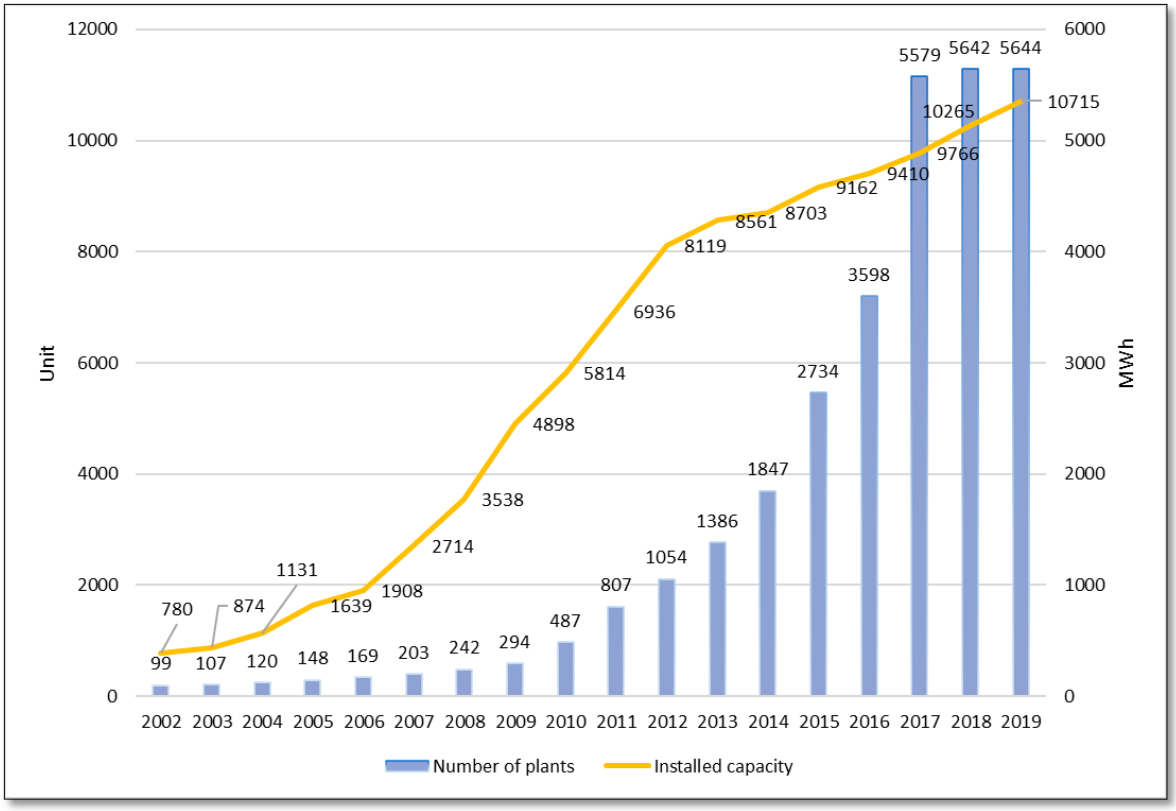
By 1977, a mass antinuclear movement had been born, influenced by the 1960s contestations in the context of the Italian workerism and worker's autonomy movement (*Autonomia Operaia*; see Tronti, 2013; Bianchi, 2004). In March of the same year, in Montalto di Castro, a town in the northern part of Lazio region on the borders with Toscana region, a mass demonstration opposed the building of a 2TW nuclear plant, potentially the largest in Europe (Camilli, 2018; Armiero and Barca, 2004; Della Seta, 2000). While nuclear energy was held by industry and the government as the most efficient solution in terms of energy security, it was depicted as a source of emergency and insecurity by antinuclear discourses by reason of the environmental and social hazard it posed (Della Seta, 2000; Armiero and Barca, 2004; Della Valentina, 2011). As autonomia operaia's revolutionary militants joined with non-violent pacifists, a politically and culturally stratified antinuclear movement,

mixing anti-capitalism, socialism, humanism, and eco-pacifism[42], would spread throughout the country over the next decade. As a major consequence, in 1987, a year after the Chernobyl disaster, a national referendum voted to halt Italy's road to nuclear energy[43] with an overwhelming majority (Della Seta, 2000; Armiero and Barca, 2004; Della Valentina, 2011).

Out of the anti-nuclear movement, ideas around renewable energy started to circulate. The following is an extract from a leaflet at the 1977 demonstration in Montalto di Castro:

> "The white man says he wants nuclear plants to produce energy. *But he dislikes sun energy, which is clean and costs nothing* [emphasis added]. We Indians from the hills summon our brothers from the city, who have bravely fought in the universities, to our aid to make in Montalto the celebration of our life, and a celebration of new spring, against the eternal winter of the white atomic power" (Camilli, 2018)

Figure 6.1 Growth of wind energy generation in Italy



Source: TERNA – Rete Elettrica Nazionale and GSE

[42] In 1983, the Government's decision allowing the deployment of US strategic nuclear warheads in a military base in Comiso in Sicily, triggered a wave of intense demonstrations against the use of Italian soil for nuclear warfare.

[43] Again between 2005 and 2008, an oil price surge induced the Government to advance a new nuclear program. It was cancelled by a referendum in 2011, by a 94 percent majority.

The quote gives us a glimpse about how inextricably the critique to atomic energy translated directly into a contestation of the broader society. The leaflet's authors defined themselves as Indians, in connection with the *metropolitan Indians*, a hippy small faction of the late 1960's movements using northern native Americans' iconography as their trait. The "Indians from the hills" stood for a de-commodified sun energy and wanted to celebrate a new spring, a season when life awakens. On the contrary, nuclear power was paralleled to winter, whose cold restricts life, under the control of the "white man". In what recalls an antiracist syllogism, nuclear power comes to embody the incompatibility to life as such.

It is worth noting how none of this radical vision inhabits today's regulatory framework governing renewable energy production in Italy. Quite the opposite, renewable sources have been sanitised from the revolutionary poison and fully subsumed into capital accumulation strategies, by operation of ecological modernisation theories (see chapter 2 and Hajer, 1997; Toke, 2011). This *heterogenesis of purposes* we will discuss in the next subsections.

6.3.2 The institutionalisation of renewables as a source of energy and profit

The lively and heated debate about the energy regime within the Italian civil society was matched by a slow discussion within both the parliament and the government. Since 1975, government's energy strategy was set out in the NEP (see above) which was amended in 1977, 1981 and 1988 (Della Seta, 2000; Della Valentina, 2011). With the nuclear option becoming less and less likely, the NEPs identified coal and natural gas as the main sources. In this context, renewables started to come to the fore as an option to develop. The 1977 NEP mentioned solar energy for the first time, while envisaging "the space for a coordinated programme of research and demonstration" for wind energy (Italian Parliament, 1981 p. 56). NEP's indications were translated into the 308/1992 law, which also provided a legally binding definition of renewables sources[44].

[44] The 308/1982 stated that renewable sources include: "the sun, the wind, the tides, the wave power and processing of either organic and inorganic waste or vegetable products". It also envisaged sources equated to renewables, which included: "the heat recovered from electricity generation plants, exhausted fumes as well as thermic plants and industrial processes, as well as other forms of energy recoverable in processes or plants".

Most importantly, the law derogated from the 1962 nationalisation statute (see above) and recognised the possibility for industrial plants to produce renewable energy for self-consumption, with an obligation to sell excess production to the national grid under ENEL. The law also introduced the first scheme subsidising investment in both renewable energy generation and energy efficiency in housebuilding. The 1988 NEP marked a further breakthrough stipulating that by the year 2000 new wind energy capacity, ranging from 300 to 600 MW, should be installed. This target had been announced during the European Wind Energy Conference (EWEC) held in Rome in 1986 and organised by the association representing the rising European wind industry. For the first time, the government sent a clear signal to wind energy technology manufacturers and plant developers that renewable energy from wind would be supported as a commercial endeavour (Della Valentina, 2011; Dalpane, 2015).

The path traced by the 1988 NEP was followed in 1991 by law 9, which facilitated the privatisation of the Italian energy system, making energy supplied from renewables the first energy production segment accessible to private capital. To attract private investment, the government introduced a subsidy scheme, known as CIP 6/92, based on a FIT system (see table 6.1). A *Power Purchase Agreement* (PPA) guaranteed that produced energy would be bought by ENEL, removing the demand risk for the commercial companies. This institutional backing reassured the financial markets, and lenders started to pump in interest bearing capital through a variety of lending schemes.

With state legal and financial support enhancing wind-projects bankability, the Italian wind energy sector began a sustained period of expansion. By 1997, ENEL had signed contracts binding it to buy energy under the CIP 6/92 scheme from plants totalling an installed capacity of 691 MW, 500 of which were located in the fieldwork region provinces of Foggia, Benevento and Avellino (see chapter 7). At this stage, the bulk of capital was invested by three Italian companies: Riva Calzoni and West Ansaldo, who had long industrial histories, and the Italian Vento Power Corporation (IPVC). Although this jointly-owned Italian-US company was a newcomer, it would go on to become a most important player of the Italian wind energy value extraction chain (Dalpane, 2015; interview with Investor-3, Winter 2018).

CIP 6/92 triggered a rush to investing in renewables and wind energy (see figure 6.1). However, the financial pressure that the subsidy system generated on the public budget led to a political backlash, forcing the government to restrict access only to plants fully permitted by 30 March 2000. In 1999, a legislative decree (d.lgs[45]) by parliament terminated CIP 6/92 and replaced it with a system based on Tradable Green Certificates (see table 6.1). The new system obliged fossil energy utilities and energy importers to convert at least 2 percent of their supply to renewable energy or buy an equivalent quota of TGCs. Certified renewable energy utilities, on the other hand, gained a TGC each MW of renewable energy they supplied to the national grid.

The renewable energy mandatory quota was increased yearly by 0.35 percent from 2004 and by 0.75 percent since 2007. The declared aim was to make TGCs demand match with supply. Yet, national and international capitals interpreted the measure as the government's orientation to intensify the financial support to renewables and kept investing in new capacity giving rise to an installation boom, so exacerbating market unbalances. These widened even further because of the subsidy period extension up to 12 years in 2006 and then to 15 years in 2007. With the sword of Damocles of the binding national targets set by the 2001/77/CE[46], in 2008 the government decided to start buying excess TGCs and a year later waved fossil energy utilities' obligation to meet the minimum renewable energy quota, transforming the system in a *de facto* FIT (Dalpane, 2015). In the wake of the 2008 financial crisis and under the pressure of a growing criticism around TGCs' aggregate costs, in 2012 the system was replaced with a Feed in Premium scheme combined with a tender or quota, depending on the power class[47], which is still in force.

Besides the subsidisation policies, another regulation created favourable conditions for an investment boom around renewable energy generation to start. This was a reform of the permitting procedure for large-scale plants with a power class equal to or larger than 1MV introduced by the d.lgs 387/2003. It substantially simplified the process for investors to secure land to develop generation plants. Through an extensive interpretation of the

[45] The legislative decree (d.lgs) is a law-making procedure, whereby the parliament instructs the government to regulate a specific matter, within the broad framework the former provides.
[46] The target for Italy was to make the share of renewable energy over gross consumption grow from 16 percent (1997) to 25 percent (2010).
[47] In 2018 the principle of technology neutrality was introduced, whereby a cap was set for both photovoltaic and wind energy.

2001/77/EC directive, the then government conferred to renewable plants the status of *public interest, urgent and non-delayable works*. As a consequence, investors are entitled to invoke *compulsory purchase orders* and compel landowners to sell land, significantly transforming power balances between landowners and investors as we will discuss in chapter 7[48].

In this section, we have examined how the energy sector liberalisation laid the conditions for a wind energy value extraction chain to emerge.

6.3.2.1 Financing renewable energy subsidy: who bears the burden in the Italian system

Italy's subsidies for renewable energy transition are funded through a levy on electricity consumption, known as ASOS. That is weighed basing on the consumer profile, with large consumers being granted progressive reductions. It follows that the larger the energy consumption, the larger greenhouse emissions, the smaller the financial burden shared, and hence the contribution to the renewable energy transition.

Table 6.2 Renewable energy levy and burden sharing amongst types of consumers in Italy

	Annual average consumption	Annual average CO2-eq emissions	Net income	ASOS surcharge	ASOS/income	ASOS/Ton CO2eq
Low-income family	3,000.00 KWh	1.06 Ton CO2-eq	€ 20,000.00	€ 323.73	1.22%	306.56 €/Ton CO2-eq
SME1	15,000.00 KWh	5.28 Ton CO2-eq	€ 120,000.00	€ 1,382.90	1.15%	261.91 €/Ton CO2-eq
SME2	30,000.00 KWh	10.56 Ton CO2-eq	€ 35,000.00	€ 1,634.55	5.45%	154.79 €/Ton CO2-eq
High-polluting Ent.	8,300,000.00 KWh	2,046,000.00 Ton CO2-eq	€ 125,488,000.00	€ 1,254,880.00	1.00%	0.61 €/Ton CO2-eq

[48] The permitting procedure presupposes a multi-level governance system, wherein several juridical sources combine with an elaborate authority architecture, which poses, to both investors and institutions, interpretive and operative difficulties. For a plant to be built a *Single Permit* (SP) must be granted. This is defined as "single" because it results from the cooperation of many administrations in a collective body known as *Conference of Services* (CoS). Each of them is required to issue one or more opinions regarding either a specific geographical area or an operative sector they are responsible for. All the opinions will then merge into the SP, including an *environmental impact assessment* (EIA), when it is required. Municipalities have a decisive role by virtue of their (i) proximity to local communities; (ii) their competence over building permits and (iii) the fact that they might own the land plots targeted for plant development. The SP procedure is normed by ordinary legislation regulating matters as diverse as energy, urban or landscape planning, the competence on which can be either regional, territorial, or municipal. On top of that, the frequent changes, determined by either legislative innovations or court judgements, contributes to a marked *regulatory uncertainty*, as we will see in chapter 7.
Differently, plants with a power class smaller than 1MW, dubbed as *mini* in the fieldwork region, are regulated by a laxer legislation involving less authorities and requiring less checks in both the permitting and operating phase. Furthermore, mini plants can also access subsidies through easier procedures. These two elements aroused investors' appetites and triggered in 2010 a new wave of speculation at it is explained in chapter 7.

A simulation, ranking different end-user types basing on their annual average greenhouse emissions, shows clearly that the amount paid each ton of CO2 released in the atmosphere decreases with the increasing of CO2 emitted and the revenue earned.

Basing on figures shown in table 6.2, it is easy to calculate that a low-income household contribute is, proportionately, 98 times more than a refinery, against an annual CO^2-eq that is half a millionth that of the refinery.

6.4 Ecological modernisation in Germany and biogas generation: a convergence of interests

This section studies the historical processes that have underlain the evolution of biogas generation from a technology embedded within the agricultural sector to a horizon of 'green' accumulation. The first subsection retraces biogas technology origin and its later functional relation to agriculture productive cycles. The second subsection explores the evolution of environmentalist debates especially in the German Federal Republic (from now BDR), and then in the reunified Germany, reflecting a dialectic between contestations to nuclear energy and interest convergence around renewable energies and biogas, within the framework of ecological modernisation. The third subsection illustrates Germany's renewable transition examining how regulations around biogas and their impact on investment peaks and devaluations. The concluding subsection investigates the ecological modernisation rationality underlying Germany's renewable energy transition, explaining its framing within two domestic variants of the liberalist thought, such as ordoliberalism and the social market economy.

6.4.1 Biogas and agriculture: a long-lasting functional relation

The development of biogas technology in Germany dates back to the end of the 19th century and the beginning of the 20th. Biogas fermenters were used to treat urban wastewater and reduce pollution. The gas, regarded initially as a by-product, started to be distributed as a fuel since the 1910s. Yet, the first anaerobic digester capable of processing manure and agricultural residues into biogas would be built a few decades later in 1944. Yet, in the post war period, the widespread use of cheap oil and coal in the reconstruction and recovery economy sensibly checked the diffusion of biogas technology. Between the 1950s and

1960s no more than 70 biogas plants were in operation throughout the former Germany's territory now divided into the BDR and the Democratic German Republic (from now the DDR; see Bruns et al., 2011; Pfeiffer and Thrän, 2018).

After the 1970s oil shocks, in a context of revived interest for alternative energy sources, anaerobic digestion of either agricultural and non-agricultural residues started to draw attention again both in the BDR and DDR, although it remained marginal comparing to solar and wind energy. In agriculture the technology was applied mainly to manage the storage and disposal of vegetable wastes and manure, with biogas and fertilisers being considered but as secondary products (Bruns et al., 2011).

By the beginning of the 1980s, technological research in the DDR had increased anaerobic digestion productivity to such a level that it became a potentially efficient solution to produce biogas and fertilisers *per se*. As a consequence, a demonstration programme was launched and eight large-scale digesters were built (Pfeiffer and Thrän, 2018). Parallelly, since mid-1980s, in the BDR at a much smaller scale experiments were run by pioneering farmers, developing rudimentary biogas plants, especially in the southern states of Bayern and Baden-Württemberg (Pfeiffer and Thrän, 2018). At the institutional level, in an effort to find an outlet for the large food-commodity surpluses, provoked by heavy subsidisation under the EEC's Common Agricultural Policy (CAP) since the 1970s, the BDR's Ministry of Agriculture established the first renewable resource department in 1985/1986, in order to enhance the production of industrial non-food crops. However, it was only in 1993 that a CAP reform, making it compulsory to set land aside from intensive food production, made farming crops to produce energy an increasingly important option for both German regulators and farmers. In fact, on set-aside lands farmers could produce energy crops and still qualify for CAP subsidies, which they would lose if they kept farming food crops. Predictably, the measure incentivised strongly the cultivation of energy crops (Thrän et al., 2020; Bruns et al., 2011). In the same year, the reunified Germany's Ministry of Food, Agriculture and Forestry established the Agency for Renewable Resources and, on the other hand, took over a programme for the market launch of 'renewable biomaterials' from agriculture, consolidating definitively the link between institutional support for bioenergy and private investments.

6.4.2 Alternative energies alternative worlds: environmentalism and anti-nuclear movements

Not only were energy crops and biogas generation studied and experimented by farmers and institutions specialised in agriculture. Insofar as they are renewable energy sources, they were also subjects of early environmentalist debates since the late 1960s, especially amongst groups with a strong emphasis on self-organisation, direct democracy and cultural production that Brown and Lorena (2011) place within the so-called *alternative movements*. Later, with the emergence of the antinuclear movement opposing the BDR government's nuclear policy, the nexus between renewable sources and radical societal change widened to include larger and more diverse social assemblages.

A clear example for that is the coalition of farmers, students and citizens, which in the early 1970s formed the antinuclear movement's first nucleus in Wyhl, a municipality in the district of Emmendingen in Baden-Württemberg, where the government sought to build a nuclear reactor. Farmers and vintners' fear that the project could damage agricultural production intertwined with alternative visions combining pacifism and claims for a democratised and renewable energy regime (Rucht and Roose, 1999; Brand, 2014; Milder, 2013). The complexity of the social composition, including the unique role plaid by farmers, emerges clearly from an interview with Hans, an officer of the national industry biogas association Fachverband Biogas e.V:

> "Hans: I think that the presence of farmers was the real special aspect of all that. They had an important role and put a lot of energy in that undoubtedly because many of them were farming that land. And they wanted to defend it! I think the special element was this cooperation between farmers, and people from the city and the university. These brought in a more general view, holding that resisting the reactor in Wyhl meant also resisting nuclear energy everywhere, at least in all Germany. So, the movement expanded.
>
> Samadhi: and how do renewables fit in all that?
>
> Hans: It was in this very special social mix that the interest for alternative energies, or should I say renewables, arose...
>
> Samadhi: And biogas?

> *Hans:* And biogas was even more special, because it was functionally connected to agriculture. It was something coming from the farmers, especially farmers experimenting organic techniques. They started to build their own fermentation systems in a very simple fashion. They just covered their manure and with a pipe extracted biogas. They also started to form networks so to share experiences which would later on become part of the biogas and biomass industry association. The Bundshuh-Biogasgruppe is an example of all that[49]" (Hans - Investor/DE-2, Spring 2018)

Hans's words shed light on the function that the antinuclear movement played as a consolidating network for the cross-society consensus around the necessity to transform Germany's energy regime. Crucial to this is the concept of *energiewende,* which in English translates into *energy transition*. Today, *energiewende* is widely recognised internationally as indicating Germany's renewable policies and their full framing within an ecological modernisation rationality. Yet, the story of this concept can be juxtaposed to the evolution of environmental discourse from its initial departure from radicality to the institutionalisation as a policy area. The term was first used in "Energie-Wende – Wachstum und Wohlstand ohne Erdöl und Uran" (Krause et al., 1980), translated in "Energie-Wende: Growth and Prosperity Without Oil and Uranium". The report was authored by three activists of the Institute for Applied Ecology (Öko-Institut), an organisation blossomed from the anti-nuclear movement, which specialised in forecasting alternative energy scenarios (Jacobs, 2012; Christoph H., 2014). The report, one of the most influential of that period, signals a drifting away from the early environmental movement's radical stances and can be considered an early manifestation of ecological modernisation in Germany. It technicalises ecological issues by contextualising the solutions it proposes within the paradigm of Germany's industrial capitalism, with three basic assumptions: (i) economic growth is not driven by energy demand, (ii) increasing energy efficiency can be equated to an energy source in its own right, (iii) oil and nuclear, as BDR's most important energy sources, could be replaced. The authors envisaged an energy scenario based on sun and coal. In endorsing the use of the latter, the authors sought to curry the favour of coal industry, workers and trade unions. By the same token, both coal and sun could evoke the national sensitivity of

[49] In mid-1980's, the Bundshuh-Biogasgruppe was one of the many groups linking farms and individuals experimenting biogas rudimentary technologies, networking in a number of cooperative homebuilt projects. If biogas for a while worked as a common ground and platform for dialogue, between agriculture and radical environmentalism, with the taking off of biogas industrialisation, yet, that relationship started to irremediably deteriorate and eventually broke. See Loske and Bleischewitz (1997).

BDR's political personnel. They could indeed be sourced in the Country and ease its dependency on imported energy (Krause et al., 1980; Jacobs, 2012; Hake et al., 2015).

The Chernobyl nuclear disaster in 1986 sensibly strengthened antinuclear movement's legitimation to the wider public. The very same year, on the one hand, the establishment of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety marked the formal institutionalisation of the political debate around environmental issues (Hake et al., 2015; Bruns et al., 2011).

6.4.3 Biogas and renewable energies as a strategic policy area

Renewable energies are regulated through policies occupying an interstitial area in between the environmental and the energy fields, within an ecological modernisation framework. In west Germany the process whereby energy policy started intersecting environmental policy developed through the opposition to nuclear technology eventually blossoming in the formation of a Green Party. The party was founded in 1980 and in 1983 sat for the first time in the national parliament. It incorporated different sensitiveness inhabiting the 1960s and 1970s social movements, not only seeking alternatives to pollutive productive systems but also campaigning for anti-prohibitionism, anti-militarism, gender equality and direct democracy. Opposition to nuclear energy worked as a floating signifier (Laclau and Mouffe, 2014; Brown, 2016) of all those themes and kept together a diversity of social actors, such as Christian democrat conservationists, activists from the new social movements, militants from dissolved Marxist groups and farmers experimenting organic agriculture [50]. The Green's key role between the 1980s and 1990s was to open a political space for environmental policy in the Bundestag, Germany's upper parliamentary house (Cordier, 1996; Bürklin, 1985; Mayer and Ely, 1998).

In the second half of the 1980s, the climate crises emerged as a new pivotal signifier within the political debate. In 1986 a picture of the Cologne's Cathedral drowning in the water was provocatively published by the magazine Der Spiegel (Uekötter, 2014). For the first time in Germany, the potential effects of the climate crisis were disclosed beyond activists

[50] The Green party included a considerable conservative sector, which in 1982 split away into a conservative formation, known as the Ecological Democratic Party. The origin of the German antinuclear movement saw the vital role of conservative farmers (Cordier, 1996; Bürklin, 1985; Mayer and Ely, 1998).

and researchers' circles to the wider public. In 1987, the Bundestag established the first parliamentary enquiry committee on the protection of the earth and atmosphere. The committee activities resulted in the establishment of the Federal Government's Climate Protection Program in 1990[51], which was entrusted to the Ministry of the Environment. The government placed under the latter's control both the energy and environment and the climate protection departments, performing different but convergent functions of the emerging climate policy. On the other side of the curtain in the DDR, energy policy was firmly oriented to the security of supply with a minor focus to environment. Although technologies exploiting both biotic and abiotic ecosystem flows were operating, they were mainly fulfilling functions different than producing energy (Jones, 1993; Friedrich-Ebert-Stiftung, 1988).

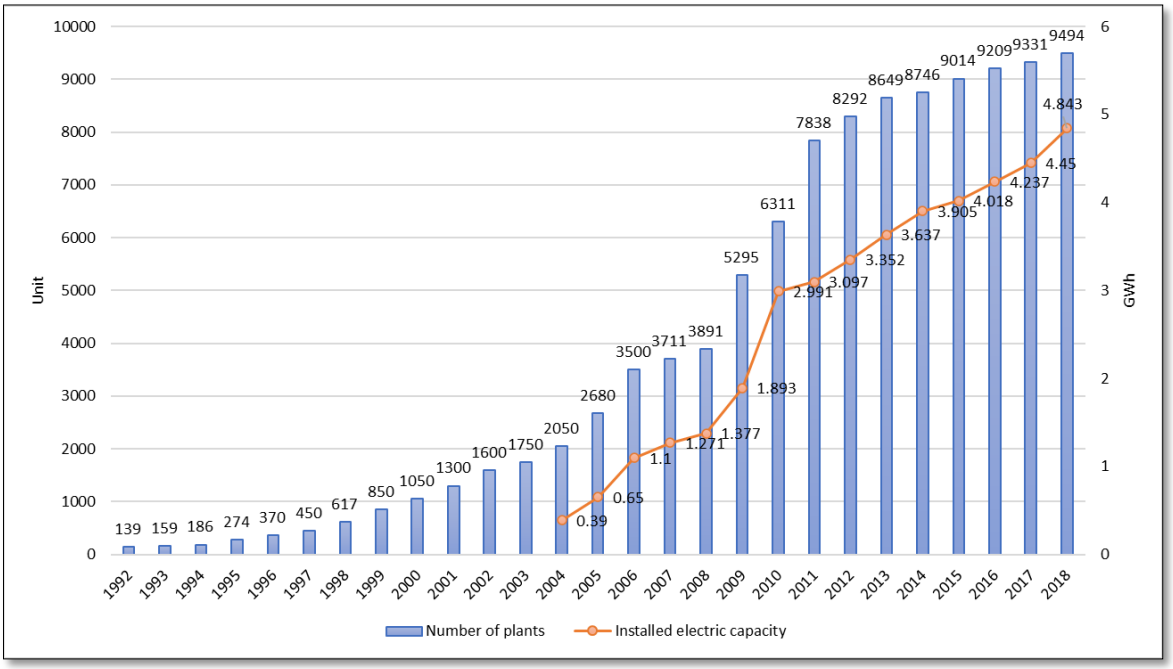
Only a decade after reunification, the formation in 1998 of the red-green government led by Chancellor Gerhard Schröder and backed by a coalition between the Social Democratic Party and Alliance '90/The Greens[52] led to a significant progress for environmental policies, based on a profound reorganisation aimed at strengthening the Ministry of Environment's administrative capacity. Furthermore, many environmental measures were introduced between 1998 and 2005, amongst which the most important were (i) the 2000 climate protection program aiming at curbing GHG emissions[53], (ii) the Future Investment Program funding research in 'green' technologies and (iii) the sustainability strategy identifying sustainability targets for all policy areas. As a branch of the environmental policy, the red-green government advanced a full-fledged renewable energy policy supporting investments in new plants and funding R&D (Rosenbaum et al., 2005). The government's key energy transition policy is the Renewable Energy Source Act (Erneuerbare-Energien-Gesetz) or EEG approved in 2000. This improved and widened the scope of action of a 1991 legislation (the StrEG) which first introduced a Feed-In-tariff subsidization scheme. EEG 2000 fixed a guaranteed tariff decoupled from energy price development and guaranteed

[51] Until 1990 climate protection was under the responsibility of the Federal Ministry of Transport (Bruns et al., 2011).
[52] Alliance 90/The Greens, or simply the Greens, is a green political party resulting from the merging of the western Green party and Allience 90, a party founded between 1989 and 1990 during the demise of the DDR.
[53] At the 1995 Berlin climate summit, Germany agreed to cut its emissions by 25 percent by 2005. The target was missed by a small margin, although the reduction was impressive so to strengthen Germany's reputation as a greening economy. Yet, the achievement was possible only because of the structural loss of industrial capacity in the DDR's former territory (Bruns et al., 2011).

a remuneration period of 20 years therefore making investment in renewable sensibly safer and profitable[54].

EEG, in conjunction with the liberalisation of energy market, opened a new accumulation space, which was soon filled by investors. It also proved to be a very successful policy and became a model for other countries. It was amended several times, the last in 2019. In 2014 the Feed-In-tariff scheme was replaced by a Feed-in-premium, complying to EU regulations (see above), and in 2017 a tendering system was introduced for most of renewable sources including biomass (Bruns et al., 2011; Hake et al., 2015; Thrän et al., 2020).

Figure 6.2 Growth of agricultural biogas generation in Germany



Source: Fachverband Biogas and Agentur für Erneuerbare Energien

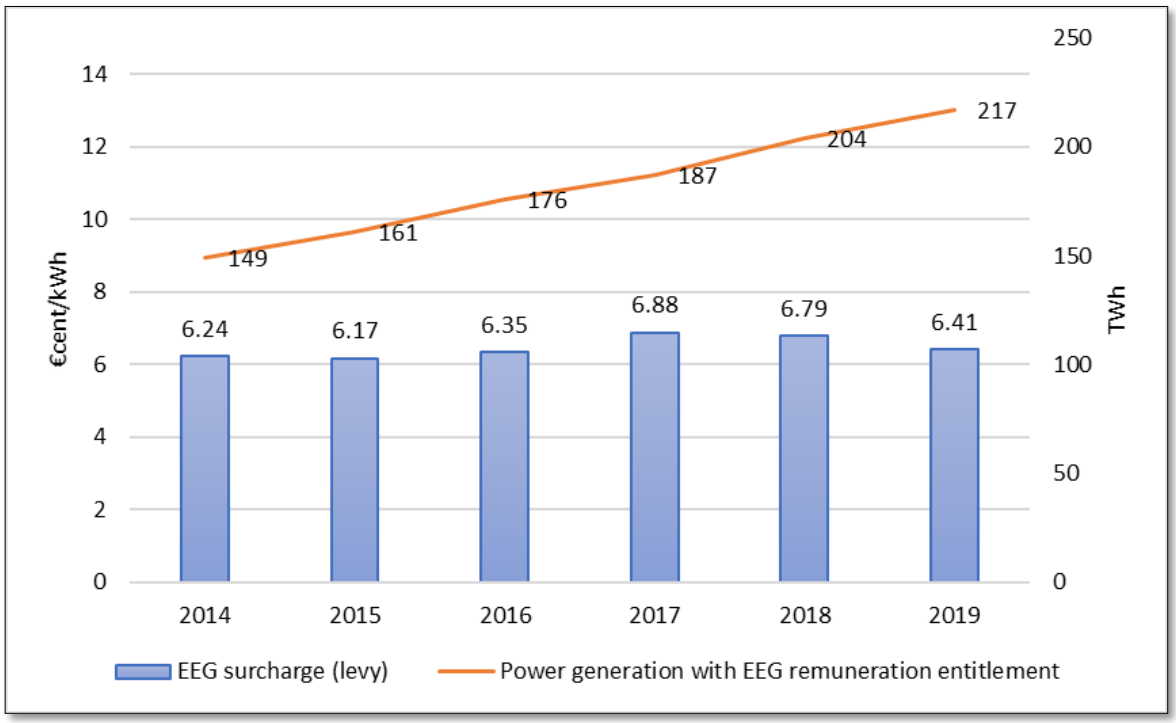
Since 2004 the EEG basic tariff has been complemented by a system of bonuses with the aim of fine tuning and steering the development of specific technologies. Particularly important for the biogas boom between 2004 and 2012 was the bonus for electricity generated from renewable raw materials[55], namely vegetable biomasses. The bonus, which was further increased by the 2009 EEG amendments, was meant to boost the use of energy

[54] The tariff was not technology neutral since it changed depending on technology and size.
[55] The bonus is known as NAWARO bonus, an acronym from it German name Bonus für Strom aus NachWachsenden Rohstoffen.

crops as biogas substrata. As figure 6.2 indicates, it translated immediately into a higher demand for energy crops and by consequence a stronger incentive towards monoculture expansion and land concentration (Hartmann et al., 2007).

In the wake of the growing criticism about the risks connected to energy crop monocultures, exacerbated by the 2008 food crisis, the bonus was repealed by the 2012 EEG amendment (Pfeiffer and Thrän, 2018). In fact, that decision substantially slowed biogas growth trend and introduced for first time an upper limit to the use cereals as substrata, setting it to 60 percent of the substrata mass from 2014, and progressively reducing it to 47 percent in 2019, and 44 percent in 2021 (Theuerl et al., 2019; Daniel-Gromke et al., 2018). Policy support to biogas was further reduced by the 2014 EEG amendment deciding that only plants approved by the beginning of that year and starting production by the end of it were entitled to receive subsidised. Moreover, a cap was introduced limiting the subsidisation of new biogas plant capacity to 100 Mw a year. This triggered a sectoral and spatial devaluation which will be discussed in chapter 8.

Figure 6.3 EEG-surcharge evolutionary trend



Source: www.netztransparenz.de

6.4.3.1 Financing renewable energy subsidy: who bears the burden in the German system

Subsidies under the EEG are funded through a levy on energy consumers, known as EEG-surcharge. Between 2014 and 2019 the surcharge ranged between 6.17 and 6.88 Cent/kWh, against a quota of subsidised renewable energy constantly increasing (see figure 6.3). With the declared aim of protecting their international competitivity large manufactures and heavy-intensive enterprises are exempted from the levy[56].

In order to better clarify distribution patterns, a comparison has been carried out amongst four different end-user types in table 6.3[57]. It appears evident that proportionally lower incomes pay more to fund the renewable energy transition. As we can see, low-income families and lower income SME bear a greater EEG-surcharge/income ratio. If the ratio between the paid EEG-surcharge and the emitted CO_2 is considered, we find that an energy-intensive and heavy carbon-emitter company can pay little more than one-hundredth the amount other consumer categories pay per ton of CO_2-eq emitted, although it releases almost 31 times more carbon in the atmosphere than all the other consumers on average.

Table 6.3 Renewable energy levy and burden sharing amongst types of consumers in Germany

	Annual average consumption	Annual average CO2-eq emissions	Net income	EEG-umlage	EEG-umlage/income	EEG-umlage/Ton CO2eq
Low-income family	3,000.00 KWh	1.46 Ton CO2-eq	€ 20,000.00	€ 206.40	1.03%	140.98 €/Ton CO2-eq
SME1	15,000.00 KWh	7.32 Ton CO2-eq	€ 120,000.00	€ 1,032.00	0.86%	140.98 €/Ton CO2-eq
SME2	30,000.00 KWh	14.64 Ton CO2-eq	€ 35,000.00	€ 2,064.00	5.90%	140.98 €/Ton CO2-eq
High-emitting Ent.	434,838,333.30 KWh	2,400,000.00 Ton CO2-eq	€ 579,000,000.00	€ 4,487,531.60	0.78%	1.87 €/Ton CO2-eq

[56] Enterprises are divided into two lists, depending on their consumption class. List 1 includes, amongst others, the energy and mineral industry as well as the plastic one, whilst in list 2 we can find meat processing companies.
Enterprises from list 1 pay one 15th of the EEG-surcharge whilst those from the list 2 one 20th. A group of extremely energy-intensive enterprises are granted a further mitigation measure: the EEG-surcharge amount the due to be paid is capped either at 0.5 percent or 4 percent of their added value.

[57] Own calculations drawing on data from the German Network Agency. The amount of the EEG-Umlage for the high-polluting company are carried out following the provisions of EEG 2017 by the Federal Ministry for Economic Affairs available at https://www.bmwi.de/Redaktion/DE/Downloads/E/eeg-umlage-2019-fakten-hintergruende.html

6.4.4 Between ordoliberalism and social market economy: Germany's way to capitalism

The rationality and administrative culture behind EEG and Germany's renewable transition rest on the principles of two variants of the liberalist thought: ordoliberalism and social market economy. The first, founded by a group of thinkers at the University of Freiburg, has been extremely influential in shaping Germany's way to capitalism. They formed the Freiburg's school which traces back to the end of the Weimar republic when the economist Walter Eucken (1891-1950) with the two lawyers Franz Böhm (1895-1977) and Hans Grossmann-Doerth (1894-1944) re-systematised liberalism around the notion of *order* (ordung). Differently from classical liberalist thinkers, ordoliberals argue that markets are social infrastructures rather than natural facts. Private property and free competition can only reach their theoretical productive potential through suitable institutional and regulatory infrastructures organised by the State (Ptak, 2009). The belief according to which the state plays a central role in enabling markets to function effectively also underlies the second of the categories in question, that is the *social market economy*. It results from a synthesis between Christian values and ethics, and liberal socialism. In it, the rigour of ordoliberalism, guaranteeing free competition and an independent monetary policy focused on price stabilisation, combines with a state's direct intervention in tackling unbalances and inequalities through social policies, so as to ensure social cohesion. This way, Germany's accumulation regime could be sustained by an austere control of inflation, alleviating Germans' fear for uncontrolled inflation (blamed - we should incidentally notice- as one of the causes of Nazism's rise) whilst being shielded from social turbulences through the pacification of class struggle. Ordoliberalism and the social market economy have interplayed in shaping Germany's post-reunification history in various ambits such as, amongst others, the use of a monetary union as a privileged way to reunification; the DDR's economy privatisation; the flexibilization of Germany's labour market and the welfare system restructuring (Stefan-Sorin, 2014). Most importantly, ordoliberalism and the social market economy have informed the renewable transition and specifically the EEG design, by legitimising a very active role of the state in regulating markets and boost as efficiently as possible surplus value extraction and accumulation in and around renewable energy generation.

6.5 Conclusions

This chapter has investigated ecological modernisation as the dominant theoretical model and policy approach upon which renewable transition policies have been built in both the EU and the national contexts of the case studies of this research. It has shown how historically contextualised regulatory and institutional systems have enabled the extraction and accumulation of surplus value in and around renewable energy, so expanding 'green' capitalism's frontier over not yet or 'inefficiently' commodified ecosystem spaces, flows and stocks.

After introduction, the chapter has discussed first the EU context, then the Italian and German ones. Specifically, it has focused on the relationships between policy making and the emergence and transformation of the environmentalist practices and discourses, evolving from contestation against, to normalisation and integration into capitalist governance structures and processes.

The chapter has prepared the presentation of the case studies in next two chapters, which investigate respectively the generation of wind energy in the Italian Apulo-Campano Apennine, and the production of biogas in east Germany.

Chapter 7 – Value extraction in and around wind energy in the Italian southern Apennine

7.1 Introduction

This chapter analyses the extraction, distribution, and accumulation of surplus value in and around wind energy production in the Italian southern Apennine, as a case of 'green' capitalism (see chapter 3). It draws on a five-month case study throughout a territory including the provinces of Benevento, Avellino, Potenza and Foggia between February and June 2018. The chapter is organised into two sections. The first investigates the case study's geographical and historical context and prepares the analysis of extractive and accumulation processes in the second.

Figure 7.1 The fieldwork region within its macroregion, the Mezzogiorno

More specifically, the first section provides a socio-historical account of the fieldwork region, with a focus on the region's marginality within the division of labour at the national and higher scales. Basing on this, it shows how the region historical geography has informed the patterns through which surplus value is extracted and accumulated through investment in wind energy.

The second section focuses on the relations of production around wind energy generation, explaining how they make the region marginality functional to a sustained level of accumulation. It applies the category of territorially based alliance to identify classes, factions and actors involved in the wind energy value extraction chain. It explains how the enclosure and grabbing of the fieldwork region cheap and marginal lands facilitated by a favourable regulatory framework has served as a spatial fix to capital accumulation overall. Finally, it discusses the transformations implied by extraction and accumulation, as they are observable at several levels, from landscapes to sociotechnical organisation and democratic life.

7.2 Between marginality and sustained accumulation: a socio-historical account of the research context

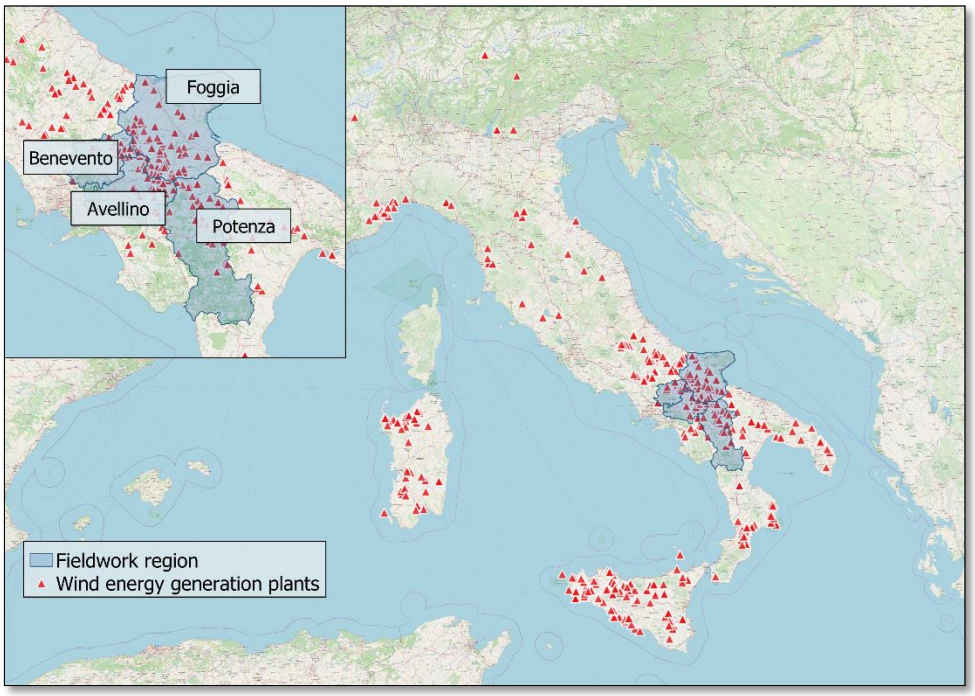
The fieldwork region accumulation patterns have long been embedded in the centre-periphery dialectic and the uneven geographical development of Italian capitalism, whereby value extraction and accumulation by territorially based alliances, at one pole, mirror unemployment, relative deprivation and migration for subaltern classes and territories, at the other. After a short introductory overview, the section presents succinctly some basic facts about the divide distancing Southern Italy, and the fieldwork region, from the country's northern and most developed regions. It will then dwell on the historical dynamics for that in the third and fourth subsections, exploring respectively the broader socio-historical context and land relations and discussing the nexus amongst marginality, accumulation patterns and state interventions. The concluding subsection analyses the catastrophic Irpinia earthquake in 1980, which destroyed a large part of the fieldwork region. The event marks a turning point for the development policies implemented by the state over the years in the region, influencing deeply its capitalist organisation. Along these lines, the subsection retraces a genealogy of accumulation patterns vis-à-vis socio-economic

marginality, throughout a historical continuity leading to investment in industrial scale wind energy.

7.2.1 Basic facts about the fieldwork region and the *Mezzogiorno*

Regardless of administrative boundaries, what stands out when travelling the fieldwork region is a general geophysical resemblance, which matches, to a large extent, a comparability of the socioeconomic fabric and cultural expressions as well as a similitude amongst local dialects.

Figure 7.2 Wind plants in Italy in 2018



Source: The wind power

Orographically, the four fieldwork provinces spread from north to south across the Apulo-Campano Apennines, a mountainous region down in the southern Italian peninsula. Administratively, they are located in three different regions, Campania, Basilicata and Puglia, part of the *Mezzogiorno d'Italia*. This term translates in English as the *midday* (or *noon*) *of Italy*. It identifies a macro-region coinciding with the territory of the pre-unitarian Kingdom of the Two Sicilies plus Sardinia. Today the term is used by the Italian National Institute of Statistics (ISTAT) to define a geographical division composed by eight administrative

regions, such as Abruzzo, Calabria, Molise, Sicilia and Sardinia in addition to the three throughout which fieldwork activities took place (see figure 7.1).

Mezzogiorno as an analytical and political category has been core to a longstanding debate on the north-south divide. Right after 1870, when the Italian peninsula and the islands were reunited in a single and independent political entity for the first time since the fall of the Western Roman Empire, the *southern question* came to the fore with its undeniable evidence. The North and the South were two "different socio-economic formations" which were "characterised by a different degree of development, which only in some northern areas could be defined as fully capitalist" (Barbagallo, 2017b p. 56). Furthermore, the enclosing of the Mezzogiorno into the new-born Italy happened through a revolutionary war against the monarchy ruling on the largest of the pre-unification States, the Bourbon Kingdom of the Two Sicilies.

Figure 7.3 Italy's per capita GDP in 2018

Source: ISTAT, date accessed: 02-07-2020

Violence did not come to an end with the unification. Riots by subaltern classes and bloody reactions by the new State would shake the Mezzogiorno for many decades up until the 1970s. Socio-economic marginality and related tensions were the core element of a debate since 1870s coalescing an intellectual and political movement known as s*outhernism*. This blossomed into many schools of thoughts, along the lines of the political philosophies prevailing over the years (idem), which, regardless of the differences, shared the tenet that "Italy will be what Mezzogiorno will be" (Mazzini in Barbagallo, 2017 p. 68).

7.2.2 Evidence of a divide

The fieldwork provinces are at the margins of a marginal macroregion. With a population density of 107.7 inhabitants per square kilometre, not only do they rank lower than the national average of 202.9, but they fall even below the Mezzogiorno average of 176.4. This fact, denoting the rurality of the region, is reflected by the importance of agriculture in the productive system. In the four provinces, the sector weighs comparatively more than in other parts of Italy. In 2016, 5.29 percent of the region's added value came from agriculture, compared to Mezzogiorno's and national average of respectively 3.62 and 2.10 percent. Still in 2016, unemployment was five points higher than the national average and more than 55 percent of jobs was concentrated in agriculture, trade, food services and public administration. All this boils down to an economy based on lower added value activities which results in substantially lower GDP performances. In 2018, the fieldwork region per capita GDP was on average almost 40 percent lower than the national, falling down to 50 percent when compared to the Italy's northern and most developed regions[58] (see figure 7.3).

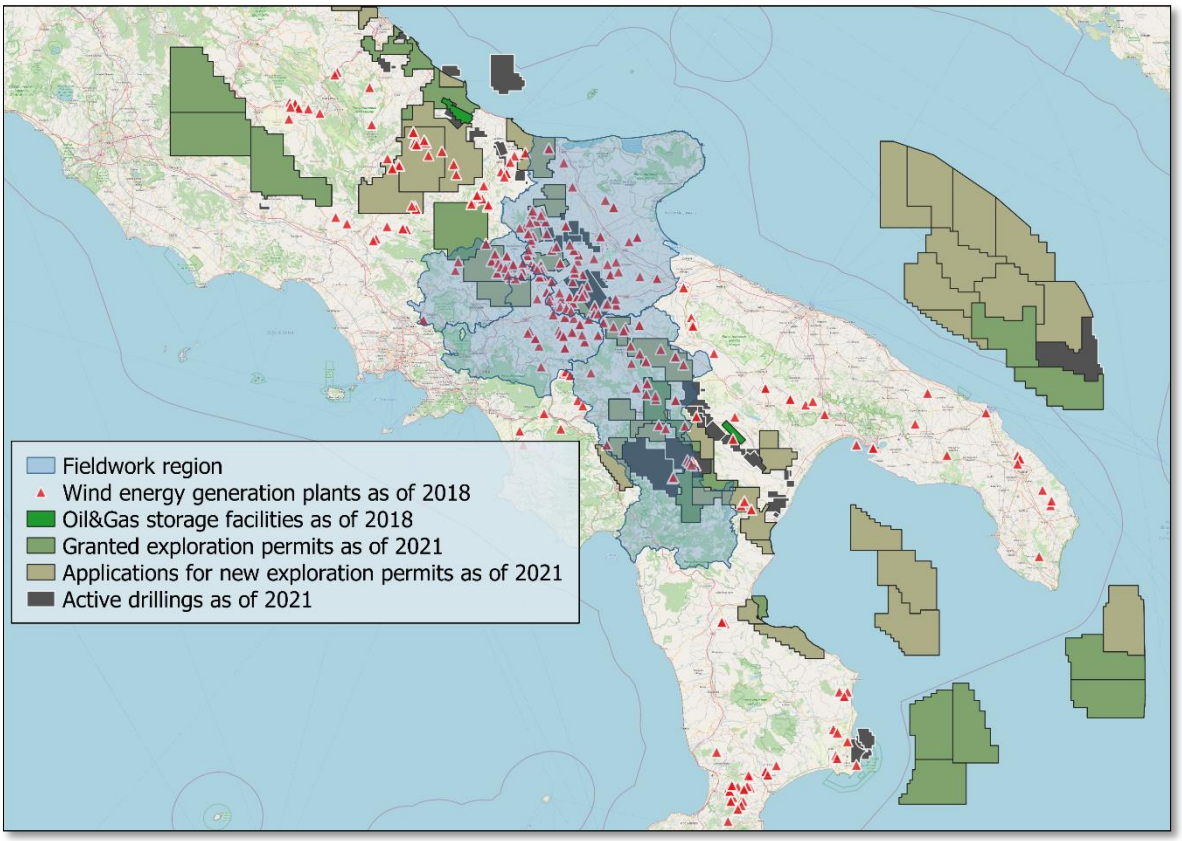
Although the fieldwork region has been an epicentre of the wind energy boom, this has scarcely translated to noticeable improvements in socio-economic indicators. One explanation is that wind energy generation is characterised by a low labour demand on average. In 2016, only 17 people were employed every MW of new capacity installed and only 0,4 people were hired permanently to operate and maintain the plants (GSE, 2017). The capital

[58] Source ISTAT. Date accessed: 02-07-2020.

intensity of the wind value extraction chain and its reliance on imported technologies compresses the job creation potential for the local and national market.

If, as we will see, a considerable portion of value is channelled back to European and extra-European capital centres where wind turbines are manufactured, further value is extracted from territory by the electricity exported in great quantities. In 2016, the four provinces produced slightly less than 13 GWh, enough to supply almost two years of their own internal demand. Of that production, 57.9 percent came from wind (TERNA, 2018). Yet, this figure does not catch the whole picture. Indeed, it leaves out an energy vector in which the region is also rich - hydrocarbons. In 2016, 27 drillings provided more than 15807 MTOE of oil and gas, corresponding to more than 40 thousand GWh[59], housing the highest number of active and permitted oil drillings in Italy (see figure 7.4).

Figure 7.4 Wind farms and oil drillings in the Italian Mezzogiorno



Source: The wind power and Italy' Economic development minister data

[59] Source: Ministry for Economic Development, date accessed: 18-05-2020.

In a landscape of marginality and economic backwardness, we can conclude that the region is a huge energy reservoir. With a very peculiar mix of 'green' and 'fossil' capitalism, it plays a strategic function in both national energy security and division of labour at the national and higher scales. As we will see below, on the one hand it imports high-added value technology needed for 'green' energy generation and oil and gas extraction and refining from national and extranational capitalist centres. On the other, a primary commodity, that is energy, is exported to national and extranational capitalist centres where it is used, amongst others, to produce higher added value commodities. These basic considerations lead us to define the fieldwork region as an *extractive enclave*.

7.2.3 Social structures and accumulation patterns: the historical geography of the north-south divide

The capitalist organisation in the Italian Mezzogiorno is defined by (i) uneven industrialisation; (ii) private investment reliance on public subsidisation; (iii) capital factions' contiguity with state articulations; and (iv) intense presence of criminal enterprises or *mafias*, which we will define from now as *armed capitals*, pursuing accumulation also through self-organised military means (Barbagallo, 2017b; Lupo, 1998). These four features shape accumulation patterns coordinating functionally Mezzogiorno's marginality with national and extranational capitalist centres. As this subsection shows, the features are rooted in the historical geography of Italian capitalism, informing also the extraction and accumulation of surplus value in and around wind energy generation in the fieldwork region.

Although feudalism had been abolished in the peninsular Mezzogiorno only at the beginning of the 19th century, the latifundium would remain the main agricultural productive system and property regime until 1950s (Lupo, 1998). The socioeconomic relations revolving around it and the severe poverty they entailed pushed millions of farmhands to migrate towards the Americas at the turn of 20th century (Barbagallo, 2017b; Lupo, 1998). The new Italian state's government took advantage of migration in multiple ways. Thanks to it, social tensions caused by poverty and deprivation could be eased. Also, the huge financial inflow generated by migrants' remittances, could be channelled to factories and companies in the North and boost the development of Italian capitalism (Bonelli, 1978).

Unemployment, migration and depopulation in the Mezzogiorno were addressed for the first time comprehensively in 1902 with special measures, implemented until 1913. Yet, Italy's intervention in World War I in 1915 widened the national divide within a generally worsening economic situation, leading to a two-year period of social unrest. Between 1919 and 1920 during *the red two years* (*biennio rosso*), labourers occupied factories in the north and farmhands occupied lands in the south. With the echoes from the 1917 Bolshevik revolution, Marxist socialism was the major ideological framework. Fearing their class privilege threatened, industrial bourgeoisie in the north and agrarian bourgeoisie and aristocracy in the south granted their support to fascism which seized the State in 1919 (Lupo, 2005). In the name of an proclaimed national unity, the 'duce', Benito Mussolini, rejected the existence of any southern question, championing rather a nationalist development agenda (Lupo, 1998; Lupo, 2005). In light of fascism's myth of rural life, Mussolini launched a 'ruralisation' of the south, which in fact failed, as evidenced by migration from southern to northern Italy and urban expansion in the south. After a 20-year fascist rule and World War II devastations, the north-south divide was as wide as never before with the average income in the Mezzogiorno 32 percent lower than in the North (Barbagallo, 2017b; Giannini et al., 2012; Castronovo, 2013). With a country to rebuild, the southern question returned to the core of the national debate. *Southernist* intellectuals gathered in the *Society for the development of the South* (from now SVIMEZ) since 1946, leading a few years later to the establishment of the *Fund for The South* (from now CASMEZ) in 1950. The Fund was a public body that would manage vast Keynesian development programmes for the Mezzogiorno in the decades to come.

The prospect of industrialising the south triggered northern industrialists' concerns about the emergence of potential competitors (Barbagallo, 2017b), matching liberalist intellectuals and politicians' belief that a combination of industrial development in the north and agricultural specialisation and migration in the south was the road to the future of Italian capitalism (Lutz, 1961). To be sure, between 1955 and 1964, while the Italian economy was booming, almost 2.5 million people left the Mezzogiorno, half of them moving to Italy's northern regions (Pugliese, 1995; Sonnino, 1995). With the crucial contribution of the low-cost labour force southern migrants provided, Italian capitalism registered a 10 percent yearly increase in profits and investments between 1959 and 1963. Once again, migration

from the South proved to be Italy's capitalism's "secret weapon" (Barbagallo, 2017b p. 146).

Mezzogiorno's state-driven industrialisation began in 1957, under the CASMEZ's direction. Initially, following Perroux development poles theories (Kongstad, 1974), CASMEZ funded small and medium enterprises, strengthening already operating industries (Barca and Trento, 1997). Later, between 1959 and 1962, public support shifted to large, mainly public, companies, investing in steel making, chemistry and oil refining, sectors useful to the export oriented industries in the north, which could so lower the cost of their inputs (Barbagallo, 2017b).

This change of CASMEZ's strategy consolidated a subalternity of industries based in southern regions to higher-added value manufacture in the North, curbing value redistribution and positive externalities throughout southern territories (Graziani and Pugliese, 1979; Castronovo, 2013; SVIMEZ, 2016). After about a decade since Mezzogiorno's industrialisation had been initiated, a study by Hytten and Marchioni's (1970) focusing on a petrochemical pole in Sicily, advanced the category of *industrialisation without development*, as a model creating *cathedrals in the desert* (Saitta, 2009). In short, the territories housing large industrial poles would only export surplus value to capitalist centre through patterns that we have defined in chapter 4 as those of an *extractive enclave.*

The 1970s decade brought deep upheavals. Salary increases related to Italian labour classes' successful struggles between 1969 and 1973 together with the oil crises in 1973 pushed average production costs up. The resulting compression of the demand for basic commodities disrupted the viability of large industries established in the south in the previous decade (Barbagallo, 2017b).

At a higher scale, in the wake of a just begun profound restructuring of the global accumulation regime towards post-Fordism, the Italian capitalism model based on a combination of public-private enterprises was now coming to an end. And CASEMEZ's fate was an eloquent sign of it. In 1971 its management system was decentralised transferring jurisdiction to administrative regions. This exacerbated political personnel's tendency to use CASMEZ as in instrument for a clientelism politics. High-ranking politicians fought over CASMEZ fund control and leveraged them to hang on to power. By allocating funds to local state

articulations controlled by lower-ranking politicians under their influence they could assemble capillary patronage networks, so to distribute privileges, build consensus and muster votes (Panebianco, 1974; Berger, 1983; Gribaudi, 1991).

The global economic slowdown at the end of the 1970s determined the definitive decline of southernism as a policy approach and a theme of the political debate. In 1984 CASMEZ was abolished.

In the 1980s, a spatial reframing of the neoclassical growth theory proposed by the New Economic Geography (Krugman, 1998) and the increasingly stronger neoliberal criticism against state interventions paved the way to a profound reconsideration of Italy's development policies. The state withdrew from productive investments in the South triggering a still-ongoing deindustrialisation and de-infrastructuring. On the other hand, the north-south divide was addressed mainly through income support measures, artificially sustaining Mezzogiorno's demand for commodities mainly produced in northern centres. Again the combination of Mezzogiorno's marginality and public funding proved functional to Italy's capitalism accumulation regime (SVIMEZ, 2016; Barbagallo, 1997; Barbagallo, 2017b).

7.2.4 Southern lands in the Italian capitalism: from a class struggle arena to a financialised investment asset

This subsection explores how class power balances around land have affected accumulation patterns in the context of the Mezzogiorno's marginality. An analysis of land is in fact vital to understanding the formation of territorial alliances around industrial scale wind energy. Furthermore, it helps us to clarify why the penetration of the wind energy value extraction chain is seen as an opportunity for redemption by some while it is the latest stage of a long-term unjust process of land grabbing and exclusion to the detriment of subaltern classes for others (interviews with Land-owner-2, Winter 2018; Acivist-3, Spring 2018).

Between 1859 and 1861, on the threshold of Italy's full unification, the countryside was home to the majority of the Mezzogiorno's population. When unification became a reality in 1870, Italy's economy rested mainly on agriculture. In the north, a modernised agriculture with a higher productivity granted farmhands better life conditions and created a financial basis for industrial capitalism. In the south, the Garibaldian revolution, which

overthrew the Bourbons, ignited hopes for a radical change in society, starting with land redistribution (Bonelli, 1978; Castronovo, 2013). Those hopes were betrayed.

Actually, nobility and church's lands were grabbed by a new rampant bourgeoisie and the land reform promised by the Garibaldian revolution never happened. Misery and extreme discontent escalated into guerrillas. Bands made up of farmhands, former Garibaldians and bourbon soldiers, mainly of peasant origin, hid in the southern Apennines. They were known as *Briganti* and their movement as *Brigantaggio*. Between 1860 and 1865, they launched countless attacks on estates and properties. Instead of wealth and land redistribution, rights and infrastructures, the new Italian state's response was a bloody repression. More than 5200 were killed and a comparable number arrested (Zitara, 1974; Ciconte, 2020; Barbagallo, 2017b).

The iron fist the state used against *brigantaggio* was the manifestation of an historical block reuniting industrial bourgeoises in the north and landed bourgeoisie and aristocracy in the south. Their interests were represented in the parliament by the Historical Right (Gramsci, 2014; Barbagallo, 2017b). Brigantaggio was eventually eradicated, but riots in the south would continue erupting throughout the decades. Between 1891 and 1894, the *fasces of the labourer's* movement (*fasci dei lavoratori*) rose in Sicily. It sprang from farmers and labourers but included also other classes. The fasces – the local groups – were established throughout Sicily and many of them referred explicitly to socialism and Marxism. The movement, whose name would be stolen by Mussolini's fascism many years later, demanded improvements in salaries, better working conditions and the right to vote. It was violently repressed (Romano, 1959). Again, between 1900 and 1915 farmhands class struggle reignited with land occupations especially in Calabria and Puglia, once more repressed by the army due to the southern agrarians influence on the parliament and government, seeking to avoid any reform of the land regime (Barbagallo, 2017b). Under fascism, southern farmhands' situation would reach its worst with landed bourgeoisie and aristocracy blocking any transformation could harm their interest. At the end of the war, land occupations started again and were in some case violently repressed either by the state or by armed bands, in the pay of the landed bourgeoisie and aristocracy. Yet, the latter's time as ruling classes was almost over. Between 1946 and 1950, with the pressures of the farmhands' struggle, latifundia were finally dissected and redistributed through a

number of reforms (Farolfi and Fornasari, 2011; Lupo, 1998). Finally, southern agriculture modernisation and transition to capitalism could begin. Nevertheless, in 1950s the living conditions in rural communities were still plagued with poverty and lack of social mobility. Such a situation affected the majority of southern populations, which resorted to migration, as we have seen above. The final demise of peasant civilisation came as a consequence. Inner areas, so the fieldwork provinces are, were increasingly hit by depopulation. With CASMEZ development programs, urbanisation and the formation of a middle class, subsistence agriculture remained a life option for a minority of the population. Fields and villages were abandoned and a massive extent of cheap land started piling up (Sonnino, 1995).

Today, the land property regime in the southern Appennino sees a mix of public and private owners. Private holdings are on average 7ha. Although post-war agrarian reforms have disassembled the previous latifundium structure with the aim of strengthening industrial and high value agriculture, extensive wheat, olive groves and grassland occupy the bulk of agricultural utilised area of the fieldwork provinces. Land property, when productive, remains therefore intimately linked to either agriculture, grazing or forestry. Family farming is the prevalent type of agriculture organisation. More specifically the most mountainous regions, such as those targeted by wind projects, are mainly devoted to grazing and forestry, while some of them are used to produce wheat (SVIMEZ, 2016).

In most cases, landowners regard land as an unproductive burden often generating solely property tax liabilities (interview with Land-owner-4 and 5, Winter 2018). All this points to a weak penetration of capitalist relations in terms of either agriculture organisation or use of land as financial asset. Most importantly, even if they increased over time, land prices are extremely low if compared with the value of investments in wind energy (SVIMEZ, 2016). As we will see in subsection 7.3.4, land relations have played a double beneficial function for the wind energy value extraction chain. They have weakened the bargaining power of landowners, whether these are of public or private nature, and thickened revenue margins by compressing land (fixed capital) costs.

7.2.5 The Irpinia earthquake

Discussing the Irpinia Earthquake in the context of this study lays bare the elements and dynamics needed to fully understand the extraction and accumulation of surplus value in and around wind energy generation. It sheds light on the relations between welfarism and clientelism tightened and blended with the so-called *economy and politics of catastrophe* (Becchi Collidà, 1988; Barbagallo et al., 1989). This category is used to describe the predation of public funds leveraging emergency narratives around disastrous events and elucidate how emergencies of exogen origin (an earthquake or the climate crisis) mutually reinforce with an endogen discursive rationality based on emergency from marginality.

At around 7.30pm on 23 November 1980, an earthquake of 6.9 magnitude on the Richter scale, corresponding to range between 7 (very strong) and 10 (extreme) on the Mercalli intensity scale, razed to the ground most of an area known as Irpinia. Its extent is comparable to that of Belgium, overlapping a large part of the fieldwork region. 90 endless seconds broke up squares, streets and houses, tore down churches, blew to pieces towers and government buildings. Entire families were wiped out; the tremor unearthed them, while sleeping, hanging out with friends at the village's pub or walking back home from work. 2914 people were killed and 687 municipalities were hit by the convulsions (Ceres, 2016; Zaccaria, 2015).

In the earthquake's aftermath, three phases can be distinguished. In phase one, defining the immediate aftermath, once the first chaotic days were over, solidarity amongst survivors and from other administrative regions took hold. Yet the Italian state emergency organisation proved insufficient and the lack of road infrastructure - a reflection of the north-south divide - caused delays in the rescue operations. Six months later, the parliament passed the law 219/1981 instituting special norms and funds for reconstruction (Ceres, 2016; Zaccaria, 2015). The spirit of national cohesion behind that act of solidarity was pictured by the then major of Rome, Luigi Petroselli:

> "Today, Rome pays back a debt to you [victims of the earthquake]: that of the millions of southerners forced to seek a job and a house [in the city]. They are amongst the best forces on which Rome can rely. Probably for the first time, Rome has been the capital of Italy, it has seen its best forces getting involved, it has revealed an honest Italy -a rigorous one. For the first time after liberation from Nazi-fascism, a new generation

> discovered the South. We will be amongst you with humility, yet without resignation, to help out." (Amendola, 2018)

Before long, those good intentions, inevitably, gave way to actual power balances within society. In the second phase, these enhanced forms of emergency underpinned the relaxing of normal legislation and the provision of special funds, creating significant accumulation opportunities. A grey conglomerate of interests emerged to seize the revenue streams available from reconstruction measures. The journalist Andrea Cinquegrani defines it as a "party of opportunist" with a structure resembling a "three-legged table":

> "one leg is the criminal organisation known as camorra (cooperating with other organisations)[60], another is the consortia for reconstruction, the last (but not least) the politicians at all levels" (Cinquegrani, quoted in Marrazzo, 2014).

Cinquegrani's words add vital details to the nature of the territorial-based alliance gathered around the earthquake reconstruction funds. Public funds were effectively split amongst three spheres of influence: so-called legal capital, armed capital (mafia – see subsection 7.3.2 and 7.3.3) and politicians. Moreover, these dominant capital factions and political powers were mostly external to the earthquake zone, coming from Naples or other administrative regions, whilst local businesses were confined to lower value extraction segments. All these characteristics occur too in industrial scale wind energy (Negri, 1996; Caporale, 2011a).

In the third phase, the accumulation opportunities became the target of territorial-based alliances, whose structure mirrored power balances within society in that specific socio-historical context. Whilst the strongest roles were played by the legal and armed capital factions, substantial mediating functions were performed by politicians and bureaucrats, overseeing public fund allocation and permitting procedures. The latter participated to the fund allocation through clientelism networks, in return for influence (electoral consensus) and a share of the surplus value extracted by the catastrophe value chain. *Territories* so became platforms through which value, generated at some other point in space and time, flowed from the fiscal system to the pocket of rent-seekers (Negri, 1996; Caporale, 2011b;

[60] *Camorra* is the name of Campania's mafia syndicate, one of the three Italy's main criminal syndicates. The others are mafia, of Sicilian origin, also known as *cosa nostra* and *'ndrangheta* from Calabria.

Gribaudi, 1991). The territorial alliance's predatory scope expanded so as to take advantage of special measures targeting industrialisation and infrastructure building, as provided by the 219/88 law. Of the 13,000 jobs promised, only slightly more than half were actually created. According to a parliamentary investigation (Italian Parliament, 1991), the main reason was a lack of proper planning, which was hampered by a parochial approach, based on political consensus and short-termist electoral cycle logic. Reconstruction funds were channelled towards specific local institutions or even companies, with local politicians and entrepreneurs redistributing value towards subaltern populations, mainly as salaries, so securing their vote.

It is worth extrapolating some analytical elements important for the next chapters. The human emergency generated by the earthquake created a powerful prerequisite for the proclamation of a Schmittian *state of exception*, whereby *an overriding public interest* justifies the suspension of the ordinary rule of law. Exceptionality, as a governmental principle, translates into special regulations and financial measures (see Agamben, 2005). Irpinia's earthquake brought in exceptional measures to simplify the normal bureaucratic procedures for public contracts and release of funds, but in the process produced a weakened control system open to predatory actors to exploit (Becchi Collidà, 1988; Barbagallo et al., 1989).

Permission to relax the normal regulations and rules for fund releasing thickened revenue margins. These were used by armed capitals participating in the value chain to expand their economic and political influence and become the major capital conglomerates they are today. Vital to this evolution was armed capital's capability to artificially create a need for security, through threat or actual use of force, so to present themselves as the solely organisation able to restore order. This way armed capital could negotiate with legitimate businesses and politicians their slice of the public fund cake. Cooperation practices amongst armed and legitimate capital factions and politicians still characterise Italy's capitalism in the 21st century and investment in wind energy (Barbagallo, 2011; Lupo, 2018).

7.3 The political economy and ecology of wind energy generation in the Italian southern Apennine

This section investigates the relations of production enabling the extraction and accumulation of surplus value in and around wind energy generation. In order to develop a comprehensive picture of value dynamics at the territorial level, the section is organised into six subsections, each focusing on a specific theme. After a short presentation of basic data about wind energy production in Italy and its spatial organisation, the second subsection applies the category of territorially based alliance (see chapter 4) to identify cooperation and conflict patterns amongst classes and state articulations along the wind energy value extraction chain. The third section analyses how class and factional cleavages inform accumulation strategies in an operative landscape characterised by regulatory uncertainty and the presence of armed capitals (mafias – see subsection 7.3.2 and 7.3.3). The abstraction of land into a financialised form of fixed capital through land grabbing and enclosure and the subsequent creation of a market for wind energy plants will be the subject of the fourth subsection. The fifth subsection investigates the revenue distribution patterns a wind plant generates amongst classes, factions and groups within the territorially based alliance controlling the value extraction chain. Finally, the sixth subsection delves into the transformative processes triggered by accumulation in and around wind energy, re-signifying the entire *territory* into an investment horizon, which as a 'green' energy reservoir, becomes part of a 'green' capitalism ecology (see chapter 4).

7.3.1 Italian wind energy: a southern affair

At the end of 2018, more than a third of the electricity consumed in Italy came from renewable sources and slightly more than 5 percent from wind (see figure 7.5). Italy's wind production is mainly based on large scale plants. In 2018 Italy ranked tenth in the world and fifth in the EU (including the UK) with 10.3GW of wind turbine installed capacity. The vast majority of this capacity (9.93GW) is located in the Mezzogiorno (see figure 7.1; see also GSE, 2017; TERNA, 2018; GWEC, 2019).

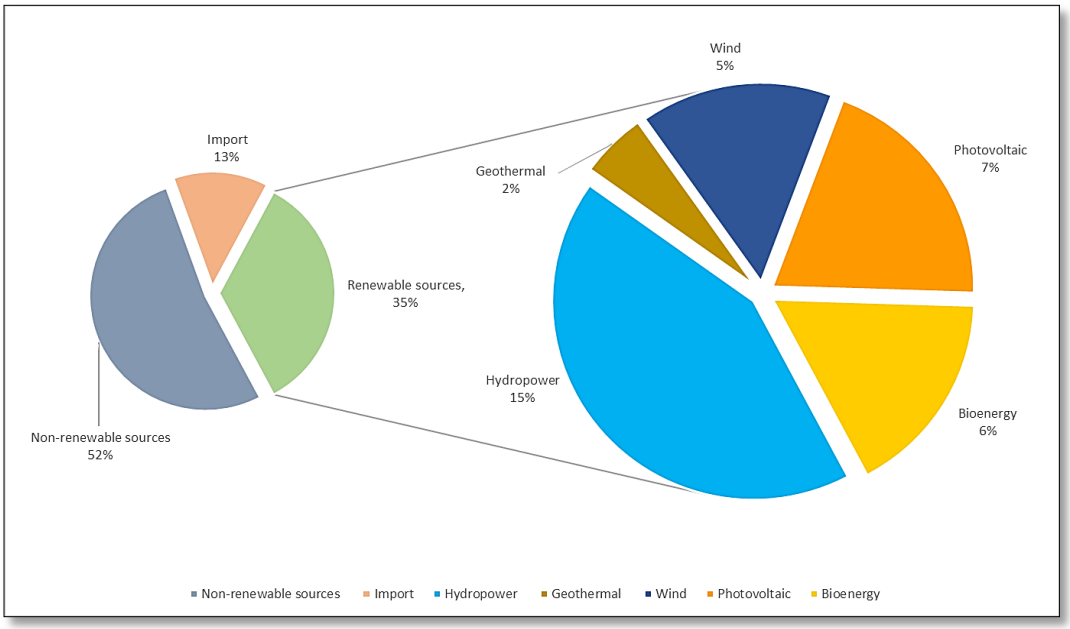
The fieldwork region is at the core of Italy's wind energy production. In 2018, more than 40 percent of the total capacity was installed there, 20 percent of which in the sole

province of Foggia. The same year, the region generated enough wind electricity to cover 2.7 percent of gross national consumption (TERNA, 2018).

7.3.2 The territorially based alliance and value extraction chain around wind energy

In chapter 4, we have seen that the opportunity to combine a spatiotemporal and a technological fix can give rise to the formation of a *territorially based alliance*. In the fieldwork region, the stimulus from renewable subsidy policies to invest in wind energy technology introduced since 1996 have been intensified by the cheap availability of land. Wind energy passing over land could now be transformed into significant revenue streams. An array of actors has coalesced around the latter, structuring a value extraction chain, with factions of the capitalist class dominating it. Alongside them, factions of the labour class, bureaucracies and state articulations have cooperated, or conflicted, through distinct spatialities and positionalities. Wind energy investments have thus reframed balance of power within local communities, according to the hegemonic legitimising rationalities.

Figure 7.5 Electricity generation and by source in 2018



Source: TERNA – Rete Elettrica Nazionale

The territorially based alliances around wind energy production in the Italian Mezzogiorno are dominated by *industrial capital* in terms of either political influence or capital

endowment with actors pertaining to two different industries. First, there are *technology manufacturers*, producing wind turbines and related technology who are to a major extent non-Italian in origin, with headquarters in Germany, Denmark, the US and China (Lacal-Arántegui, 2019; Goyal et al., 2020). The second group is composed of *energy utilities*. Of these, in 2018 ERG spa was the leading company in terms of installed capacity owned or operated. This and the following nine largest companies[61] can be classified as either utilities specialised in renewable energy production or large multinational corporations, whose energy source portfolio includes branches, often controlled through subsidiary companies, devoted to renewable energy production (Barbetti, 2016; Borsa Italiana, 2017)[62].

Capitals specialised in *tertiary* activities are the second faction in importance. These investors *provide services* throughout the entire project lifecycle. During the planning and building phase, they can carry out all or some of the activities related to engineering, procurement, construction and commissioning (from now EPCC). In the commissioning phase, the most important tertiary segment is *operation and maintenance* (from now O&M) of existing plant. The leading O&M company is the Italian Vento Power Corporation (from now IVPC). The company is a pioneer of the wind energy sector in Italy. In 1992 when the first subsidisation scheme, the CIP6/92, was launched, IPVC was one of the three players capturing the bulk of the 691 MW new capacity that was going to be subsidised (see chapter 6).

The *financier faction* is characterised by a strong presence of internationalised capital. As money lenders, financiers are particularly active in the planning and development of new projects. Up until subsidies were drastically cut in 2012 (see chapter 6), banks and other financial players would allocate money through mechanisms allowing the borrowing entity to limit its liabilities. That is the case for *project financing contracts,* whereby the new project is turned into an ad-hoc company, known as *Special Purpose Vehicle* (SPV). This is a *limited liability company*, whose liabilities, in fact, are limited to a paid-up capital quota. In

[61] Other large companies are Fri-El; EDF-EN; BKW; EDP Renovaveis; Alerion; E2i Energie Speciali; BayWa R.E.; E.ON Climate Renewables; Enel GreenPower; Ansaldo Energia S.p.a.

[62] Analysis of the Italian Wind sector has also been conducted on data from The Wind Power database accessed in October 2018

the constant strive to reduce costs and increase margins, parent companies tend to keep SPVs paid-up capital as low as possible (Barbetti, 2016).

Enrica, a local politician from a municipality in Avellino province, interprets project-financing contracts as source of risk for local communities:

> "the plant you can see up there is worth eight million euros. It was built in 2007, right in the middle of the wind sector boom period, when wind plants were springing up like mushrooms. Now, guess how much the company formally owning it [SPV] is worth? …only 30 thousand euros! Do you think it is fair or even reasonable to manage 35 wind turbines with such a small company? Who'd pay for, if a damage worth more than 30 thousand euros occurred? What if the SPV goes bankrupts becoming uncompliant with the obligation to restore the sites after decommissioning?" (Enrica - Local politician-3, Winter 2018)

This insight is key to understanding the discrepancies between the privatisation of profit and the socialization of risks and losses exacerbated by the neoliberal organisation of wind energy production. After 2012, subsidy cuts shrank new projects' margin forecasts and rendered it increasingly risky to use the project itself as a collateral for financing schemes. Therefore, lenders' preference shifted towards traditional lending schemes, requesting the loan repayment be backed by stronger guarantees. Besides debt, financiers can provide equity capital by buying shares in new projects (Campisi et al., 2018; Procopio et al., 2020). According to WindEurope (2018), on average 20 to 30 percent of total investment value consists of equity capital. Nevertheless, in 2016 only 6 percent of the total Italian installed power was owned by financial players (Barbetti, 2016).

Unlike those previously mentioned, the *developer capital faction* is mainly of national origin (Andretta, 08-02-2018). These contractors may offer EPCC services or simply execute the works according to a project prepared by a third party. Since the law institutes that up to 40 percent of the contract value can be subcontracted (Podda, 2020), a small accumulation space opens up for local businesses, specialised in small building and earth moving works and well as construction site surveillance.

As we will see later in this chapter, the fieldwork region land regime is characterised by the coexistence of purer capitalist forms, whereby land is treated as *fictitious capital*, and intermediate or non-capitalist forms, pertaining to a peasant subsistence agriculture or

public ownership. These last two forms are prevalent (see below), yet they cease to exist the moment land is sold or rented to wind energy investors, being turned into capital and yielding a composite rent to the owner (see chapter 3). Individuals and municipalities are the two main owners' categories. Although they control a fundamental condition to access wind productive power, their negotiating power is weak in the context of the region's socio-economic marginality (SVIMEZ, 2016), and changes to the legal framework since 2003, which introduced a compulsory purchase procedure (see chapter 6 and subsection 7.3.3.1 this chapter) that forces owners to sell land when requested for a renewable energy project (Interview with Land-owner-5, Winter 2018).

A further faction are *business developers* connecting upper segments of the value extraction chain with territories and fostering accumulation patterns. Although their role resembles that of service providers, the socio-cultural nuances determining their specific positionality means we need to discuss them separately. In most of the observed cases, they are professionals, with qualifications as diverse as lawyering, engineering or business consultancy, they command localised socio-cultural codes, which includes speaking local dialects, and have extensive contact networks (Scotti, 2020). In the fieldwork region they are mostly known as "middlemen" or "mediators" (Interview with Investor-2, Winter 2018). These words are also used to define functions performed by *matchmakers* (sensale) a widely diffused actor within the fieldwork region rural communities, acting as an informal mediator in a wide range of commercial fields. With the emergence of external and significant surplus value flows, conditions were laid for matchmakers to upgrade their status to business developer, despite in the common understating they remained the "middlemen" or "mediators". The specific situation occurred the first time during the years of the Fund for the South and again with the post Irpinia earthquake reconstruction measures. On the one hand, the middlemen channelled the funds throughout territories, mainly in the form of jobs or public contracts for the execution of works, towards their families and contacts. On the other, in return they asked a fee, and very often, a vote for some politician or for themselves. This clientelist political system, to which we have referred in subsection 7.2.5, is excellently described in Gabriella Gribaudi's book "Mediators. Anthropology of the Cristian democrat power in the Mezzogiorno" (1991). Over the years, middlemen have acquired knowhow and assembled influence networks, which they have been ready to use

in the event of new wave of exogenous surplus value. An occasion of this sort, arose with the wind energy boom, whereby they could sell their relational skills and technical knowledge as a service most needed by capitals in order to (i) ease relations with local authorities in charge of permitting and control and (ii) facilitate approaching landowners and appropriate land. A seminal paper by Giannini et al. (2012 p. 159) explains how middlemen

> "[enact] a practical-based expertise in very local contexts where trust is mainly established through «direct» social relations. These expert workers are well acquainted with the people, culture and social relations of the places where they work and, very often, live. Their competence accountability is strictly linked to a sort of […] embedded sociotechnical knowledge"

To put it differently, middlemen "hold the keys to the territory: without them it would be far more difficult and costlier for external capitals to invest" (Alessandro - Activist-6, Winter 2018).

Those mediating functions often interplay with the activities of a faction particularly important within the capitalist class, that is *armed capitals* (see Armiero et al., 2019). For several reasons, this terminological choice is preferred over others, more famous ones, such as organised crime or mafias. We should immediately notice that "mafia" as a word is attached to variety of meanings from novelistic narratives that obfuscate the core fact about Italy's contemporary organised crime: like any other capital faction, its mission is to accumulate surplus value. All its organisational modulations are tailored to achieve that. However, there is an important difference in that

> "the capacity of [armed capitals] members to exercise physical violence, contrasts with capitalists' general tendency to cede this capacity to the state" (Schneider and Schneider, 2011).

It follows that mafia capital's distinctive trait is the capacity to threaten or use physical violence in order to protect their interests. Although, in this respect armed capitals actually confront and undermine the state's monopoly of violence (Tilly, 1985; Varese, 2011), their underlying motivation is still surplus value accumulation. Armed capital groups which accumulate large capital quantities tend to diversify their investment portfolio and invest

part of the capital accumulated through violent practices and illegal activities in legitimate investments. Mafia capitals are consubstantial to the Italian form of capitalism. This is shown by armed capitals' estimated value which in 2012 amounted to about 65 billion euros (Galullo, 2012). This allows armed capitals to launch large scale investments, like financing or building a wind plant. Many are the judicial cases documenting armed capitals' activity as wind energy investors throughout the four fieldwork provinces. As shadow financers, they mainly provide money, which they eagerly strive to launder, but can also impose the provision of services such as security or earthmoving. This implies interactions mediated and settled in a social dimension commonly defined as a *grey zone*. It is internal to the territorially based alliance and within it legal, paralegal and illegal practices intertwine and so do a multiplicity of capital factions and actors (EUROPOL, 2013; Checchi and Polo, 2020).

Factions of the labour class take also part in the territorially based alliance, through different modalities depending on whether they are hired for temporary or permanent jobs. In the first category we find workers employed mainly in technology manufacturing as well as in the operation and maintenance of plants. Undoubtedly these workers have the privilege of a less precarious employment relationship, compared to those working in the plant development (GSE, 2017). Yet employers' positioning withing the value extraction chain and its bargaining power are also key in determining workers' level of pay and protection. If we take the case of local businesses executing fractions of development works for which they are subcontracted, we can see how they tend to employ workers for limited time spans. This may have a significant impact on workers' life quality, in the context of the widespread unemployment, endemic to the fieldwork region (Interview with Inhabitant-3, Winter 2018). In fact, the capacity to reduce the interclass conflict holding together territorially based alliances proves weaker in those segments using precarious employment contracts. This is testified to by a sort of antipathy to employers and the wind-sector as a whole by workers with less stable situations (ibidem).

The smallest portion of the extracted value is channelled to *local state articulations* through the fiscal system. Subsection 7.3.5 below will illustrate in greater detail how recent fiscal reforms have reduced the portion of value extracted through wind energy generation which goes redistributed to local institutions.

7.3.3 Investment strategies in an uncertain regulatory framework

In order to smooth the way to revenue hoarding by securing permits, eluding controls and avoiding blocks of sort, capital factions may resort to either (i) purposefully exploiting regulatory incongruities and uncertainties or (ii) consistently interchanging legal and illegal tactics according to accumulation requirements, in an operative dimension which we have called the *grey zone*. The following discussion will emphasise how these characteristics have become consubstantial to the viability of the wind energy value extraction chain also thanks to special mediating functions performed by business developers.

7.3.3.1 Regulatory uncertainty

In chapter 6, we have shown how Italy's permits framework for wind energy production rests on a multi-level governance system, whereby several juridical sources inform an elaborate authority and regulatory architecture. In fact, following a constitutional reform in 2001, the regulatory competence on energy policy, and therefore wind energy, is shared between the central state and the administrative regions. The devolution, however, was not counterbalanced by a clear and systematic national planning. In fact, the last National Energy Plan dates back to 1988 and was replaced just in 2013 by an equivalent framework known as the National Energy Strategy (from now NES), this constituting a legal vacuum spanning over twenty-year. On the other hand, the permit procedure as introduced by the 387/2003 decree (see chapter 6), missed clear guidance, lending itself to ambiguities, removed by guidelines adopted through the ministerial decree n. 219 only in 2010 (Ammannati, 2011). This configured a muddled, incoherent and often contradictory regulatory framework. Incongruities and loopholes have been leveraged as accumulation opportunities by capitals equipped with the organisational and financial means to exploit them. Such *regulatory uncertainty* still undermines the transparency and democracy of the decision-making around the expansion of wind energy new capacity and its inclusion within territory's geo-historical stratifications. As a result, the existing balance of power within society are exacerbated, to the detriment of collective interest.

In the fieldwork region, a clear example of regulatory uncertainty is offered by the Campania's legislation, where Avellino and Benevento provinces are located. Here the planning framework has proved inadequate to guarantee a geographically even development of new wind energy plants. A grassroot organisations' network, called *No Eolico Selvaggio* -

which translates into “no to wild wind energy”, where “wild” is to be interpreted as “difficult to control”, and active throughout the fieldwork region, since 2013 has denounced the absence of a Regional Plan for Energy and the Environment (from now RPEE) and the obsolescence of the Regional Territorial Plan (from now RTP). Normally, the combined provision of the two plans should zone expanding renewable capacity “in compliance with the general objectives of sustainable development and protection for either the territory’s physical integrity or its cultural identity” (Regione Campania, 2004 sec. II). In the Avellino and Benevento provinces it has been exactly the lack of planning and zoning one of the elements that has favoured territorial commodification as it is perceptible from spatial and aesthetic organisation.

While we will go deeper into this specific aspect in the subsection 7.3.6, let us note here that awareness of the deep linkages between the inadequacy of planning regulation and the extremely dense turbine concentration in some municipalities led the *No Eolico Selvaggio* movement to campaign for the *principle of unsuitable area* (from now unsuitability principle) to be inserted in Campania’s regional legislation. According to such a principle, areas should be declared as “unsuitable” for plants with power class higher than 20 kW when one of the following arises (i) the existence of hydrogeological risk, (ii) the validity of special conservation regimes; (iii) the farming of high-quality crops and (iv) the spatial saturation of the municipal territory measured in MW of installed power.

In October 2016, the movement in cooperation with several mayors managed to temporarily hegemonize the local debate around wind energy (Barbaro, 2016 and interviews with Activist-2, 5, 6, Winter 2018). As a result, the regional government enforced the unsuitability principle through the approval of the decree n. 533 (from now Dgr. 533/2016). In the same year, Lacedonia, one of the municipalities with the densest turbine concentration in the fieldwork region, blocked a new project permitting in accordance with the Dgr. 533/2016. Lacedonia municipality’s decision was appealed before the *Regional Administrative Tribunal* (from now RAT) by the applicant company[63]. In 2017 the RAT ruled in favour of the Lacedonia municipality stating that

[63] The Italian judicial system institutes a specific judicial branch intended to settle controversies, wherein at least one of the parties is a public authority. That is known as administrative justice and is organised into two instances. The lower court is RAT, whilst the higher court is the Council of State (Capano, 2003).

> "the territorio is a limited and non-reproducible resource: therefore, if in such areas a considerable number of plants has already been constructed, a ban on new installations cannot be deemed unreasonable" (Amendola, 2018)

Yet, in December 2018, on a different appeal filed by Edison SpA, a major investor of the Italian win-energy sector, for a project blocked by the Castelnuovo di Conza municipality, the RAT issued a contrary ruling, partially voiding the Dgr 533/2016. Although the court did not question the legitimacy of the unsuitability principle, it deemed "irrational" the use of installed power saturation as an assessment criterion. In fact, with the increase of turbine productivity due to technological progress -the ruling explains- it would be possible to produce the same amount of energy on smaller areas (RAT Campania, 2018). The ruling, therefore, nullified the use of installed power to define spatial saturation. Most significantly, this RAT's ruling partially reinstated the legal vacuum that *No Eolico Selvaggio* had campaigned to fill with Dgr 533/2016.

This episode also revealed the power imbalances in play between capital and grassroots movements with the huge costs implied for trying to reverse the RAT decision. To this purpose they would have two possible solutions. The first, of judicial nature, would require them to appeal the RAT's decision before the Council of State. But appealing before any of the administrative justice instances is a sensibly costlier judicial procedure (Sartori, 2017), compared to normal courts. Such costs often represent a barrier limiting small municipalities and grassroots organisations' access to justice, which are usually less financially capable than wind energy investors. The second solution would be instead of a regulatory nature. Movement organisations could campaign and lobby the regional government in order for it to fill the existing gaps, through new regulations. This option too entails financial and organisational capacities more easily affordable for large investors, as Edison SpA is (Walker, 2009; Damania, 2001). Incongruities and legal vacuums opening up opportunities for capitals to facilitate project permitting, and boost accumulation exist not only because of lack of legislation. On the contrary, they can also occur despite regulations being in place, as a consequence of a general regulatory tendency to centralise the decision making and shrink spaces for territorial communities' democratic participation.

The case in point is the SP, which is the permitting procedure for large-scale plants (see footnote 48). The SP is the result of a procedure requiring several authorities' opinions, which coordinate through a collective body known as the Conference of Services (CoSs). There are two mechanisms through which citizens and their organisation can influence CoSs' outcomes. One is to participate directly to an SP, and contingent EIAs, by submitting observation to the CoSs, to which the administrations have anyway no obligation to conform (Giardini and Marini, 2018). In this regard, we should notice that both the SP and EIA procedures were reformed in 2017 with the aim of compressing overall permitting time and lowering bureaucracy-related costs for businesses. The reform hence reduced deadlines for citizens to submit opinions and introduced an extremely strict version of *tacit acceptance*. The actual result was to make democratic participation harder and control systems weaker. Specifically on the latter, the tacit acceptance norm states that when an administration fails to issue a compulsory opinion on a pending project permitting, the project is to be considered approved. This way, while permitting becomes in fact faster and capital's interests protected, territorial communities, and the collective interest overall, are put at risks. It is self-evident that when an administration fails to issue an opinion, this also might entail failing to scrutinise whether the permitting pending project meets all legal requirements it should. For instance, contamination or safety hazards those legal requirements are meant to rule out remain a real possibility (Antonicelli, 2017).

Citizens can also influence CoSs's outcomes indirectly through their representatives. Amongst the many authorities participating in CoSs, three are elected: regional governments, provincial councils and mayors. Whilst the former two's participation is regulated in different ways depending on regional laws, mayors should always participate. Consider that mayors, and municipalities over which they preside, are the institutions with the highest level of proximity to territorial communities, whose visions, interests and development models they are supposed to protect and harmonise with policies from higher state articulations. Precisely to the point, mayors can block a wind energy project SP or impose restrictive conditions in compliance with applicable norms, provided they attend CoSs. The story told by Gianni, who is the mayor of a small mountain village in the Avellino province, is particularly illuminating. The mayor has a strong environmental awareness, as his long-term membership in a national environmental organisation testifies to. For this reason,

Gianni strongly supports wind energy while he is an advocate of territorial sustainable development:

> "We are in the middle of Irpinia, our wealth is in these mountains, forests, rivers. It couldn't be anywhere else. I'm doing now my second term as a mayor and, since I began, more than 20 small farming companies have shifted towards organic agriculture… When in 2017 I participated to a CoS for the permitting of three new wind plants, partly located in this Municipality's territory, I voted against. Mine wasn't a "no" to wind energy. I've always been an advocate of renewables. I was rather against speculation on it and what it means in terms of territorial disruption. I justified my decision by several strong reasons, which eventually blocked the permitting. Most of them refer to the Dgr 533/2016 [see above] ... The first reason I provided relates to the ban of wind energy plants on areas farmed with high value crops [as per Dgr 533/2016]. This is exactly the different development model we want for our mountains, which is also our way to sustainable development. That is oriented towards high quality productions and territory's protection, which also means protecting the integrity of the landscape. A second reason was that the new plants were to be built on conservation areas, which would be put at risk. And that is another cause for an area unsuitability according to Dgr 533/2016. That's not all. The projects were even not compliant with the minimum distances from roads and houses, as per ordinary legislation. In that conference, I was not the only mayor. There were three more, since the plants were to be built across three different municipal territories. Yet, I was the only one to vote against, my colleagues had already started with land expropriations [as per compulsory purchase law, the 387/2003 decree]. At least, however, they took part in the CoSs. It might seem ridiculous, but none of my predecessors had ever gone to a CoSs and I'm pretty sure I can tell the same about my colleagues from the neighbouring municipalities. If my colleagues had participated to CoSs many of the wind-plants exist today would not be there, simply. Many of them could not be permitted, because they missed several legal requirements" (Gianni – Interview with Local politician-5, Winter 2018)

Although wind energy, similarly to other renewable sources, is legitimised within the framework of sustainable development, its framing within extractive patterns and organisation through ecological modernisation principles can be in contrast with territorial communities' understandings about what a sustainable development really is. That emerges from the Gianni's words, which reveal how a territorial vision to invest in organic and high-quality farming as well as on ecosystem conservation can actually conflict with renewable energy production at an industrial scale. When mayors fail to take part into CoSs, and this

is a further key point from the Gianni's words, a mechanism designed to reconcile territories' visions and aspiration is compromised. Most importantly, we can observe how norms and regulations prove weaker than actual balance of power within local society, characterised by marginality and hit by a chronic economic crisis, all this translating, amongst others, into municipalities' budgetary instability.

As we can deduce from Gianni's testimony, meticulous local officers can factually slow or block accumulation patterns deemed in contrast with territorial development, provided there are supporting norms. From the investors' standpoint, excluding municipalities participation form CoSs can reduce the SP process complexity and suppress a channel through which potential dissent from local communities can be conveyed into the decision making. This pertains to an overall investors' attitude towards the regulatory framework, whose management is conceived as a pure necessity covered by dedicated investment budget items. Put differently, procedures and regulations generate costs for investors, which they bear willingly with the sole aim of removing obstacles hampering or delaying value extraction and accumulation. Investors can enact a number of operations within the boundaries of the regulatory framework to remove obstacles to accumulation. They can (i) appeal to court (see above), (ii) remunerate municipalities and (iii) landowners. We will go deeper into the second point in what follows of this subsection and take the third up in subsection 7.3.4.

Up to 2010 municipalities could place financial conditions on their approval of new projects, which in the fieldwork region are commonly defined as *royalties*. These ranged between 1.5 and 10 percent of project revenue (Campione, 2019). The significance of royalties in shaping social dialectics amongst investors, municipalities and inhabitants is plainly explained by Giuseppe, a long-time conservation activist who has gained a clear understanding of the impacts of wind energy investment on territorial transformation and the related socio-economic and juridical interdependencies:

> "Consider the endemic and enduring economic crisis causing municipalities' budgets to be constantly bordering bankruptcy. At some point, from the end of the 1990s, wind companies arrived here and offered mayors and councils fresh money in exchange for access to windy lands. That must have been seeming like a windfall…for the crumbling municipalities' budgets. I think this explains a great deal about the impetuous

> wind plant expansion down here, besides the very generous subsidisation system, of course…basically mayors took the royalties and in return gave their assent to new projects...or rather avoided to take part into CoSs, all together. And there's another important point. Royalties had a devastating impact on the local debate. They basically erased it. Those who opposed wind projects were simply cornered, muted. With all that money at hand, it was easy for mayors and councils to argue that, after all, thanks to wind turbines now a road could be fixed or a playground built. The Eldorado ended in 2010 with the decree 219. At least for municipalities…" (Giuseppe - Activist-4, Spring 2018)

From investors' perspective, royalties were a necessary cost that they consistently sought to lower. In 2010 the situation changed abruptly in their favour. The Ministerial decree number 219 provided that plant owners can agree with municipalities compensatory measures, which however, should only consist in "interventions for environmental improvement related to the mitigation of impacts attributable to the [renewable] project and for the citizenry's awareness-rising about the above themes" (Ministry of Economic Development, 2010). Essentially, permits could no longer be made conditional on the payment of royalties. The decree also strictly forbade monetary transfers and allowed only compensation measures, capping them to 3 percent of project revenues. An immediate consideration is that municipality bargaining power became much weaker and investment costs lower. Moreover, the 219/2010 decree created a situation of regulatory uncertainty promptly exploited by plant owners and managers. In effect, many stopped paying agreed royalties and some even started demanding repayment of the amounts already paid. Meanwhile, municipalities which had committed their budgets to expenses against royalties' payment, saw their financial stability in sudden jeopardy. The scale of the potential domino process encouraged national government's action, which, with the budget law number 145 for 2019, ruled in favour of municipalities and clarified that royalties agreed before the 219/2010 decree should be paid. Yet, this certainty only lasted until 2020 when a RAT expressed its doubts about the constitutionality of such norm. In order to ascertain it, the RAT referred the decision to the Italian Constitutional Court, which at the time of writing was not adjudicated on (Fiscalità dell'Energia, 2020).

7.3.3.2 The grey zone: extractive practices between legality and illegality

Value extraction from wind energy production in the fieldwork region takes place in a legal grey zone wherein capitals and other actors interplay through practices systemically

crossing the boundaries between legality and illegality. Throughout this grey zone they negotiate and trade services that structure the internal coherence of wind energy value extraction chain and allow surplus value accumulation to take place. The involved groups and actors, amongst which we can also find armed capitals (see subsection 7.3.2 and 7.3.3), enact two types of practices. First, they trade services needed to enable or boost accumulation, involving the manipulation of the legislative activity or the violation of regulation implementation and enforcement. This may happen throughout project lifecycle but especially during the planning and permitting phase. Second, they launch or finance projects investing capital from illegitimate activities, which they can so launder (EUROPOL, 2013).

To make sense of the intricate relational web connecting classes, factions and groups, we will use the categories of armed capital and corruption. Having examined the former above, we will build on Bratsis' elaboration to define the latter (2014). According to him, corruptive tactics by investors targeting either state regulatory or control functions can occur in two different spheres. At a higher level, these tactics can be enacted in the political sphere, seeking to adjust the law-making to specific vested interests. At a lower level, corruption in the bureaucratic sphere strives to manoeuvre permitting and control procedures. While we should recall that in historical-materialist terms the law and policy making reflects the prevalent balance of power amongst classes overall, the actual capability to influence legislators requires financial and organisational resources accessible only to the most powerful factions and groups of the capitalist class. Differently, practices intended to adjust permitting and control procedures may be within the reach of less powerful factions and actors, although these only allow to achieve results within the boundaries of the current juridical framework. In both cases, the transactions involved by corruptive practices create a cost for the corrupting actor and a revenue source for the corrupted actor, who acts in effect as a *seller* or *provider* of a service. In cases of political corruption, sellers are national or regional politicians or higher-level officers. Instead, in the case of bureaucratic corruption, sellers are mainly local politicians or lower-level officers.

The majority of corruption cases documented in juridical reporting around wind energy generation in the fieldwork area occurs in the bureaucratic sphere around the permitting procedures. The systematicity of corruption, with practices ranging from bribery to gift-giving, suggests the existence of a bureaucrat class, with functions either in permitting or

controlling procedures, able to trade illegitimate services and capture a share of the value extracted through wind energy production (Caneppele et al., 2013). Along this line of reasoning, basing on judicial reporting and other data, Segato et al. (2013) concluded that corruption in the renewable sector amounted to €900 billion in 2013. Such a mass of value is distributed to a significant extent amongst local politicians and officers in various ways. That is illustrated by Francesco's testimony. He is an officer who spent more than ten years working in the province of Potenza. During his career he also took part in investigations on corruption cases in the wind energy sector:

> "Selling permits has yielded many politicians and officers a fortune. They mainly sell permits which otherwise would not be granted because of missing legal requirements. They just forge the missing requirements…I mean…they just fabricate the needed documents. Otherwise, they can also sell a faster permitting procedure. Italian bureaucracy is famous for being complex and cumbersome. It can be incredibly slow…corrupt officers just slow it even more. They kind of increase the slowness so to increase the need for faster procedures, which they are ready to sell. And if you want to get thigs done, and you want so if you are investing hundreds of thousands of euros, you must pay. That is a simplification, though, just so you understand the scheme. It's not always so linear. Sometimes, officers may block a competitor, by not permitting his project, and so give way to another investors, who's a client of them. Those transactions often happen in a market where small and unknown companies trade approved projects. That is projects that are just on paper but fully permitted. So you have a thicket of planning companies, which actually are business developers, selling permitted projects to large national or multinational players. It's not uncommon that those small companies are owned by local politicians, their relatives or acolytes. And so they…say…facilitate permitting in their own interests, which, as I said, may mean blocking some competitor. It's a deep slimy system all aimed at predating incentives. There are families down here who have got very rich. They have become a big fish…" (Francesco – expert-5, Spring 2018)

From Francesco's words, several elements stand out. First, he expressly uses a buying and selling terminology. Second, he highlights the complementarity between local politicians, officers and business developers in terms of profit-making schemes. Such relational bundle is exemplified by a corruption case occurred in the Basilicata's regional authority of *Infrastructure and Mobility* in 2018. Within it an officer, employed in the office tasked with the *Protection of the Terrain*, was caught red-handed. According to a press report, the officer took

> "a €500 bribe from an «architect from Salerno» […] «for allowing him to replace an erroneous graphic composition which was already filed» in his office for the granting of the seismic clearance on a mini-wind project in San Fele. «I should have asked to the [architect] additional documents, which would have caused additional delay», as [the officer] explained to detectives. «Instead the [architect] took me a new composition and between sheets there were €500 euros. So I just got rid of the old composition replacing it with the new one» […]
>
> The [officer] started a «collaboration» with [another] engineer from Salerno. The latter, in return for a fast granting of seismic clearances on other wind energy plants between Bella and Acerenza, would give him «some jobs as a tester of wind plants […]», making him earn €500 euros each installed turbine.
>
> [The engineer] explained he «procured» [to the officer] «the role of tester for a park owned by ERG and built in 2013 in the municipality of Palazzo San Gervasio». A job for which [the two] would split €32 thousand paid by a company of the Garrone family [the ERG's owner], following pressure from «the director of the project in question». The money transited through a company […] registered to [the officer's] wife and disguised as an «administrative consulting» (Amato, 2019)

The story above typifies well the cooperative models between corrupted public officers and business developers, with the latter performing hinge-like functions (Segato et al., 2013), connecting national and international extractive segments to the locals. The relationship between the officer and the engineers, resting on a continuous exchange of benefits, with one expediting clearances to forge seismic safety evidences for wind-project projects, and the other repaying with jobs, illustrate how a corruptive mechanism works and involves directly and indirectly capital factions and actors operating at different scales and segments. In fact, the officer alludes also to a participation of ERG, the largest plant owner on the Italy's market, which however has not been proved by judges yet.

Corruption in the Italian renewable sector works "as a mechanism to connect different parties, of both public and private nature, and interests of the involved individuals and groups" (Segato et al., 2013 p. 33). In some case, corruption is instrumental to concocting fraudulent tactics, in the great majority aimed at the predation of public funds. A famous case involved Oreste Vigorito, a pioneer of wind energy investment in Italy. In 2009 he and others were put under arrest with the accusation of devising a fraud to unduly receive

subsidies for the promotion of investment in new wind energy capacity, financed jointly by the state and the EU. They would corrupt bank officers so as to fabricate solvency documents and forge certificates evidencing surface rights and property deeds on land plots. Both solvency and surface rights (or property ownership) were needed to apply for subsidies (Italian Parliament, 2012).

In their desire to carve out their surplus value share, corrupt officials and politicians may cooperate with armed capitals' groups. Judicial reporting shows that the three most powerful syndicates of Italy's organised crime, that is the Sicilian Mafia, the Campanian Camorra and the Calabrian 'Ndrangheta, are active in the Italian wind sector (EUROPOL, 2013; Segato et al., 2013). As any other capital faction, armed capitals are attracted by the accumulation opportunities offered by heavy public subsidisation on renewables. They can operate in different segments of the value extraction chain constantly readjusting their operative models and vocations. They can impose the businesses they control as either building materials suppliers or as construction companies. However, successful capital accumulation of the last decades and an increased managerial capability have prompted armed capitals' investment strategy to shift increasingly towards sophisticated money laundering schemes and legitimate reinvestment activities. EUROPOL in 2013 reported that

> "Italian [organised crime groups] today are the only EU economic competitors that suffer the opposite problem of all other entrepreneurs: too much cash money and not enough possibilities of reinvestment" (EUROPOL, 2013 p. 15)

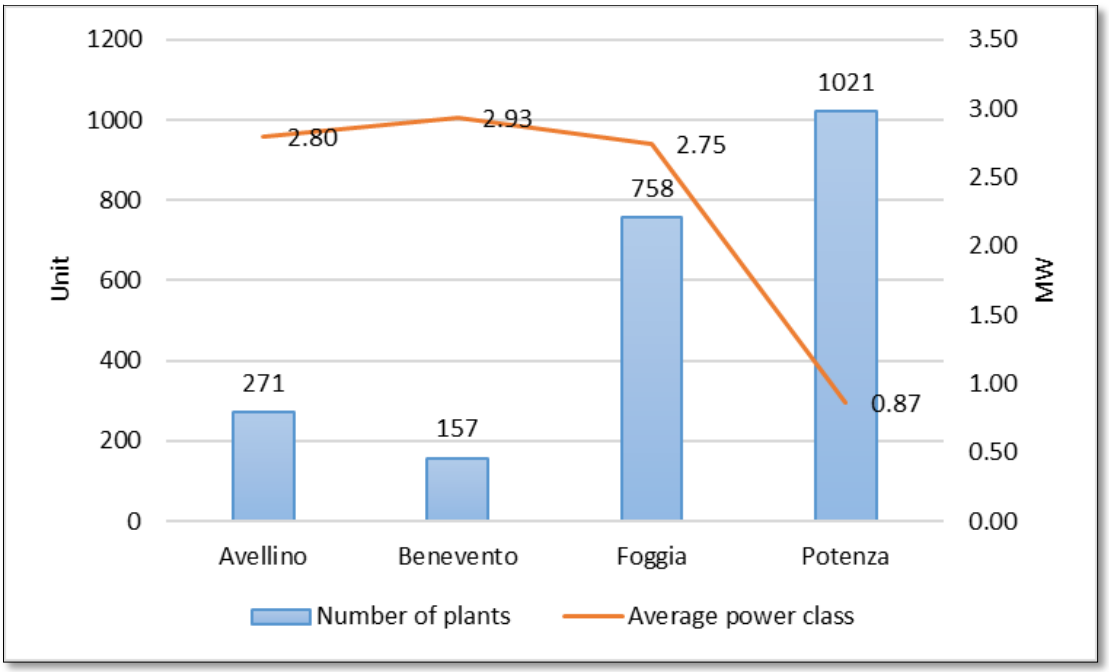
Investment in renewables is a particularly well-suited option for armed capitals (EUROPOL, 2013; Segato et al., 2013). First, thanks to the heavy subsidisation, investing in renewables can ensure a sustained profitability, second it can be combined with other business armed capitals traditionally run, such as construction works and building material supply. And third, it allows them to extend their territorial control, and therefore their hold on other economic actors, local institutions and socioecological relations (Armiero et al., 2019).

This is what the story of Vito Nicastri, another important business developer of the Italian wind energy sector, illustrates. He was arrested together with Oreste Vigorito, under the

same investigation mentioned above, and with similar accusations. Vito Nicastri was defined by Dinmore (2009) in a Financial Times' article as "The Lord of Winds". He was then one of the most successful business developers in Europe, for his outstanding capability to build wind energy plants and sell them to bigger players, also through corruptive tactics.

> "What I like about living here is that the territory is something you can feel, perceive. It's easy to get what is needed, to understand what the mayor or the councillors demand…five thousand euros it's nothing, but get you a relation..." (Giacalone, 2013)

Figure 7.6 Plants and capacity density in the fieldwork region in 2018



Source: TERNA – Rete Elettrica Nazionale and GSE

These are the words Vito Nicastri spoke while on a phone call wiretapped by anti-mafia detectives within the context of an anti-mafia investigation, who from late 2000s started targeting him, under the suspicion that he could launder mafia's capital and finance mafia's activities. When in 2009 he was arrested, he also set a record. In fact, he was seized the largest asset value in an anti-mafia investigation. Within the €1.3 billion Nicastri was confiscated, there were 43 companies, many of which specialised in wind energy production. The investigation found that those assets were connected with Matteo Messina Denaro's revenues, who is a yet-uncaught mafia super boss (Dinmore, 2010). Nicastri was arrested again in 2019, for crimes such as fraud, corruption and forgery, with the aggravating

circumstance of using mafia methods[64]. What is interesting about this more recent case is the involvement of high-profile businessmen and politicians, such as Paolo Arata, a former MP, and Armando Siri, a former vice-Minister and senator. Specifically, Arata revealed he would bribe Siri, for the manipulation of national regulations norming renewable subsidisation, which was then under reform. The modification would have increased subsidies for companies investing in mini wind energy plants. This would be Vito Nicastri's request, Arata's secret partner (Cimmarusti, 2020). Some consideration is in order here. Even if the modification in question never became part of the reformed subsidisation policy, this is a clear example of political corruption in Bratsis' terms (2014). Through it, a very specific group, that is Nicastri's business network, would protect its own interests and, by doing so, boost accumulation opportunities of all capital factions operating along the wind energy value extraction chain.

In effect, after 2012, with subsidies for large-scale plants being progressively reduced, investing in wind mini plants started to attract investors' appetites by reason of a laxer permitting legislation and easier procedures to access subsidies. Whilst national legislation set at 60 KW the threshold below which a wind-plant can be considered as mini, administrative regions were left free to set higher thresholds. Campania (Avellino and Benevento) left national regulations unchanged. Differently, Puglia (Foggia) and Basilicata (Potenza) set a higher threshold at respectively 200KW and 1MW (GSE, 2018). As a result, of the four fieldwork provinces, Potenza has come to house the highest number of wind turbines with -contrastingly- the lowest average nominal capacity per turbine, of 0.87MW against the Benevento's 2.93MW, which is the highest (see figure 7.6). Basilicata so became the "Eldorado of mini-wind energy production". These words were spoken by Cettina a young professional living in a municipality in Potenza province (Activist-1, Spring 2018). As a member of a grassroots organisation part of the "No Eolico Selvaggio" movement, she stressed that

> "Everything changed in 2010 when the regional council decided to raise the threshold up to 1MW. That was an absolute mistake. The fields in front of our house where invaded in the last few years. They call them mini-plants, but they are not small, they are still 50 metres high. But still, since they are defined mini, they are permitted with an extremely

[64] Italy's penal code institutes that using a mafia-like method or cooperating, even externally, with mafia articulations is to be considered as a judicial aggravating circumstance.

> simplified procedure overseen only by municipalities, which were not prepared to what was about to happen. After 2010 an avalanche of projects was submitted to them. They just didn't have the organisational capability to handle such a dramatic number of permit applications. Which also means they couldn't control if someone was breaking the rules. In fact, many are the cases where investors disguise large-scale plants as mini. They just submit many projects each below 1MW, so as to be permitted with the simplified procedure. But at the end you have a big plant of many MWs, because the plants are built contiguously. I don't understand why the regional council passed such a troublesome regulation, actually unleashing an unchecked invasion of wind plants. It certainly works for investors, for territories it's a disaster…" (Cettina – Activist-1, Spring 2018)

Cettina clarifies how Basilicata's simplified permitting legislation boosted a wave of impetuous accumulation around mini plant. Even more revealing is their wondering about the reason underlying the legislation. From a Marxist perspective, this lies precisely in the prevailing balance of power within society, shaped by capitalist socioecological relation and dominated by capitalist classes. In our case, these are organised in a territorially based alliance with important connecting roles played by local factions, so as to condition the legislative function along pattern intimately related to corruptive practices.

7.3.4 Land appropriation, nature commodification

Crucial to the extraction and accumulation of surplus value in and around wind energy in the fieldwork region is a nexus between weak penetration of capitalist relations into the socioeconomic regime governing access to land and regulations facilitating land acquisitions for renewable energy projects (i. e. the 387/2003 decree – see above). This subsection will show how the penetration of investment in wind energy has determined a replacement of "intermediate forms of landownership" (Harvey, 2018b p. 335) with *purer* capitalist forms, transforming land ownership into a financial asset, through processes combining land grabbing and enclosure and, subsequently, the creation of a market for wind plants, here regarded as composite fixed capital generating a composite form of rent (see chapter 3).

Let us start from evidence. In the fieldwork region property regime is fragmented with a landholding average size of 7ha. Depopulation and aging, as macrotrends arising from the region socio-economic marginality over the decades, have weakened the bonds linking

landowners to land. Often landowners do not make any use of land and in some case, they live far away from it (SVIMEZ, 2016; Barbagallo, 2017a; Povellato and Tantari, 2017), this suggesting they have a weak attachment to land or motivation to keep their landownership. Fieldwork research has shown that local opponents of wind plants, whether as individuals or members of organisations, are mainly either (i) landowning farmers or (ii) activists (often also inhabitants). Studying the motivations behind resistance, it has been observed that they can be divided into two categories. One, of materialistic nature, is to defend land as a productive asset. The other, pertaining more to the emotional and identity spheres, is to protect land as an element of the territory. It is in the last case that the sense of belonging and environmental sensitivity play an important role.

Figure 7.7 Average land selling price in 2018

Source: CREA Consiglio per la Ricerca in Agricoltura e l'Analisi dell'Economia Agraria

In the reality, such motivations appear often in combination and not always are sufficient for landowners to refuse an offer from wind energy companies. Although landowners participate in the redistribution of the value extracted through wind energy (see subsection 7.3.5) by being paid a ground rent, the share they receive and, to some extent, their attitude is not assimilable to that of any of the players dominating wind energy territorially based alliances. Landowners are definitely a weak segment of the value extraction chain,

part of an adverse market relation (Hickey and Du Toit, 2013). To support such stances, it is sufficient to consider the disproportion between the surplus value a plant generates and the price land, or surface rights, are paid for (see subsection 7.3.5).

In 2018, land sale values in the fieldwork region were on average 62 percent cheaper than in the centre or North of Italy. That is aligned with the Mezzogiorno average, as the figure 7.7 sharp chromatic difference indicates and oscillates from k€7.23 thousand a hectare in the Potenza province, to k€15.55 thousand in the Foggia province[65]. An explanation of the fieldwork region land cheapness has been anticipated in subsection 7.2.4. We will now complete it by identifying two different phases characterising land dynamics with specific focus on wind energy. Phase one spans from 1996, when the first subsidisation scheme, known as the CIP6 (see chapter 6) came in, up to 2003, when the 387/2003 decree was introduced. This opened phase two, as characterised by permanently restructured land relations (see subsection 7.3.4).

In phase one, land sale prices for wind projects were influenced by two broad factors. The first pertains to the socio-economic context and the Mezzogiorno's land market marginality to the division of labour at the national and higher levels (SVIMEZ, 2016; Barbagallo, 2017a; Povellato and Tantari, 2017). The other relates to an information asymmetry between investors and landowners, particularly acute in the initial expansion of investment in wind energy. During those years, wind energy was something new for the fieldwork region rural communities and landowners. Not only was the technology scarcely known, but obscure was also the economy of wind energy production as such, and -most relevantly- the enormous gap between the revenues realised by companies owning the plants that rural communities were seeing peeping up like mushrooms on ridges, and the amounts paid to buy or rent the needed land. Giuseppe[66] recalls that up until 2002 (Activist-4, Spring 2018), when the Italian lira was replaced by Euro, wind energy investors could buy in the Foggia province a hectare of forest or grass land for about a million lire (roughly corresponding to €500). Alternatively, they could rent surface rights for a few hundred thousand lire for each installed turbine. After 2002, land prices increased following inflation caused

[65] The figures come from an own elaboration based on date provided by CREA, a public research institution focused on agriculture and agricultural economics.
[66] For details on Giuseppe as a participant to interviews see subsection explains 7.3.3.1.

by the transition to euro, but they remained comparatively lower than the national average (SVIMEZ, 2016; Povellato and Tantari, 2017).

In the wider capitalist dynamic, we can interpret low land prices as a *spatial fix* to over-accumulated capital which finds in the wind energy sector a cheap and profitable investment. Such relation between land cheapness and wind plant profitability endured and even intensified over the second phase, starting in 2003. That year, the 387-decree entitled investors to expropriate lands targeted for an industrial scale renewable energy project, by a compulsory purchase procedure (see chapter 6). The decree further unbalanced the relation of power between landowners and investors, introducing the right for the latter to grab the former's land by legal force. According to interviews (Activist-6, Spring 2018; Expert-3, Spring 2018), this has contributed to (i) keeping land prices low, even during the wind energy market booming years between 2003 and 2012 (see chapter 6), and -most significantly- (ii) securing access to land, and wind kinetic energy, to investors, lowering overall business risks. On the other hand, landowners were left with a very limited bargaining power, which they would use differently, depending on their public or private nature. In fact, public owners, such as municipalities, could rely on a stronger bargaining power than private ones, often conditioning the issuing of building permits to the payment of "royalties", until these were declared illegal in 2010 (see subsection 7.3.3).

Now that we have explored the major elements characterising the land regime in relation with wind energy investment, we are ready to delve into social dynamics arising from investment expansion. As a premise, it is useful to keep in mind that land acquisition is a complex and contested interplaying of juridical norms, socio-cultural codes and practices organised along distinct configurations of the class and factional struggle at the territory level. Within such intricate interdependencies structured by prevalent balance of power, there are operative, and extractive, niches -as we have explained above- commanded by business developers. Amongst the latter's mediating functions, particularly vital are those involving landowners and land acquisitions.

In what follows, we will use two interviews, which are particularly significant in illustrating how socio-economic marginality, regulations and relational skills facilitate wind energy investment penetration, simultaneously leveraging and transforming land relations.

The first interview is with Alfonso, a business developer, met in one of the villages of the province of Avellino. Alfonso is specialised in dealing with local authorities to expedite permitting and negotiate land acquisitions with landowners.

> "Alfonso: the first things to secure in order to start a project are land and permits. They go hand in hand. It goes like this: when a company contacts me to start a project, we first seek a suitable area. An area is often divided into many plots, with different owners. In case of large plants, there can be more than 30 owners. Once I know who the owners are, there are two options on the table. I can go and see if landowners are willing to rent the land out. Or I can trigger a compulsory purchase procedure [as per 387/2003 decree]. This is what I do most of times. It is more effective in terms of negotiation. It makes things plain since the start. The negotiation goes like a carrot and steak game. The owners know you are entitled to take their land, and this is going to lower their expectations and the selling price. At this point I make an offer, so to avoid the compulsory purchase procedure…I go meet the landowner and basically say «look we are to take your land, but we want a peaceful settling, what about one thousand euro a year every turbine that is going to be built on your land? » Normally, the landowners resist a bit, maybe try to get a better offer, and then accept it, what else could they do?
>
> Samadhi: You mentioned that you would 'avoid the compulsory purchase procedure. Why would you, and the investing company, not want to secure land by the compulsory purchase procedure, despite triggering it?
>
> Alfonso: There are two reasons. First, that would mean the investing company should actually purchase land. But normally companies don't want that. They prefer to rent only the surface rights, so when the decommissioning time comes, in fifteen or twenty years, they won't have any legal obligation to execute site restoration works. Which, instead, is on the landowners. Second, compulsory purchase procedures are conflict-ridden. When landowners refuse an offer it's better to just raise the offer and try to convince the recalcitrant. Companies try in every way to avoid going to court. In fact, when a landowner firmly refuses to sell, even being imposed a compulsory purchase, he will probably sue the investing company. And even if the company knew it would win the case, this would come after lot of wasted time, court cases go on normally for long, and at a cost most likely higher than any peaceful settlement" (Alfonso – Investor-1, Winter 2018)

Alfonso's testimony shows first that investing companies and business developers relate to land acquisitions as something with a manageable level of risk and uncertainty. In fact,

thanks to the 387/2003 decree compulsory purchase procedure they can rest assured that they will acquire the targeted land, provided they meet relevant legal requirements. Second, it illustrates how the 387/2003 decree procedure is used by business developers and investing companies as a bargaining chip to compress land prices and curb landowners' potential resistance.

The second testimony comes from a farmer and landowner and sheds further light on the contested nature of land appropriation. It comes from a conflict that had arisen around a project developed in Circello, a village in Benevento province. The story is told by Margherita, a farmer. She and other landowners were notified of a compulsory purchase order in 2016, for the construction of a new, large, wind plant. Margherita and some of the other landowners organised a "comitato" (grassroots organisation) to oppose the decision, although they did not share a common ground on the comitato's aims. Margherita remembers that:

> "At the beginning we were about 20 farmers. We were very resolute which also means ready to bear the costs for technical and legal advisors. We formed a 'comitato', with a president, Gianluca Albini [invented name]. In the initial phase, the comitato's aims were not very clear. Some member wouldn't want to rent out the land at all, while others were just aiming at a higher renting price. And this became clear when Giuseppe Pozzelli [invented name], showed up. Pozzelli is an engineer from the bordering Avellino province, and a well-known middleman [business developer] of the wind energy sector.
>
> At that time, he was a complete stranger for us. We didn't know anything about him, coming from another province. When he arrived, he was introduced to us as someone who could help us rent the land at a higher price. I clearly remember Gianluca repeating «if we can't avoid our land being taken, at least we should get as much money as possible from them [the investing company] and try to damage them! ».
>
> And here comes the best bit. At some point, someone in the comitato recounted that a friend from Avellino province knew Pozzelli well. Apparently, this person from Avellino spoke evil of Pozzelli, describing him as a middleman normally working for wind energy companies and making a lot of money out of wind plant construction. This got us suspicious and after some investigation, it came out that Pozzelli was working for the proposer company, getting some 20 percent of the value of every land rent contract he got signed!! And that's not all...Pozzelli was in

> cahoots with Gianluca, the president, to whom he would pay 5 percent of every signed contract. At this point we connected the dots and realised Pozzelli was manipulating us to the benefit of the wind energy company" (Margherita – Land-owner-5, Spring 2018)

What becomes clear from this quote is that the middlemen's capability to conduct negotiations for land acquisitions rests on the command they have of local social networks. When they operate in territories they do not know well, they develop contacts with gatekeepers and hack the social networks that would enable them to seize control on land. Pozzelli's case is quite paradigmatic because the middleman managed to manipulate an organisation, some members of which were seeking to stop the wind energy plant development.

While the majority of the famers eventually accepted Pozzelli's offer and rented out land, Margherita and some other did not. They so decided to sue the company, on the ground that the compulsory purchase order was missing legal requirements.

> "We actually won the case; the compulsory purchase procedure was illegal. Yet, since the works were almost finished at the time we sued the company, the procedure was regularised anyway, as the legislation provides for. So the compulsory purchase order was reissued, this time with all legal requirements, and we couldn't do anything but accept the compensation. It was such a big extenuating mess…it feels like against these wind people's interests we are helpless" (Margherita – Land-owner-5, Spring 2018)

As mentioned above, similarly to other cases of landowners resisting land acquisitions, Margherita's story reveals how their strenuous motivation arises from a mix of sense of belonging, emotional attachment and materialistic considerations. When she was asked why she did not just take the money and sign the contract, she replied

> "they're coming here with all the arrogance of their huge money, treating us like ignorant laymen and take for granted we are going to rent out land. This land has belonged to my family for generations. Also, I and my family earn our living through it. We just don't want and don't need their money. We need our land" (Margherita – Land-owner-5, Spring 2018)

We can now draw some concluding remarks. Land acquisition is a contested process wherein, landowners and middlemen interplay directly in a bargain dynamic, whose outcomes are determined by prevalent balances of power within society.

Landowners are clearly the weakest part of the power relation implied by land acquisition. They are prone to accept offers which are blatantly disproportionate compared to the value extracted by wind energy investors. The introduction of the law 2003/387 further weakened landowners' position, from controlling fixed (fictitious) capital (land), and so holding a limited bargaining power, to only owning land ready for expropriation, with the only possible bargaining leverage of suing investors and making land acquisition costlier in terms of both time and money but having to bear similar costs themselves.

After unravelling how the socioeconomic marginality of the fieldwork region and the regulatory framework interplay, through the mediation of business developers, in setting the ground for land appropriation, incorporation and ultimately commodification, we are now equipped to look into value flows along the wind energy value extraction chain.

7.3.5 Value distribution patterns

This subsection focuses on value extraction and distribution patterns around wind energy. First, it investigates the revenues that a wind plant generates as profit, wages, interest, rent and taxes. Second, it analyses revenue distribution patterns amongst classes, factions and groups within the territorial-based alliance controlling the value extraction chain.

In order to simplify the analysis and sharpen the focus on actors positioning, two model projects have been postulated, which were named WP1 and WP2[67] (see table 7.1). The former is subsidised through a TGC system, while the latter through a FIP tendering system (see chapter 6). This choice allowed to investigate the two most import subsidisation phases, with WP1 covering the wind plant installation boom between 2003 and 2012 (with peak of the €/MW paid subsidy ratio) and WP2 describing the period after subsidy reduction in 2012.

Predictably, projects revenue structure changed as subsidies diminished. Calculations have shown that subsidies accounted for 62 percent of WP1's revenue, and 22 percent of WP2's revenue. Accordingly, overall investment revenue before taxes declined from € 1,622.34 per MWh generated for WP1 to € 783.10 per MWh generated for WP2, the latter being 53 percent smaller than the former. Such data resonate with descriptive statistics on win-

[67] For a detailed explanation about the methodology used see appendix B.

energy investment in Italy, illustrating a standstill between 2012 and 2015, when capitals started pumping money in again, with an increasing preference for "mini" plants (see figure 6.1 and figure 7.6).

The simulation evidences a heavy dependence of the fieldwork region wind energy plants on public subsidisation, confirming that wind energy production remains mostly financially unviable without subsidisation (Olson and Jones, 2012; Gu Choi et al., 2015; Campisi et al., 2016). While grid parity (see chapter 3) for land-based wind energy appeared a real possibility until recently, the economic recession caused by the COVID-19 pandemic has pushed grid parity out of reach again (Duffy et al., 2020). This is even more so in the fieldwork region, where anemometric data are poorer compared to other parts of the European continent[68]. That emerged clearly from interviews, especially those with people employed or investing in wind energy (Investor-2, Winter 2018; Activist 1, Spring 2018). Particularly revealing are the words spoken by Arianna, a business developer working for a large plant O&M company:

> "Wind characteristics in Italy are not that good, compared to northern Europe or the UK, for instance. Basing on that I'd say investing in wind energy is not the best choice in production terms. Yet, it is a good financial operation" (Arianna - Investor-2, Winter 2018)

Thanks to the simulation[69] we can analyse patterns through which surplus value extracted and accumulated in and around a wind project is redistributed (see table 7.1). We should pre-emptively consider that not all factions and groups related either directly or indirectly to wind energy value extraction chain, manage to capture a share of the surplus value extracted through wind energy generation. Local community members and citizens in general with no direct relations to projects are excluded from revenue redistribution, unless the portion of public spending financed through taxes paid by wind industry is considered. Politicians and bureaucrats should not receive any income from wind energy projects either, provided they are not investing in them. However, income from bribery may be considered as a form of direct income.

[68] A global database on wind data is available at https://globalwindatlas.info/
[69] For a detailed explanation about the methodology see appendix B

Differently, actors directly included into the value extraction chain are able to capture a portion of surplus value proportionally to the capital they invest and the class and factional power balances informing their room for manoeuvre [70].

Table 7.1 Simulated revenue distribution amongst members of a wind energy territorial alliance

WP1			WP2	
Plant ownership	**38.43%**		**33.18%**	**Turbine Manufacturing**
Turbine Manufacturing	**27.05%**		*7.44%*	*Tower*
Tower	*6.07%*		*16.32%*	*Nacelle*
Nacelle	*13.30%*		*9.42%*	*Rotor*
Rotor	*7.68%*		**25.97%**	**Operation and maintanance**
Operation and maintenance	**21.18%**		**24.22%**	**Plant ownership**
Plant construction	**9.24%**		**11.34%**	**Plant construction**
Development	*0.44%*		*0.54%*	*Development*
Engineering/management	*0.52%*		*0.64%*	*Engineering/management*
Foundation	*1.65%*		*2.02%*	*Foundation*
Site access and staging	*0.62%*		*0.41%*	*Site access and staging*
Land rental	*0.67%*		*1.17%*	*Land rental*
1 Land rental: landowner share	*0.56%*		*0.97%*	*1 Land rental: landowner share*
1.2 Land rental: single turbine plot - landowner share	*0.06%*		*0.05%*	*1.2 Land rental: single turbine plot - landowner share*
1.3 Land rental: middlman A share	*0.08%*		*0.15%*	*1.3 Land rental: middlman A share*
1.4 Land rental: middlman B share	*0.03%*		*0.05%*	*1.4 Land rental: middlman B share*
Aassembly and installation	*1.21%*		*1.48%*	*Aassembly and installation*
Electrical infrastructure	*4.14%*		*5.08%*	*Electrical infrastructure*
Financing	**3.90%**		**4.78%**	**Financing**
Contingency	*2.41%*		*2.96%*	*Contingency*
Construction finance	*1.49%*		*1.82%*	*Construction finance*
Property taxes	**0.20%**		**0.51%**	**Property taxes**
Council share	*0.11%*		*0.31%*	*Council share*
Gov share	*0.09%*		*0.20%*	*Gov share*

[70] Extraction and distribution patterns along the value extraction chain, as presented in table 7.1, were analysed through the Levelized Cost of Energy cost categories proposed by Stehly and Beiter (2019; also see Stehly et al., 2016). Furthermore, in order to better elaborate the information gathered through interviews and the study of relevant regulatory framework, Stehly and Beiter's classifications were integrated with additional categories to better reflect the land market around wind-energy in the fieldwork region. It has been assumed that investing companies long-term rent land surface rights, as interviews indicate. A comprehensive 'land rental' category has been included, composed of a subcategory for the landowner's share and two subcategories for business developers' shares, inasmuch as negotiating processes often involve more than one business developer, with different roles and importance and, therefore, capturing different profit share. This has been rated at respectively 15 and 5 percent of the land rental price. A further distinct category has been identified to finetune to the fragmentation of the fieldwork region land regime. That is "land rental: single turbine plot - landowner share".
Of the surplus value conveyed to state articulations, only property tax was considered, this being the most important source of income for municipalities, the institution with the highest level of proximity to territories. In fact, the amount paid through property tax is split between the central state and the municipality housing the plant, although the largest share goes to the latter. For the same reason, this is the most significant fiscal mechanism redistributing surplus value down to territories. For further details see appendix B.

Table 7.1 shows the share of profit actors were able to capture as a portion of the gross revenue generated by the projects. There stands out that plant ownership is the most profitable activity only in presence of high level of public subsidies, which is the case for WP1. The extra-revenue generated by public spending seems to flow into the pockets of plant owners, in the face of little or no change for all other actors in the value extraction chain. Put differently, heavy subsidisation does not translate into any increase of relative shares in the lower segments, but it remains captured as a composite rent by plant owners. After turbine manufacturing and plant owning, operation and maintenance is the most fruitful activity, with differences between WP1 And WP2 determined by the subsidy scheme.

In the land rental segment, middlemen and landowners' interplay. Whilst the latter are often burdened with contractual requirements, such as covering costs implied by either accidents or area restoration at project decommissioning phase, the former manage to gain significant net profit shares, also considering the low level of investment needed by the negotiating functions they perform.

Municipalities and other state articulations are the weakest actors of the chain. Of more than €300 million generated by WP1, slightly less than a million comes into council budget and little more than €600 thousand in government budget.

The simulation we have discussed above combines the multiple analytical insights developed throughout the chapter. First, we have identified groups, factions and classes part of the territorially based alliance around wind energy industry in the fieldwork region. We have then sought to understand relations between accumulation patterns and the regulatory and control system. This has led us to examine land dynamics before eventually landing here on distributional patterns. We are now ready to scrutinise dialectics of transformation of the territorialised accumulation system.

7.3.6 From a rural to an industrial district: 'green' transformations as *territory grabbing*

The territorial transformations triggered by value extraction and accumulation through wind energy generation can be intended as epiphenomena of an abstraction process

commodifying territories socioecological relations into ‘green’ capitalism’s built environment (Harvey, 2018b). This subsection explores them.

The first, most visible, layer through which transformations are experienced is landscape. The forests of turbines thronging Italy’s southern Apennines ridges have become an aesthetic element familiar to anybody visiting one of the four provinces’ villages or passing through the routes connecting them. In fact, a traveller who would drive on the motorway that runs through the Italian peninsula on the east-west direction, from the Tyrrhenian to the Ionian coast, between Naples and Bari, could not help noticing the continuity of wind plants, one after another, tens of kilometres after tens of kilometres.

Landscape, far from being simply a “subjective aesthetic representation” by atomised observers (Bonesio, 2012 p. 60), is better defined as the materialisation of a reciprocal fecundation dialectic throughout history between human and more-than-human natures that we here call a *territory* (see chapter 4 and also Magnaghi, 2013; Smith, 2008). Expanding accumulation re-signifies territories in into capitalism’s built environment, which, we should recall “appears as a palimpsest of landscapes” (Harvey, 2018b p. 233) fashioned according to the requirements of capitalist social relations.

From this perspective, wind energy plants throughout the Italian southern Apennine compose a landscape of Italy’s renewable energy transition under capitalism, that is a landscape of Italy’s ‘green’ capitalism. As such, not only are they a composite form of fixed capital (see chapter 3), but they also are the objectification of specific registers of meaning, systematised under the hegemonic rationality of ecological modernisation (Ekers and Prudham, 2018 pp. 28–29).

In the fieldwork region, ecological modernisation rationality has been observed as underlain by two distinct, yet intertwined, storylines both correlating nuanced understandings of the *emergency necessity* to modernise a supposedly dysfunctional place or field of activity through the *efficiency* of the market and private investment. The first of them conjugates the urgency to decarbonise the ecosystem with the opportunity to extract and accumulate value from it. The second analogizes the opportunity to alleviate the fieldwork region socioeconomic marginality through the positive externalities, such as employment and GDP increase at the territorial level, allegedly springing from private investment in and

around wind energy generation. Such multifarious narrative contributes to reproducing the power balance enabling territorially based alliances to control the wind energy value extraction chain, by altering the socioeconomic fabric through processes of social differentiation and others establishing sociotechnical path dependencies. Amongst the clearest examples of that there are respectively the formation of new professions such as that of business developer as well as municipalities' budgets dependence on transfers from wind energy plant owners (see above).

Landscape alterations and the reframing of social relations have also been accompanied by adjustments of a territory's democratic life. On the one hand, the analogy between socio-economic marginality alleviation and wind energy investment has been leveraged by wind energy companies and their advocates to pacify opponents and suffocate democratic debate (see above)[71]. On the other, the impetuous plant expansion has sparked conflicts all over the four provinces, which escalated into mobilisation resulting in the "No Eolico Selvaggio" grassroots movement (see subsection 7.3.3.1 and 7.3.3.2). Yet, despite knowledge and practices stratification tended to deconstructing the official knowledge legitimising wind energy territorialised accumulation patterns, the political influence of the "No Eolico Selvaggio" network has been checked by the governmental effectiveness of ecological modernisation rationalities, in the distinct forms we have discussed in subsection 7.3.3 (see also Rutherford, 2017). Moreover, they have undermined communities' capability to escalate organisational dimension into effective interregional or national networks. Giuseppe[72] that

> "Endorsing the idea that renewability and sustainability are equivalent concepts is a demagogic trick only useful to disguise, and facilitate, financial speculation on wind energy. In fact, wind energy might well be renewable but the speculation on it is definitely socially unsustainable for our territory.
>
> If renewable sources are considered sustainable by definition, whatever way they are organised, it's easy for investors to reduce our arguments

[71] For an account of similar cases documented in rural Denmark see (Rudolph and Kirkegaard, 2019). For further details see footnote 116.
[72] For details on Giuseppe as a participant to interviews see subsection explains 7.3.3.1.

> to just NIMBY anti-modernism[73], moral inferiority and even concealed pro-oil attitude, because -they argue- we just don't want plants in our village or worse we are against wind energy as such. That is roughly their storyline, repeated and amplified even by some big NGOs and politicians at any level. That storyline is actually powerful because takes environmental arguments and turns them against us. Basically, they blame our claims for being environmentally dangerous. And that's a paradox, because we actually are an environmentalist movement, only not the way they would like us to be!" (Giuseppe – Activist-4, Spring 2018)

In effect, within the "No Eolico Selvaggio" network, the understanding of environmentalism combines with a social justice perspective at the territorial level, which should be interpreted in the wider context of the so-called *territorial movements* (Pellizzoni, 2014). There, resistance to 'green' capitalism's extractive mechanisms and claims for a de-commodified wind energy generation interweave with other struggles such as those opposing oil drillings, organised in a cognate grassroots network known as the NO TRIV movement (D'ascenzio and Ferraro, 2015). Such multi-layered participation facilitates the circulation of ideas and practices that help conceive resistance to industrial scale wind energy in a more comprehensive way, and its contextualisation within a wider critique of capitalism. If on the part of investors and state articulations the renewable transition is understood as a technicality pertaining to the non-debatable strategical framework of capitalist governance, for social movements questioning that very framework and its ineluctability lays bare ecological modernisation dogmatism undermining territorial communities' democratic life by technicalising issues that are eminently political and withdrawing them from democratic control.

Nevertheless, questioning wind energy organisation at a systemic level implies a long-term horizon often incompatible with the narrow spans available for grassroots organisations seeking to block or remodulate specific projects. For this reason, alongside a wide-ranging social critique, wind energy impetuous penetration has also encouraged a shorter-term struggle perspective relying majorly on legal actions to sue investing companies for alleged irregularities, most often in the permitting procedures. This translates into a *judicialization* of socio-political conflicts around wind energy, intended as "the reliance on courts and

[73] According to the Cambridge Dictionary "NIMBY" is the "abbreviation for not in my back yard: a person who does not want something unpleasant to be built or done near where they live".

judicial means for addressing core moral predicaments, public policy questions, and political controversies" (Hirschl, 2011 p. 1). Judicialization confines political participation within the boundaries of the regulatory framework solidly resting, we have seen, on ecological modernisation and neoliberal governance principles (see chapter 2). Along these lines, compensation measures negotiated by municipalities and investors, to pre-emptively defuse potential conflicts (see above), translate territorial political subjectivation and resistance into a mere accounting issue. Territorial communities' imaginaries and democratic life are so commodified and monetised into costs, which -as such- must be lowered as much as possible.

In conclusion, the socioecological transformations implied by accumulation through wind energy generation take place around (i) landscape alterations, (ii) class and factional conflicts and cooperation, (iii) local institution organisation and (iv) territories' democratic life. In chapter 4 we have defined this pervasive process metabolising the entirety of a territory, or of places of it, into an object of capital as *territory grabbing* (for a full definition see chapter 9). It implies the *abstraction* of territories as an extensive platform for surplus value extraction, although this may come at the price of facing resistance and conflict. In the case of wind energy generation in the Italian Apulo-Campano Apennine, (and with biogas in eastern Germany, as illustrated in chapter 8) large portions of the fieldwork region are abstracted into an extensive 'green' energy reservoir. As a result, the rural character of the fieldwork provinces is meshed with their new function of 'green' energy industrial districts.

7.4 Conclusions

This chapter has discussed value extraction and accumulation patterns as they are organised around the generation of wind energy in four provinces of the Italian Apulo-Campano Apennine.

The first section after introduction has described the fieldwork region's socio-historical context, providing an interpretation of the region's marginality within the division of labour at the national and higher scales. Thanks to such an approach, it has been possible to identify surplus value extraction and accumulation patterns characterising the region's historical geography and, by extension, wind energy generation.

The following section has analysed in dept the relations of production in and around wind energy generation, illustrating how the region's marginality is leveraged to keep a sustained level of accumulation. To this purpose, it has applied several historical materialist categories and studied a multiplicity of analytical dimensions, such as: regulatory and administrative mechanisms, class and factional cooperation cleavages, enclosure dynamics and transformative trajectories.

The next chapter develops a similar analysis around the generation of agricultural biogas in two states of eastern Germany yet adapting it to the specificities of that context.

Chapter 8 – Value extraction in and around agricultural biogas in Brandenburg and Mecklenburg-Vorpommern

8.1 Introduction

This chapter discusses the extraction, distribution, and accumulation of surplus value in and around industrial scale biogas from agricultural substrata in eastern Germany[74], as a case of 'green' capitalism. Specifically, it elaborates the findings of an eight-month case study in the states of Brandenburg and Mecklenburg-Vorpommern (see figure 8.1), between May 2018 and January 2019.

The chapter is divided into two sections. The first focuses on the socio-economic context of the case study through the lens of a geographical and historical perspective. Specifically, it explores the marginality of the fieldwork region to the division of labour at the national and higher levels. It also elucidates the dynamics through which the current conditions to access agricultural land and the agricultural sector -which are structurally linked to biogas generation- have emerged, as characterised by low prices and a concentrated ownership regime.

The second section clarifies the political economy and ecology of biogas in the fieldwork region, by putting the arguments introduced in the first into motion and enriching them with new elements. More precisely, it develops a value and class analysis showing how the fieldwork region marginality and its specific land relations have been functionalised to a sustained level of accumulation in and around biogas. This is built on three distinct analytical levels. After an investigation of the territorially based alliance controlling and organising the biogas value extraction chain, the section turns its focus onto value extraction and accumulation patterns as an intersection between land relations and subsidisation policies. In conclusion, the section explores the transformations induced by the expansion of 'green' capitalist relations over not yet or 'inefficiently' commodified land and natures.

[74] East Germany is a macro region including the territory of the former DDR and divided into five federal states or Länder. For further details see footnote 7.

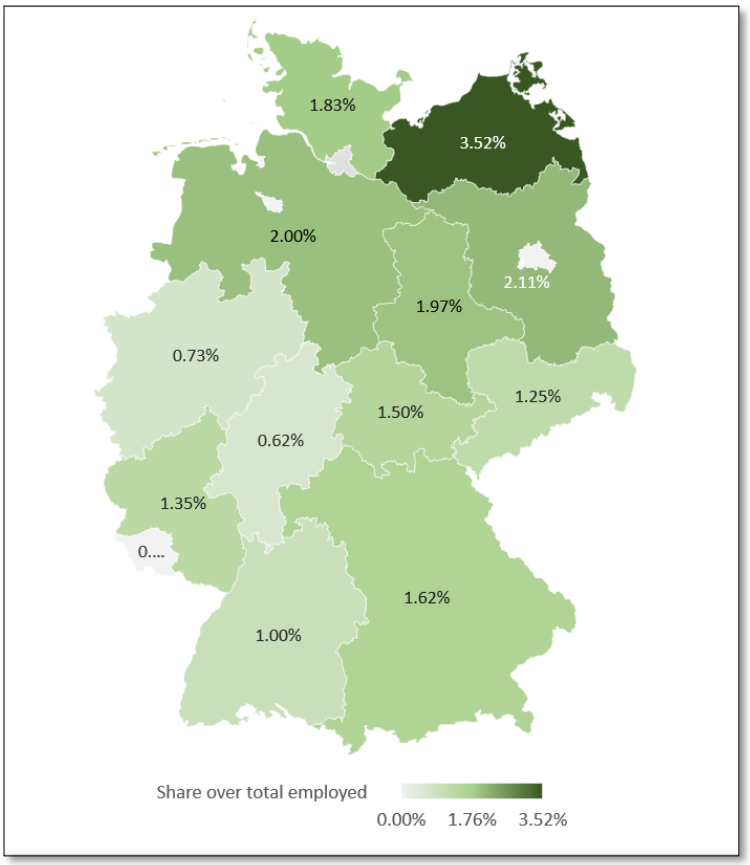
Figure 8.1 Fieldwork area within east Germany

8.2 The fieldwork region as an extractive enclave

The function played by the fieldwork region within the division of labour at the national and higher levels is fully framed within the patterns of Germany's capitalism uneven development. Sustained accumulation in low-added value sectors of the economy couples with systemic unemployment, lower incomes, and migration for subaltern classes. Such contradictory relations materialise as the historical divide separating the region, and east Germany, from the western and richest part of the country (Becker, 2015). This is characterised by centre-periphery dialectics, wherein the extraction and accumulation of surplus value in and around biogas generation is embedded. As such, the latter can be fully

comprehended only if the former are thoroughly explained. Towards this purpose, the section is organised into two subsections. The first combines quantitative and qualitative evidence clarifying why the region should be categorised as an *extractive enclave.* Along this trajectory, the second illustrates how the region's marginality is reflected in the dynamics determining the access conditions to its lands, which have stratified along the complex and in many respects troubled history of Germany as a nation state.

Figure 8.2 Employed in agriculture in 2018



Source: Eurostat, date accessed 25-08-2020

8.2.1 A marginal territory in a marginal macro-region

This research studies the value dynamics in and around biogas generation building on the debate on the production of space (Lefebvre and Nicholson-Smith, 1991) and territory (Raffestin, 2019). Specifically, it intends *territory* as a dialectical, interstitial spatiality and positionality traversed by conflicting power relations within the wider division of labour (see chapter 4). From this perspective, a territory appears as a historicised socioecological

-in-the-making- stratification, defined by frictions between expanding and enduring capitalistic accumulation and, on the other hand, pre or inefficient patterns of capitalist relations of production. Against this backdrop, the subsection explains why the fieldwork region can be considered as a *territory* whose socio-economic marginality has combined with biogas subsidisation in offering fixtures[75] to investors from west Germany and other capitalist centres.

The fieldwork region's marginality can be deduced from a number of socio-economic characteristics. First, it is sparsely populated with a density of 78.8 inhabitants per km², which, compared to national average of 234.7, is the lowest in Germany[76]. Furthermore, agriculture is structurally important in both Brandenburg and Mecklenburg-Vorpommern. As figure 8.2 shows, the two states have the largest share of people employed in the agricultural sector, coupled with a weak industrial fabric (European Commission, n.d.1) and the smallest proportion in the country of people employed in industry. The economy rests on activities with a lower added value. That is reflected in the average household disposable income which in 2018 was 7.39 percentage smaller than the national average[77].

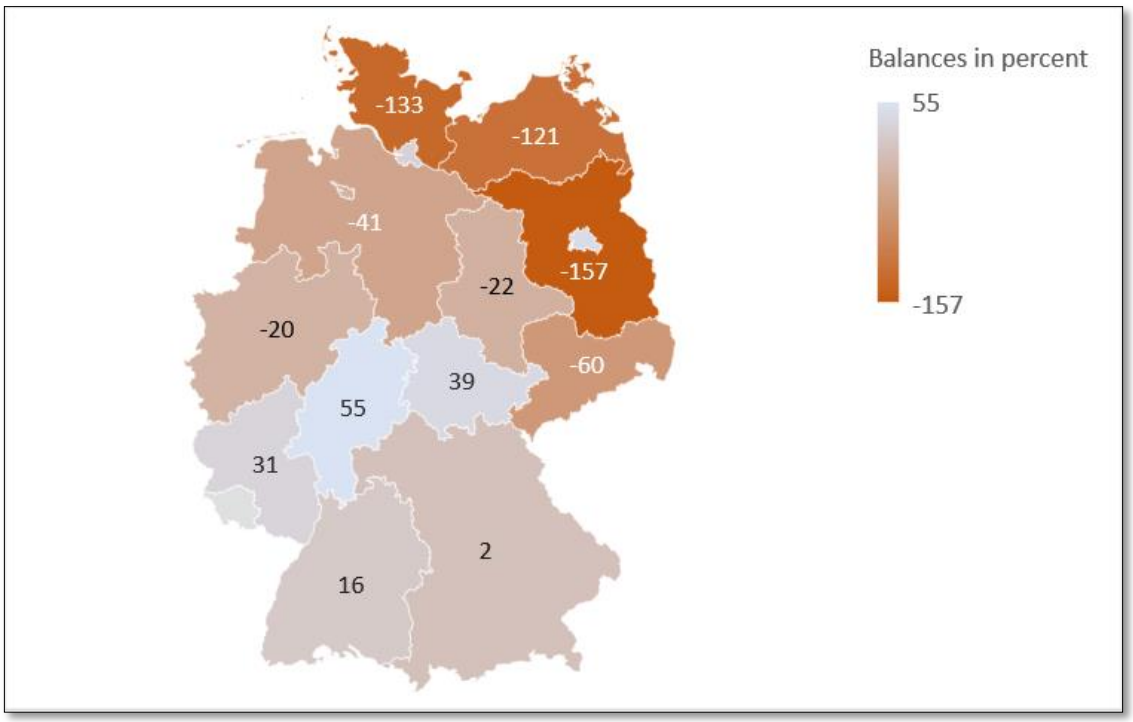
Interestingly enough, in the fieldwork region more people than in the rest of Germany work in the renewable sector. Whilst, in 2016, 20.8 workers per 1000 in Brandenburg and Mecklenburg-Vorpommern were employed in the renewable sector, the figure falls to 12.6 in east-Germany and 8.6 in Germany as a whole. A contraction of employment in the renewable sector all over Germany between 2013 and 2016 did not concern the fieldwork region, where, on the contrary, jobs in the sector slightly increased[78]. According to Ulrich and Lehr (2018) this should be related to the region productive specialisation. Particularly in bioenergy generation, subsidisation cuts after 2014 (see chapter 6) have shrunk the demand for new plants, impacting technology manufacturers and companies specialised in plant planning and construction. Hence, intensely industrialised federal states have lost more jobs than those specialised in either energy-crop production or their transformation

[75] The category of fixture is here borrowed from Harvey's work (Harvey, 2018) to indicate permanent or temporary systems, whether of material or immaterial nature, used by capitalists to increase the rate of accumulation.
[76] Source: Eurostat. Date accessed: 21-04-2020.
[77] Ibidem.
[78] Source Agentur für Erneuerbare Energien, date accessed: 24-04-2020.

into some energy vector. That is exactly the case of Brandenburg and Mecklenburg-Vorpommern.

This specialisation in the low added value segments of the bioenergy value extraction chain suggests categorising the fieldwork region as an extractive enclave (Brand et al., 2013; Mezzadra and Neilson, 2017). Once energy is extracted, through high value-added fixed capital (machineries) mostly imported from capitalist centres in western Germany or the EU, it is channelled back to the latter, where it fuels further high value-added production. Data on energy balances confirm an extractive trend around energy. In 2016, eastern Germany's states produced and exported an electricity amount equal to 64 percent of its total gross consumption. Figures are sensibly larger if we consider only the fieldwork region with an energy export averaging 139 percent of its gross consumption (see figure 8.3)[79].

Figure 8.3 Electricity exchange balances in 2016



Source: Agentur für Erneuerbare Energien

[79] The large renewable energy production and export taking place in Schleswig-Holstein is an important exception. Differently from the fieldwork region, the north-western federal state is an advanced and rich economy.

Not only socio-economic marginality is documented by data. It is also distinctly perceived by people. In 2019 a government's report on the "State of German unity" found that 57 percent of east Germans saw themselves as second class citizens (German Federal Government, 2019). The disaffection and frustration punctuated with the unfulfilled promises of national reunification is an element markedly emerging from interviews with farmers and inhabitants (interviews with Farmers-1, 4, 5, Autumn 2018; Inhabitant-1, Autumn 2018; Inhabitant-2, Spring 2018). In this respect, the words used during an interview by Ulrich, a chairman of an agricultural cooperative in eastern Brandenburg nearby the Polish border, are remarkably evocative. The coop breeds milk and meat cows and produces corn and rye, controlling in total 1500 ha, two third of which are rented from other landholders:

> "now it seems that all this area is about is agriculture and land. In truth, it wasn't always like it is today. During the DDR era, there was industry around here, manufacturing, metallurgy, chemicals. In the early 1990s all the kombinat[80] were put under the control of Treuhand [see subsection 8.2.2]. In most cases they were simply sold-off, almost for nothing, or even liquidated. The same thing happened with land, and what is happening today comes from there. Whilst capitalists did roaring trades, millions of peoples found themselves unemployed, something really new for an east German…now, thirty years have gone by since the reunification and many promises have remained the same…just promises…the economy is weaker than the rest of the country, infrastructure are less, east Germans in the top positions rare…"[81] (Ulrich – Farmer/DE-4, Autumn 2018)

Ulrich's description blatantly contrasts with the accumulation of large fortunes through industrial-scale agricultural biogas in the fieldwork region. What is the relation of a multi-billion value extraction chain and the marginality of that territory? At a first sight, we can argue that cheap land, renewable energy subsidisation and payments under the Common Agricultural Policy (CAP), legitimised by an emergency narrative around decarbonisation, have created exceptional profit opportunities for capitals both from within and without the territory, as Tietz (2017) shows (see also subsection 8.3.3). In short, it appears that a *spatial fix* legitimised through a 'green' rhetoric is in place. For such a fix to be effective,

[80] The kombinat were large industrial conglomerates dependent directly from the DDR ministries.
[81] See also (Giacchè, 2013).

space, that is agricultural land, must be accessed and controlled, by leveraging existing land dynamics and the underlying ownership regime.

8.2.2 Biogas on East-Germany cheap and concentrate land: old concentrations and new appropriations

This subsection conducts a socioeconomic analysis with an historical perspective of the current land dynamics in the fieldwork region, as they are characterised by low prices and a concentrated ownership regime. Towards this purpose it identifies three distinct periods: (i) before Germany unification in 1871; (ii) after World War II since 1945 and (ii) after Germany's reunification since 1990.

Land dynamics in east Germany and the fieldwork region are the result of two radical and long reform processes. The first started in 1945 under the DDR state and collectivised agricultural land and the agricultural sector over several decades. After the fall of the Berlin's wall in 1989 and the reunification of Germany the following year, the second process reprivatised both land and the agricultural sector on the basis of neoliberal capitalism principles (Weber, 1993; Giacchè, 2013). In order to contextualise both processes, it is important to notice that by 1945, east Germany's land ownership regime had endured a centuries-long process of concentration (see subsection 8.2.2), which we can retrace through a sociological perspective centred on the landlord class dominating Prussia, the most powerful of the states that dissolved into the German Empire in 1871. The fieldwork region was once partially enclosed into Prussia's western territory. This was characterised by large estates owned by a landed aristocracy, known as the *Junkers*. Originally the term designated a less noble status for aristocrats not invested with knighthood. Throughout the centuries, Junkers climbed military and society's ranks mustering power and large estates, especially east of the river Elbe. In modern times, the Junkers class eventually became the most influential in Prussia, the German Empire and later the Weimar Republic. At the turning of the XX century, the Junkers, modernised their farms, by reducing their sizes and improving productive techniques, and, on the other hand, protected their interests by achieving the introduction of a protectionist tariff on American grain and meat import. Very relevantly to the focus of this research, the Junkers gathered considerable power and capital monopolising corn supply by storing it and consequently manipulating prices.

Already at this point in history, two essential elements of biogas sector were in place: corn and large estates (Taylor, 2001; Hagen, 2002).

Junkers mainly exerted their political influence through the German Conservative Party, in parliament, and the Agriculturists' League (Bund der Landwirte), in civil society. Similarly, to other landed aristocracies, Junkers were reactionary and opposed to both liberalism and socialism, as their siding with the Monarchy against the 1848 revolution testifies to. When, after World War I, the Weimar Republic abolished the Junkers' aristocratic privileges their weight in agriculture and the military remained essentially intact (Muncy, 1947; Hagen, 2002). Junkers' relationships with the Weimar Republic's successor regime, the Nazism, were cooperative. Although Nazism was a party with a commoner at its head, namely Adolf Hitler, the Junkers, sympathising with its ultra-nationalist and anti-Marxist stances, took it as a minor evil. They therefore hailed Hitler's rise to power with favour and saw their agricultural revenues vastly benefiting from Nazism's protectionist and autarky policies (Neumann et al., 2013).

At the end of World War II, Germany was split into two states, with then Germany's eastern territory partially coming under the control of the DDR in the orbit of the USSR (Di Nolfo, 1994). Between 1945 and 1949, the first of the mentioned reforms took place, which was known as the *bondreform*. Landowners (including the now disgraced Junkers by reason of their status of landed aristocracy and contiguity with Nazism) were expropriated. Agriculture, and the economy overall, was collectivised and put to central planning, with the aim of modernising and industrialising it and, in accordance with a Marxist-Leninist model of socialism, ensure full employment while levelling up agricultural workers' living standards to those of industrial workers. What is more, the new international order dividing Europe in two opposing blocks, prompted DDR's governments to reduce dependency on agricultural imports, as a way to stabilise food supply. All the estates larger than 100 ha were expropriated, making in 1949 the state-owned land rise to 3.3Mha (Bauerkämper, 1996; Weber, 1993; Last, 2009). Of these, 2.2Mha were redistributed to peasant farmers, whilst part of the remaining 1.1Mha was entrusted to state-owned farming corporations (Volkseigenes Gut – from now VEGs).

Between 1952 and 1960, DDR intensified collectivisation, to further industrialise the agricultural sector. Smallholders were urged to consolidate their holdings and form large

cooperatives (Landwirtschaftliche Produktionsgenossenschaften – from now LPGs). Although land kept being formally owned by individual farmers, LPGs had the full right to manage it. Moreover, the income LPGs generated was distributed amongst LPGs' members basing on labour units[82]. LPGs were administered by hierarchical boards, with a chairman in a leading role. They exceeded the mere production management by and large and performed at the local level functions also in the infrastructural, social and cultural fields. The state pressure towards farms consolidation further increased by 1962 and was coupled with a process of productive specialisation. By 1988 slightly less than 5000 farms operated 95 percent of DDR's agricultural land and only 465 were owned by the state (Beckmann, 1995; Hagedorn, 2014).

A dramatic change of land ownership regime and agriculture was about to happen again transforming collective and state landholdings into private entities and navigating a state planned economy into capitalism. The privatisation developed around the core discontinuity between a system organised according to Marxism-Leninism and a capitalist one: the property right. Under the new system, LPGs could be converted into one of the legal forms that the Germany Federal Republic's corporate regulatory system recognises. After 1990, almost the totality of the 3844 LPGs were turned into cooperatives and limited liability companies (Streith, 2011), with an average of 1338 ha each (Knaebel, 2015). On the other hand, agriculture and forest land which was property of the 464 state-owned companies[83], was entrusted to Treuhandanstalt (also known as Treuhand), the institution that led DDR's economy privatisation, and from 1992 to a limited liability company owned by the Federal Republic of Germany: the Bodenverwertungs- und -Verwaltung or BVVG. It is estimated that some 3700Mha was placed under the control of BBVG, although exact figures are impossible to define (Klages, 2001; Giacchè, 2013). As of today, BVVG has sold almost all the land it owned[84], mainly to LPG successor companies which could buy or lease land at an

[82] Other principles were: (i) all able-bodied members were obliged to work; (ii) peasants kept bare land ownership, but LPGs had full managerial control over land; (iii) private plots below 0.5ha were permitted (Beckmann, 1995).

[83] The Volkseigener Betrieb (VEB) were directly owned by the State and owned by state officers, differently from LPGs whose assets were owned by their workers who, formally at least, controlled the board (Giacchè, 2013).

[84] In 2017 BVVG still held 136,700 ha, ads reported by Germany's Federal Ministry of Finance at https://www.bundesfinanzministerium.de/Monatsberichte/2020/02/Inhalte/Kapitel-3-Analysen/3-3-bodenverwertungs-und-verwaltungs-gmbh.html.

incredibly favourable price if compared with average price in western Germany states (Gerke, 2018; Brunner, 2019; Küster, 2002; Heuser, 2015).

The privatisation of LPGs and the land market allocations by BVVG are the most recurrent themes in the interviews. Of the farmers that were interviewed all acquired at least a part of their land through either the partial or full acquisition of an LPG successor company's assets or by buying it from BVVG. An interview with a farmer, whose name is Otto, exemplifies that. He was born in a North Rhine-Westphalia village and graduated in agronomy. He was one of the first militants of the Green Party with political belief orbiting in the field of the Christian conservatism. In the mid-1990s, he decided to take advantage of cheap land in Güstrow, Mecklenburg-Vorpommern, bought 500ha of land and built his own farm, producing milk, slaughter caws, rye, wheat and corn, which he sells to the largest biomethane plant in the world at the time of writing, located in the same city. When he was asked what the most important DDR's legacy was, with the expression of someone saying something obvious, replied:

> "The industrialisation of agriculture. That is something substantial in the way farmers relate to land here, that comes from the DDR's era. Here it's rare to find farms below 400ha. And this is something that comes from socialism. Their idea was to level up agriculture to an industrial capacity, by consolidating properties and raising farmers to the standards of industrial workers, also in terms of class consciousness, as it would have been said back then. In short, this meant the destruction of family farming. The bonds connecting communities with land where simply wiped out. They were replaced with large, industrialised estates with a high degree of productive specialisation. The main actors of this system were the LPGs. But they were not just about agricultural industrialisation. They were a pivotal element of rural communities' social and political life. They fulfilled functions beyond simple farming, they were a sort of small institution, for better or worse. The rural life before bodenreform was in a way replaced by these new social forms, recreating a different way of being and working together. When reunification and privatisation came, communities' relation to land was disrupted again but the large and concentred property structure stayed the same[85]" (Otto – Farmer-Activist/DE-1, Spring 2018)

[85] East-Germany land privatisation is categorised by critical scholars and activists as land grabbing (see chapter 3), in resonance with similar processes happened in other eastern Europe former socialist states, which followed a comparable fate of large-scale state-driven privatisation (Brunner, 2019; Gerke, 2018; Kay et al., 2015).

Not only were land concentration and agriculture industrialisation two characteristics passing the transition intact, as we can deduce from Otto's testimony. Persistence can also be observed in terms of elite circulation. In many cases the LPGs cadres recycled themselves as managers of the new business entities (Bauerkämper et al., 1997; Bauerkämper, 2005; Last, 2009; Gerke, 2018). This fact, which emerged recurrently during fieldwork from interviews and direct observation, is a the centre of Juli Zeh's famous novel "Unterleuten" (2016). That is the story of a fictional Brandenburg's village, Uterleruten, whose community is traversed with unquenched tensions because of an incumbent renewable energy project. Those tensions are embodied in the story of the Unteleuten's land and its use. The "Ecologika", an LPG successor cooperative, owns the land whereon the renewable energy project is to be developed. Ecologika is chaired by Gombrowsky, the heir of a family that owned the land before the bondereform. Back then, land was collectivised and transferred to an LPG, which would later become the Ecologika. Although Gombrowsky was likely belonging to a landed aristocracy family and was expropriated by the DDR's collectivisation process, he managed to become the LPG's chairman. He therefore entered the local DDR's nomenklatura, and endured the post-1989 privatisation process, remaining in place as the Ecologika's chairman until the early 2000s when he tried to rent part of its land to a renewable energy developer, seeing this as the sole option to keep the crumbling Ecologica running. This story was suggested to me by Veit, who chairs a German peasant farming NGO. During an interview he used Zeh's novel to describe the land and class dynamics of the transition after 1989. He emphasized that:

> "Veit: Juli Zeh's novel is not fiction. I mean…the characters are obviously invented and the story too…but the Unterleuten's never quenched tension around land are real and it is something you can hear from people who lived that period. And many Gombrowskys can be found in companies that succeeded LPGs in east-Germany. He is a great character because it embodies three fundamental phases of land history down-there [east Germany]: collectivisation, privatisation and the moment land became a speculative investment asset, also with the help of a hyper subsidised bioenergy. Throughout this bumpy transition processes, many LPGs' cadres managed to keep their position of power: Gombrowsky is one of them.

> Samadhi: if we considered socialist cadres, what do you think was their role in giving land and agricultural structure the shape it has in east Germany today?
>
> Veit: well, it's difficult to prove but I have an idea about that. But let's try by sticking to facts. With the German reunification, all these people chairing the LPGs were facing two options, either abandoning their privileges or reinventing themselves as managers and businessman. Many chose the second. I mean…why shouldn't they? The cooperatives they chaired would manage huge land extents and they already had the necessary know-how to run large-scale operations.
>
> Samadhi: did that happen smoothly, without any resistance from capitals from west-Germany? After all, they might well have become competitors, with access to cheap and fertile land...
>
> Veit: that is a good point. The thing is that they were smart…investors from the west saw a huge opportunity in the privatisation of the DDR's land and literally started a land rush. In many cases they didn't buy land directly, but purchased shares of agricultural companies, also to circumvent legislation restricting direct land purchase. And here is the role played by socialist cadres. They facilitated the access of western capital into east Germany agricultural sector by becoming business partner with them.
>
> Samadhi: how then does biogas fit in all that?
>
> Veit: well, that energy crops had been seen as a backup for the agricultural sector well before they became a renewable source it's a known fact. And east Germany was the perfect solution…large estate and cheap land, where to grow large grain monocultures, with the help of subsidies from both the CAP and EEG…I mean…it's the perfect storm…if I were a farmer or a member of a farmers' organisation, I would use all my influence on decision makers to keep public money flow into energy crops" (Veit – National NGO's member/DE-1, Winter 2018)

By combining Otto and Viet's testimonies, it is possible to trace a number of recurring elements and draw insightful considerations key to understanding accumulation patterns around biogas production in the fieldwork region. First, land concentration and a large-scale industrialisation are two substantial trends characterising the fieldwork region agricultural sector and directly converging into the biogas value extraction chain organisation. They have a long-term course, with their roots sinking back to the DDR era and before.

Reunification, transition to capitalism and land privatisation, as distinct elements yet merged in a complex historical dialectic, have entailed some circulation of LPGs cadres, as part of the DDR's elite. In order to keep their roles and status, many of them adapted to the new course and supported the transition to capitalism, becoming part of the agricultural investor faction within the capitalist class and turning themselves into managers and shareholders of LPG successor companies. Because of the specificity of the transition processes and of the strict regime on direct land acquisition, LPG successor companies came to be the most important gatekeeper to east Germany, and fieldwork's region, lands. The latter cheapness and the possibility to capture both agriculture and renewable energy subsidies attracted capitals from west Germany and other European countries, which could rely on two strategies in order to lay their hands on those lands. One was to buy shares of an LPG successor company, hence including land it owned. The other was to rent or acquire land from BVVG. In the first case, LPGs cadres found themselves playing an important mediating function, within the framework of a liberalisation path designed by ordoliberal legislation (see chapter 6). LPGs cadres, in fact, conducted negotiations with external capitals facilitating the latter's access to east-Germany's land market, although within the framework of a sometimes adverse market relation (Hickey and Du Toit, 2013). This is going to be a focus of what follows.

8.3 The political economy and ecology of biogas generation in Brandenburg and Mecklenburg-Vorpommern

This section explores surplus value extraction and accumulation in and around the generation of biogas from agricultural substrata, as a case of 'green' capitalism at work (see chapter 3). It discussed five distinct themes throughout as many subsections. The first subsection provides an overview of basic data about biogas generation in Germany and in the fieldwork region, with a focus on its spatial organisation. By applying the notion of *territorially based alliance* elucidated in chapter 4, the second subsection identifies classes, class factions, groups and actors observed at the territorial level and coalescing along the different segments of the biogas value extraction chain. Through a historical perspective offered in section 8.2, the third subsection examines the process whereby the fieldwork region's lands have been abstracted into financialised forms of fixed capital and incorporated

within pattens of 'green' accumulation in and around biogas generation. Thanks to its focus on the long-term and large-scale process of land concentration and enclosure, it shows how the cheapness of land, its concentrated ownership regime interplayed with sustained value streams from public subsidisation in providing a formidable fixture to capitals seeking excess profits and, therefore, underlying an intensive cycle of capital accumulation around biogas since the early 2000s. The patterns through which value is extracted and redistributed along the segments of the chain and the nodes of the territorially based alliance is discussed in the fourth subsection. Through a modelling of two biogas plants with different productive specialisations, the subsection explains in detail how revenue structures and distribution patterns are organised and how they result in specific spatialities at the territorial level. In conclusion, by piecing together all these elements, the fifth subsection delves into the alterations triggered by extraction and accumulation of surplus value through the combination of heavy subsidisation and land commodification. The transformative power of these socioecological dialectics is taken up through the categories of nature and space and production, extended enclosures and *territory grabbing*, as they impact at different scale and depth on both the bio-physical and socio-economic spheres. From this perspective, landscape and space are considered a mirror of the socioecological transformations that the *territory* undergoes as a result of expanding capitalist relations of production.

8.3.1 The biogas miracle in Germany

Germany is a forerunner and a world leader in renewable energy transition. In 2020, more than 44 percent of the country's primary energy consumption[86] came from renewable resources[87]. Germany is also one of the biggest producer of biogas in Europe with a volume larger than the UK and Italy, the second and third in the rank, by respectively 63 and 75 percent (Daniel-Gromke et al., 2018; Eyl-Mazzega et al., 2019)[88]. In 2017, 13 percent of all

[86] Source: DESTASIS, Germany's national statistical service. Date accessed: 10-01-2021.

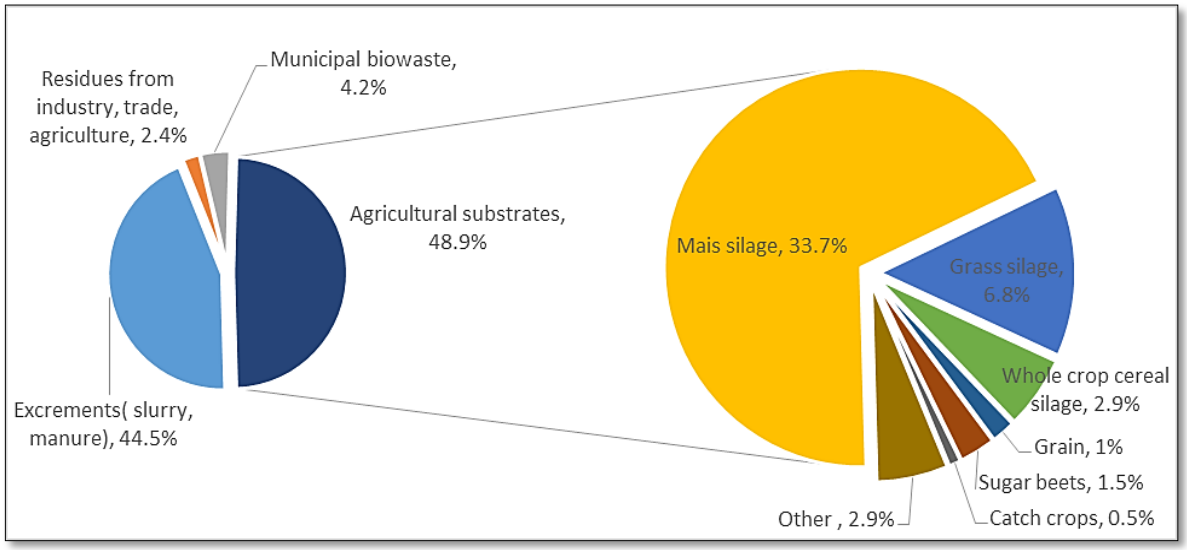
[87] According to Germany's legislation (German Bundestag, 2012) biomass energy derives from : (i) plants and their parts; (ii) energy sources produced from plants and their parts; (iii) waste and by-products of either plant or animal origin, generated by the agricultural, forestry or fishing industry; (iv) biowaste; (v) gas produced from biomass through gasification or pyrolysis, including secondary and by-products; and (vi) alcohols produced from biomass, entirely generated from biomass.

[88] Thanks to biogas in 2016 18,353 Metric Tonnes of CO_2 equivalent were saved (FNR, 2017). However, it is important to consider that figures on GHG avoidance from the use of biomass-based fuels are questioned by scholars and activists, since it is hard to accurately calculate emissions deriving from indirect land us change

Germany's agricultural area was cultivated to grow energy-crops, amounting to more than 2.180Mha[89]. Of these, more than two thirds fed the biogas sector demand for energy crops (FNR, 2012; FNR, 2013; FNR, 2017), consisting mainly of corn silage (see Figure 8.4).

Biogas plant number and installed capacity have grown constantly since the 1990s and with a boom between 2002 and 2012 (see Figure 6.2). However, since biogas is deeply related to the agricultural sector, its development has evolved along different trajectories in west and east Germany. The two regions have, in fact, a profoundly different land structure. In the east the property ownership regime is on average more concentrated, with larger landholdings (see subsection 8.3.1).

Figure 8.4 Biogas fermentation substrata in 2017



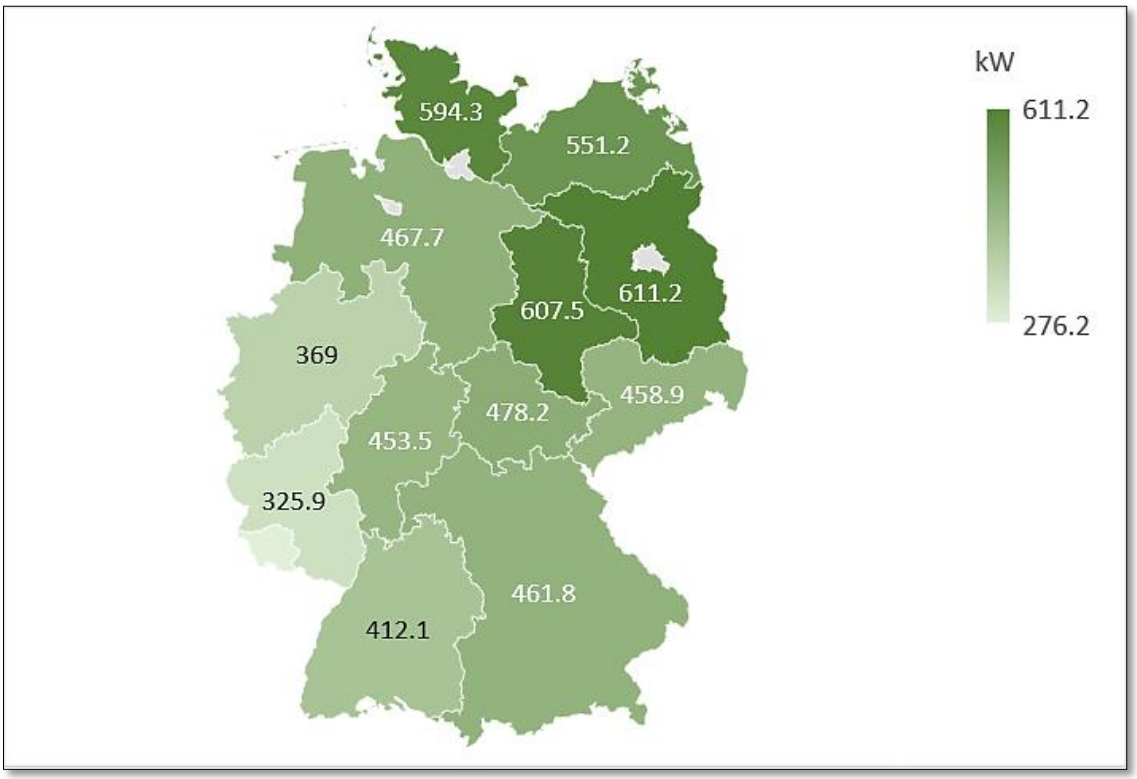
Source: Fachagentur Nachwachsende Rohstoffe and Agentur für Erneuerbare Energien

(ILUC). Forestry and agriculture are the upstream segments of biomass (and biogas) values extraction chains. Loss of forest soil to the expansion of monocultures or other biomass supply systems has an indirect, yet extremely significant, impact on the final GHG emissions on a global scale (Angelo and Du Plessis, 2017; Bhatia, 2014; Prasad and Ingle, 2019).

[89] The industrial production of energy-crops is operated through intensive monocultures. The risks posed by these methods pose in terms of biodiersity loss, soil degradation, chemical contamination and ultimately GHC emissions are widely acknowledged (Angelo and Du Plessis, 2017; Bhatia, 2014; Prasad and Ingle, 2019).

Zooming into the fieldwork region, we can observe the convergence of three factors. First, a larger farmland holding average size, which in Brandenburg and Mecklenburg-Vorpommern, amounts to 274.9ha and 247.4ha compared to the national of 60.5ha. Second, a larger electricity productive capacity for biogas plants which is respectively of on 611Kw and 551.2Kw against a 531Kw national average and 522Kw west-Germany average (see Figure 8.5). Third, a stronger growth of the agricultural area farmed to produce green maize, the most productive fermentation substratum for biogas. Between 2000 and 2019 that increased by more than 135 percent, against a national rate in the same time span of 98.9 percent[90].

Figure 8.5 Average electricity productive capacity for biogas plants by federal state



Source: Agentur für Erneuerbare Energien

8.3.2 Between agriculture and renewable energy: Biogas as a territorial alliance

Specific sociotechnical conditions as diverse as pre-existing productive specialisation, significantly cheaper land, and public subsidisation policies are all conditions that may

[90] Source: Eurostat. Date accessed: 09-11-2020.

encourage the formation of a *territorially based alliance* (Harvey, 2018b p. 419). Within that, different factions of capital, regional or lower articulations of the administrative system, factions of the working class can cooperate in a value extraction chain redistributing value, power and privilege. Territories become arenas wherein different classes and factions can cooperate (or conflict) within specific spatialities and positionalities, legitimised by continuously reframing hegemonic narratives and shaped by power balances prevailing historically in the wider society. The territorially based alliance around agricultural biogas generation in the fieldwork region is the focus of this subsection.

This alliance includes a range of investors, as diverse as agricultural companies, pure biogas producers[91], energy service companies, financial investors, energy utilities, plant builders, technology manufacturers and agrochemical producers[92]. All of these entities operate in the two main segments of energy production and distribution and energy crops supply. They relate each other in complex ways depending on (i) their capital endowments, (ii) the function that biogas production plays in their accumulation strategy and (iii) their capability to influence the regulatory framework, and specifically permitting and control mechanisms.

Agricultural companies generate biogas in order to feed their internal energy demand and secure an additional income source by selling excess energy. Those running cattle breeding operations also recycle manure into fertilisers and compress costs from manure disposal. In these cases, biogas is deeply integrated in the agricultural productive cycle. However, this is not the only function related to the biogas value extraction chain that agricultural companies perform. They also produce and supply energy-crops, mainly corn silage.

The latter is bought by pure *biogas producers*, whose sole business is to produce and sell biogas and energy from it, or large agricultural corporations, with branches dedicated to biogas production (see KTG agrar case in subsection 8.3.3). Besides simple supply contracts, pure biogas producers and agricultural companies can interact through more articulated arrangements. Biogas contracting is one of them, whereby pure biogas producers,

[91] Companies whose sole business is to produce energy from biomasses and specifically biogas.
[92] The discussed actors and capital factions were identified though a simplification process. For the sake of clarity, categories have been postulated as playing plainly defined roles, in a specific segment of the value extraction chain, whereas in realty roles and functions often overlap and blur into each other.

acting as energy service companies (ESCO)[93], finance, build and operate a plant on a plot owned by the agricultural company which also supplies energy-crops. This horizontal integration scheme is quite common enabling business strategies where fermentation substrata supply is secured without directly buying or renting land (Güstrow, 25-05-2018).

Financial players active in the fieldwork region position along the value extraction chain depending on their business model, the size of the financed investment and overall market fundamentals. Banks usually provide debt capital. Basing on interviews (Interviews with Investor/DE-2, 4, 5, Spring 2018; Investor/DE-3; Summer 2018), up until biogas subsidisation was capped in 2014, banks lent money easily with a large use of schemes, such as project financing, limiting borrowers' liabilities. A sustained level of subsidisation was also attractive for investment funds, which channelled millions of euros into the chain by buying biogas producers' equity shares (see below the AC biogas case).

Gas supply companies and energy utilities are active since 2004. Consecutive legislative innovations created the market space to inject biogas upgraded to biomethane into the grid. As Bruns (2011) illustrates, conventional gas suppliers welcomed the novelty. In fact, they could now add 'green' gas to their supply mix and become able to greenwash their reputation of polluters linked to fossil fuels. In 2008 Germany's Energy Agency (Deutsche

[93] According to the Joint Research Centre of the European Commission an ESCO is (European Commission, n.d.2) "a company that offers energy services which may include implementing energy-efficiency projects (and also renewable energy projects) and in many case on a turn-key basis. The three main characteristics of an ESCO are:

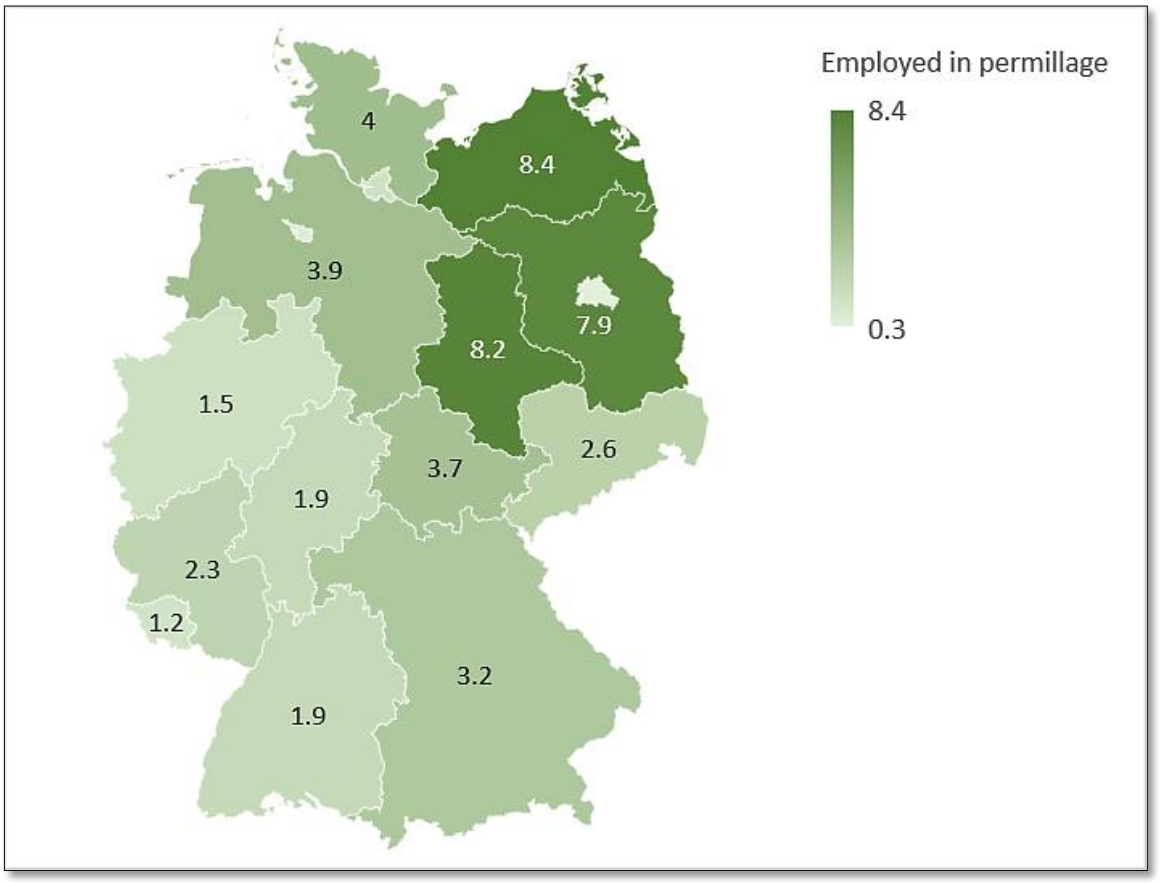
- ESCOs guarantee energy savings and/or provision of the same level of energy service at lower cost. A performance guarantee can take several forms. It can revolve around the actual flow of energy savings from a project, can stipulate that the energy savings will be sufficient to repay monthly debt service costs, or that the same level of energy service is provided for less money.
- The remuneration of ESCOs is directly tied to the energy savings achieved.
- ESCOs can finance or assist in arranging financing for the operation of an energy system by providing a savings guarantee.

Therefore, ESCOs accept some degree of risk for the achievement of improved energy efficiency in a user's facility and have their payment for the services delivered based (either in whole or at least in part) on the achievement of those energy efficiency improvements.

Another category of companies that offer energy services to final energy users, including the supply and installation of energy-efficient equipment, the supply of energy, and/or building refurbishment, maintenance and operation, facility management, and the supply of energy (including heat), are Energy Service Provider Companies (ESPCs). They may be consultants specialised in efficiency improvements, equipment manufacturers or utilities. ESPCs provide a service for a fixed fee or as added value to the supply of equipment. ESPC may have some incentives to reduce consumption, but these are not as clear as in the ESCO approach. Often the full cost of energy services is recovered in the fee, so the ESPC does not assume any risk in case of underperformance. EPSC is paid a fee for their advice or equipment rather than being paid based on the results of their recommendations".

Energie-Agentur, from now DENA), a mixed public and private body[94], launched the *biogaspartner* initiative, a platform of cooperation bringing together gas industry players, biogas producers and energy crops suppliers[95]. Undoubtedly, this expanded the depth and extent of the biogas value extraction chain also throughout the fieldwork region which now could intersect the fossil gas distribution market (interview with Hans, Berlin 12-06-2018).

Figure 8.6 Employment in the bioenergy sector in 2016



Source: Agentur für Erneuerbare Energien

Plant developers and technology manufacturers produce the most important elements of the fixed capital needed to produce biogas. In return they receive a significant portion of the surplus value flow sustained by cheap land and public subsidisation (see subsection 8.3.4). Thanks to this, some of the early comer companies managed to become international players exporting technology globally and ease their dependence on the regional

[94] DENA's key shareholders are the German Federal government and major financial players such as KfW Bankengruppe, Allianz SE, Deutsche Bank AG and DZ Bank AG. See https://www.dena.de/en/home/
[95] See https://www.biogaspartner.de/en/start/

and national market. Paradigmatic is the case of a EnviTec Biogas[96], a multinational company specialised in plant developing and management services. In the fieldwork region, the company built the two largest plants it the world, at the time of writing. One is located in Brandenburg nearby the Polish border and, at full capacity, converts the biogas it generates into 20 MwH of electricity, whilst the other is located in Güstrow, a village of Mecklenburg-Vorpommern and processes 10,000Nm3/h of raw biogas into biomethane. In the company's website we can read how important was the role of subsidisation for its success:

> "The [company's] entrepreneurs combined a multi-year experience in plant engineering and project developing with a know-how in agricultural operation management. At the same time, the decision makers set regulations granting dispatching priority to renewable energies (EEG) and introducing subsidies for feeding energy from biogas into the local grid. All this paved the way for investment. Biogas so became an attractive revenue source, letting the entrepreneurial success story of EnviTec Biogas begin" (EnviTec Biogas, n.d.)

Supplying chemical inputs for energy-crop production permits *agrochemical companies* to capture a substantial share of the value extracted through biogas production. The increased demand for energy-crops has resulted int the expansion of energy-crop intensive monocultures needing fertilisers, herbicides and pesticides. During fieldwork, partnerships of agrochemical companies directly cooperating with agricultural companies could be observed. The case of Agro-Farm GMBH Nauen[97], controlling 2500 Ha northwest of Berlin, is exemplar. The company partners with Bayer Forward Farming[98]. That is a program launched by the Bayer-Monsanto agro-chemical giant targeted to offer alleged "sustainable solutions" though a "proactive" cooperation (BAYER, n.d.), which in the Agro-Farm GMBH Nauen case include the production of corn silage and oilseed rape, both sold as energy crops.

A portion of the value extracted form biogas generation is redistributed to factions of the *labour* class through wages. We have seen above that the renewable sector weighs comparatively more in the fieldwork region then anywhere in Germany. A deeper look into

[96] See https://www.envitec-biogas.com/
[97] See http://www.agro-farm-nauen.de/
[98] See https://www.cropscience.bayer.com/people-planet/global-impact/forwardfarming

bioenergy (including biogas and other biofuels), shows that in 2016 the fieldwork region for every 1000 workers 8.2 were employed in the bioenergy sectors, compared to 6.2 in East Germany and 2.7 in Germany overall (See figure 8.6).

State institutions, from the local to the national level capture a portion of value from the biogas extraction chain through taxes. The main tax revenues for local institutions flow from the trade and property taxes. In recent years, the allocation of the trade tax revenue[99] has been quarrelled between federal states and central institutions. Specifically, federal states housing extensively renewable energy plants object that the trade tax revenue should be allocated into their budgets, rather than into those of the states or local institutions where the headquarters of the plant owning or operating companies are located.

The relations amongst the factions, groups and actors above discussed are informed by the historically stratified power balances amongst classes within society, from the local to higher level, and are legitimised through hegemonic narratives, with the interdependency of both determining the territorially based alliance internal and external relational dynamics. We will explore the implications of all this in subsection 8.3.4.

8.3.3 Biogas generation: a driver to land abstraction and financialization

From a historical materialist perspective, renewable energy plants turn an ecosystem biotic or abiotic flow into an energy commodity through a combination of variable capital (labour power) and fixed capital (means of production). The latter, in the case of biogas, are mainly fermenters and electricity generators. Yet, biogas production techniques and technologies cannot exploit an ecosystem biotic or abiotic flow as straightforwardly as others (see chapter 3 and 7). For instance, whilst wind turbines are capable of directly converting wind into electricity, agricultural biogas can only be generated by first sourcing and processing combinations of bio-physical elements such as energy crops or residues from agricultural productive cycles (Harvey, 2018b; FNR, 2014).

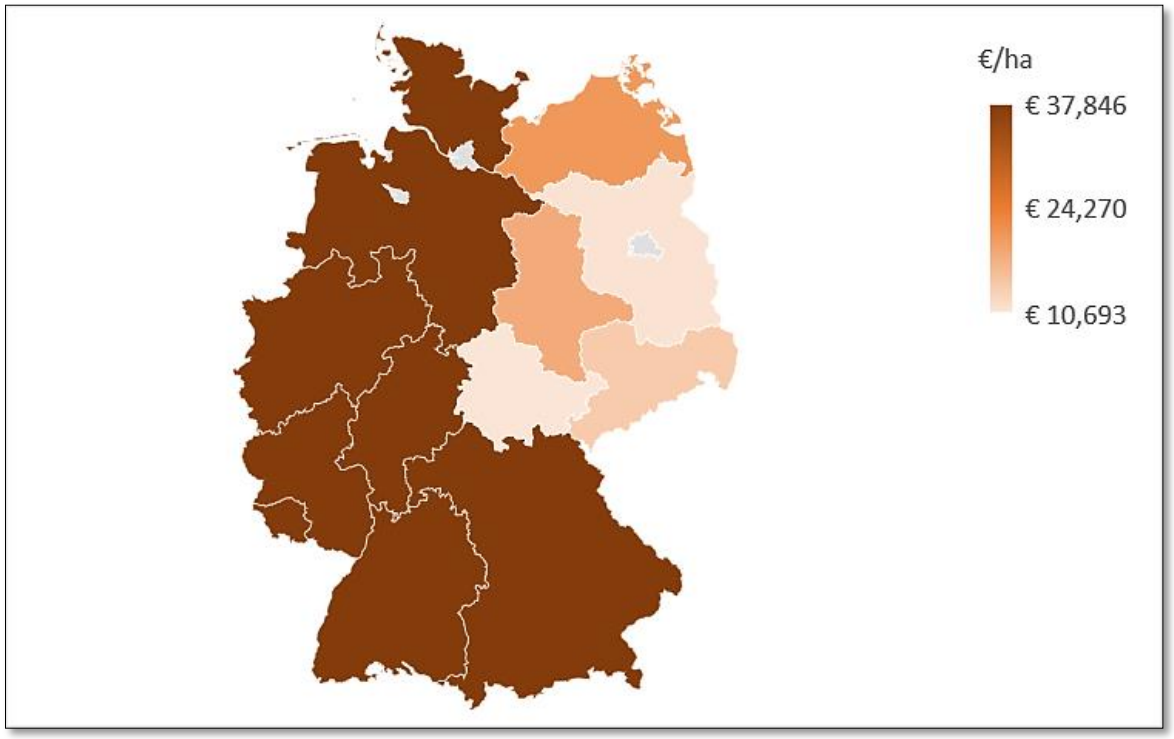
The centrality of agricultural soil to biogas generation suggests that soil fertility and its cheap accessibility can serve as *fixtures* to capitalists constantly seeking to increase excess profits working, by the same token and at a higher systemic level, as a *spatial fix* to over-

[99] See https://www.gesetze-im-internet.de/gewstg/

accumulated capital (see chapter 3). These conditions, alongside sustained value streams from subsidisation policies, can explain why in the last two decades national and international capitals targeted the fieldwork region land to invest in both biogas and the production of energy crops (Tietz, 2017; Brunner, 2019).

This subsection investigates the processes through which land cheapness and its concentrated ownership regime have underlain the extraction and accumulation of surplus value in and around biogas generation, along the intersection between the renewable energy and agricultural sectors. Specifically, it shows how mutually reinforcing regulations, subsidy schemes and market mechanisms have accelerated the abstraction of land into financialised forms of fixed capital.

Figure 8.7 Average agricultural land selling price in 2019*



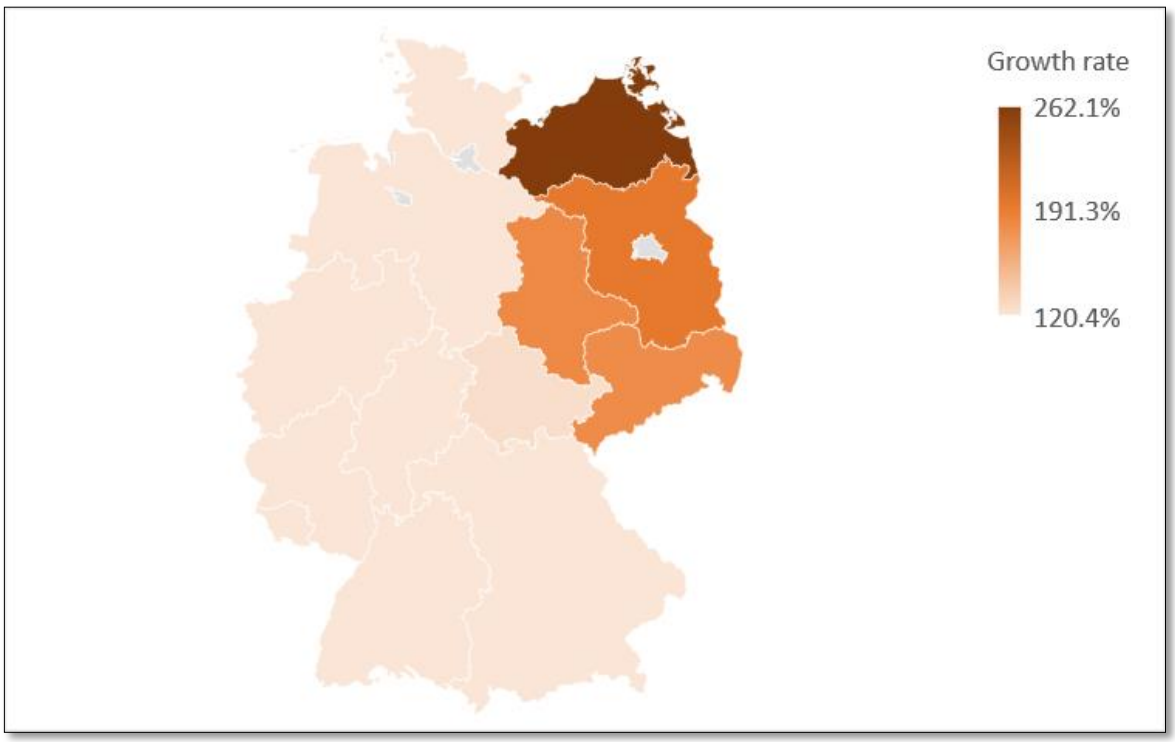
Source: Deutscher Bauernverband and Statistisches Bundesamt
*The chart shows a comparison between eastern states and western-states average prices

We can start by noticing that such an outcome, and its relevance to biogas and bioenergy production, can be fully comprehended solely if framed within the wider context of the DDR's economy liquidation after 1989. This, as it was driven by the BDR through a contested reunification process, worked as a place-specific devaluation (Harvey, 2018b p. 425), allowing western German capitals to get rid of competitor industries, acquire cheap

assets, including land, and realize excess profits (Harvey, 2018b; Giacchè, 2013; Knaebel and Rimbert, 2019; Knaebel, 2015). Importantly, capitals from western Germany could operate in a familiar and reassuring normative environment, their home country's one, inasmuch as the BDR's legal framework was simply extended to the DDR. The scale of the devaluation was so large that Cristina Luft, the DDR's last vice president in charge of economic policy, dubbed it as "the largest productive capital destruction in peacetime ever known" (Knaebel and Rimbert, 2019).

In a landscape of large-scale deindustrialisation, a concentrated land property structure survived the transition. On the one hand it did not pose any threat, in terms of potential competition, to western industrial capitals, specialised in high added-value secondary and tertiary operations, on the other it facilitated the appropriation of large land extents at a low cost. On them large scale agriculture could be expanded intertwining with biomass and biogas production, so allowing to capture value from both renewable energy and agricultural subsidies.

Figure 8.8 Agricultural land price inflation between 2008 and 2019*



Source: Deutscher Bauernverband and Statistisches Bundesamt
*The chart shows a comparison between eastern states and western-states average prices

While these factors worked as powerful drivers to land concentration -suffice to say that in 2016 a farmland holding in the fieldwork region was on average 261.5ha large, comparing to 67ha at national level (see section 8.2)- they were not counterbalanced by an adequate regulatory framework in the reunified Germany. Although legal restrictions are in place barring non-agricultural companies from acquiring agricultural lands larger than an extent between 0.2 to 2ha, depending on sub-federal regulations, nothing forbids those companies to buy shares of agricultural companies and so acquire also the lands amongst their assets. Furthermore, once a non-agricultural company has bought an agricultural company, or its shares, it also becomes entitled to directly buy land on the market and from BVVG (Tietz, 2017).

The reunification process also substantially contributed to compress land prices compared to the rest of the country. This is obviously a main consequence of the large socio-economic divide between the new federal states and the western ones, including the specific conditions in which state-owned land was privatised by BVVG. Between 1996 and 2007 agricultural land was privatised often selling it for prices slightly above zero. In 2003, in the fieldwork region, land was privatised for six to ten times less than eastern Germany's average price and ten to forty-six times less than the western Germany's average price (Gerke, 2018). As a result, in 2018 the market price of eastern Germany's land was half that in western Germany (see figure 8.7 and 8.8). Yet, low though they might be, in the fieldwork region agricultural land prices increased steadily and at stronger rate than anywhere else in the country between 2009 and 2018. More specifically, In Mecklenburg-Vorpommern and Brandenburg they rose respectively by 262.1 and 195.6 percent, as opposed to a 120.4 increase in west-Germany (Gerke, 2018; DVB, 2019; Herre, 2013). This signals a rush to land implying land grabbing and enclosure through market mechanisms (see also subsection 8.2.2) blocking access to land to small farmers and those with limited funds overall (Borras Jr et al., 2013).

8.3.3.1 How biogas contributed to transforming land into a cheap and lucrative asset

In subsection 8.2.2 we have identified three different historical phases in the fieldwork region land dynamics, with the aim of retracing the transition from pre or older capitalist forms of land relations into more efficient ones in terms of capital accumulation, this

entailing the transformation of land into fictitious capital[100]. Specifically, we have explored the socio-historical dialectics that have informed the concentrated ownership regime and cheapness of lands in the fieldwork area and eastern Germany, from before German national unity in 1871, to land collectivisation under the DDR after 1949 and the privatisation following the country reunification in 1990. Yet, a tile is still missing from the puzzle.

If, as seen above, land ownership concentration and low prices combined with robust value streams from renewable energy and agricultural subsidisation schemes, under national and EU-wide policies, and made the demand for energy-crops (Gerke, 2018; Brunner, 2019; Kay et al., 2015; van der Ploeg et al., 2015; Herre, 2013) a palatable accumulation opportunity[101], other exogenous factors contributed to intensifying land commodification and financialization. These were precisely the consequences of the financial crisis erupted between 2007 and 2008, which induced large-scale divestment from riskier immaterial assets and reinvestment in safer material ones. Amongst those there was agricultural land (Franco et al., 2013), which was deemed generally safer (Borras Jr et al., 2013). In east Germany this tendency intensified increasingly over the years, as monetary stimuluses for the economic recovery determined permanently low interest rates throughout western economies (idem). In such a macroeconomic context, acquiring land to access the agricultural and bioenergy value extraction chains has been regarded as an investment option with returns potentially higher and safer than other financial assets (Borras Jr et al., 2013; van der Ploeg et al., 2015; Brunner, 2019).

As Andreas Tietz (2017) documented, a significant part of land acquisitions in east Germany at the end of 2010s took place as agricultural companies buying-ups performed mainly by non-resident capitals[102] operating at the national or international scale. The most intense activity of non-resident capitals was registered in Mecklenburg-Western Pomerania, where they performed 41 percent of agricultural company acquisitions,

[100] As we have seen in chapter 3, the notion of fictitious capital is introduced by Marx (1993) to define forms of capital, such as the financial assets, that have no inherent value, but are traded upon a claim on future revenues. In a fully unfolded capitalist market, land becomes a financial asset traded in "a special branch of the circulation of interest-bearing capital" (idem 347), granting the owner a title to appropriate ground rent.
[101] Thrän et al. (2020) show that the demand for corn as an energy crop interplayed with that for corn as fodder from the meat industry in expanding monoculture cultivations.
[102] Non-resident capitals have their headquarters outside of the investment area.

followed by Brandenburg and Saxony with respectively 36 and 32 percent [103]. Moreover, in 2017 half of the east Germany agricultural area was controlled by supra-regional non-agricultural investors.

Combining Tietz's work and fieldwork research, it is possible to deduce the existence of two distinct types of investors in the fieldwork region land market. Regional agricultural farmers, with a more traditional and less finalised business model, on the one hand, cooperate or compete, on the other, with corporate capitals using agricultural operations, and specifically energy crops production, to diversify their asset portfolio.

This difference resounds with the words spoken by Ulrich[104]:

> "We are a medium-sized agricultural coop. Our core business is producing corn, rye and milk. We also make biogas and sell part of the electricity we generate through it to the local grid. It's good money and is important for our coop, but it's not our main thing. All our business revolves around land and agriculture. Once, our neighbourhoods were more or less like us, but things are changing fast…It's known that multinational companies like the Steinoff Group or the Lindhorst group originally specialised in sectors as different as furniture production or real estate -all of a sudden- discovered an interest in agriculture. You can hear about this sort of people buying land everywhere around here the truth is that they consider land just as another investment. Today they are here because returns are good, but they will flee away as soon as the tide changes" (Ulrich – Farmer/DE-4, Autumn 2018)

An example of a national highly financialised agricultural company once active throughout east Germany and the fieldwork region is KTG agrar. Before it filed for bankruptcy in 2016 with a debt exposure of €600 thousand million, KTG agrar was the largest agricultural holding in the EU controlling some 46 thousand ha, 38 thousand of which located in east Germany and the rest in Lithuania and Romania. Its story starts from Putlitz, a northern Brandenburg village surrounded by cultivations of potatoes, run under the DDR by a state-owned company (see above). With land privatisation after 1989, the VEG was replaced by a company named PAE-Gruppe. Siegfried Hofreiter, a farmer from Bayern, the richest amongst all Germany's federal states, bought the PAE-Gruppe at the turn of the

[103] Smaller but considerable were also the figures for Thuringia and Saxony-Anhalt with 23 and 22 percent.
[104] For details about Ulrich as a participant to interviews see subsection 8.2.1.

millennium and established KTG agrar. The company grew rapidly thanks to an astute accounting and financial engineering, combining high debt leveraging, with cash flows from subsidies and continuous acquisitions of cheap lands and smaller companies. Bioenergy production was important in KTG agrar's business structure so that in 2012 it created an ad-hoc subsidiary company named KTG energie. KTG agrar and KTG energie were now owned by KTG Gruppe. The importance of biogas generation is described by Hofreiter in an interview he gave to the magazine Die Welt (Euler, 2013)

> "Die welt: Rapeseed and cereal price fell by up to 30 percent compared to the previous year's [2012] and the downturn could be not over yet.
>
> Hofreiter: Such fluctuations do not give us too much of a headache, because we only sell a part of our products on the world market, where we must live with the normal cycles. W*e use the majority of this in energy production through biogas plants* [emphasis added] and in product refinement. This way, we have built up an in-house hedging. In addition, the cost side works in our favour: energy, fertilizer and seed goods became cheaper.
>
> Die welt: What's next for biogas?
>
> Hofreiter: At the moment we have an output of 40 megawatts. This would provide energy to a city of 300,000 people. Sales amount to 50 million euros, which corresponds to a doubling in just two years – with an operating margin of more than 15 percent. By 2015, we want to produce 50 megawatts and increase sales again."

Thanks to its size, KTG gruppe was a large recipient of renewable and agricultural subsidies. Such a conspicuous and stable financial flow sustained the company's stock value protecting its reputation with creditors and stockholders, while keeping its access to capital markets open until it bankrupted (KTG Agrar, 2012; Euler, 2013; Zinke, 2019).

In conclusion, we can argue that against the backdrop of cheap and easily appropriable (fictitious) fixed capital (land), subsidised biogas generation opened a new accumulation horizon, intercepting both the agricultural and energy value extraction chains. This also entailed the sociotechnical integration of large-scale monocultural farming and biogas generation (interview with business developer, Braunschweig, 28-08-2018). One of the

tangible effects of this is the enhancement of corn as an industrial crop, as it is clarified by the Frank's testimony, a business developer at a seed enhancement company:

> "Corn is perfect for biogas generation not only for its high gas yield. It is also very easy to farm intensively. To give you an idea, whilst apple cultivation requires around 20 chemical application and oilseed rapes about eight, corn only needs an herbicide and insecticide a year. And…on top of that, just consider that since the end of the 1990s it is mainly hybrid corn being farmed around here, which is resistant to herbicides and insecticide and with yields, today, ten times higher than 10 years ago…" (Frank – Investor/DE-3, Summer 2018)

What remains to be seen is how such mass of value is appropriated and by whom. This is what we are going to address in the next section.

8.3.4 Surplus value distribution and uneven development

This subsection investigates the patterns through which the value extracted in and around a biogas plant is redistributed to the classes, factions and groups of the territorially based alliance. Specifically, through the modelling of two projects it discusses the revenue structure of biogas plants, focusing on the redistribution of profits, wages, interest, rent and taxes. The subsection analyses also the relation between capitals' *mobility* and *immobility*, intended as the rapidity with which capitals are able divest, as a driver of uneven geographical development at the territorial level (see chapter 3 and Harvey, 2018b).

Table 8.1 Simulated revenue distribution amongst members of a biogas territorial alliance

BP1			BP2
Substrata suppliers	**46.54%**	**38.15%**	**Substrata suppliers**
Substrata supplier 1	*43.34%*	**26.08%**	**Operating service providers**
Substrata supplier 2	*3.20%*	1.88%	*Maitenance*
Plant developers	**17.22%**	*20.30%*	*Other imputs*
Operational service providers	**17.19%**	*2.34%*	*Heat supply*
Maitenance	*6.83%*	*1.56%*	*Other services*
Other imputs	*8.76%*	**21.44%**	**Plant operators**
Other services	*1.60%*	**10.45%**	**Plant developers**
Plant operators	**13.32%**	**2.98%**	**Financial and insurance service providers**
Financial and insurance service providers	**3.95%**	*2.29%*	*Financial serveice providers*
Financial serveice providers	*3.03%*	*0.69%*	*Insurance service providers*
Insurance service providers	*0.92%*	**0.90%**	**Workers**
Workers	**1.78%**		

The major revenue source for a plant producing biogas, whether converting it to electricity *in situ* or upgrading it to biomethane, flows from public subsidies. Their direct recipients are agricultural companies producing biogas and pure biogas producers. If we take the case of a plant converting biogas into electricity[105], commissioned in 2012 and receiving feed-in premium subsidies (see chapter 6) 74 percent of revenues come from subsidization. It follows that it is impossible to speak of profit, since income from the electricity selling excluding subsidies cover less than 30 percent of total costs. As seen above, such a fact in energy economics is captured by the concept of grid parity[106]. Whilst with solar or wind systems, technology progress and cost reduction make the utility-scale grid parity reasonably foreseeable in the medium-to long term (Gu Choi et al., 2015), with biogas that is far from being achieved, "because economies of scale are impossible: corn price and biogas engine prices are stable over time and quantity" (interview with farmers, Nauen, 24-20-2018). The intensity of subsidies remains substantial also at a higher segment of the value extraction chain, where agricultural companies produce energy crops, with agricultural subsidies on production covering 51 percent of average farm income[107].

Summing it up, we find that renewable energy subsidies directly sustain energy-producers (both agricultural and pure biogas producers) and indirectly energy-crops suppliers, who, on top of that, receive agricultural subsidies. However, the cash flow generated by subsidies is also redistributed to the rest of territorial alliance members. Consider that relative weights of energy and agricultural subsidies over investors' revenues vary depending on the field of activity, whether it is agriculture or energy production, on which their productive specialisation rests. Plant developers and technology manufacturers are more dependent on energy subsidies. On the other hand, agrochemical companies benefit more from agricultural subsidies, and so do landowners, whist financial players indirectly extract value from both segments. State articulations collecting taxes related to renewable energy

[105] Estimates are based on a feasibility calculator was used. It is provided by The Board of Trustees for Technology and Building in Agriculture eV (KTBL). See footnote 38 and 108.
[106] See footnote 30.
[107] The calculation is based on the EUROSTAT Economic Accounts for Agriculture and considers subsidies on production (Date accessed: 20-04-2020). Those are directly linked to products, such as coupled payments, while 'other subsidies on production' refers to any other subsidies paid to farmers not linked to products, such as decoupled payments, wage subsidies, interest subsidies, environmental payments, less favoured area payments, over-compensation of VAT and disaster relief payments. Figures on subsidies weight on farm income would probably be larger if subsidies on product and intermediate consumption were taken into consideration.

plants and the factions labour class employed in relevant productive cycles too receive a share of the value from both subsidy schemes, with diverse intensities and combinations.

Let us now delve further into the value redistribution patterns. To simplify the task and make analysis results more readable, two projects have been hypothesised from now BP1 and BP2. The former generates biogas and transforms it into electricity *in situ* feeding into the grid 4.8 GW p.a. The latter upgrades biogas into biomethane for a total of 8.8 million m_n^3 p.a. It is assumed that operating and management (O&M) operations are performed by the plant owner. This choice allows to investigate the two main operative models characterising industrial scale biogas generation in the fieldwork area and analyse relevant subsidisation schemes and revenue structures.

Table 8.1[108] shows that the segments that absorb much of the value captured by both BP1 and BP2 is energy-crops supply. This is particularly meaningful and if juxtaposed to the fieldwork region concentrated land regime and describes the depth of the structural relationship between energy subsidies and the agricultural sector. However, substrata supply is operated often by a plurality of companies, while if we consider the largest value share captured by a single investor, plant operators are at the top. In both BP1 and BP2, value channelled into wages is the smallest share in the ranking. In BP2, where the production scale is sensibly larger[109], value to wage ratio is even smaller, weighing half of BP1's. At the bottom of the ranking, we find municipalities and local communities, which receive less than 1 percent of the project revenues[110].

Let us now consider capital mobility with respect to the different kind of investors and actors in the territorially based alliance. We can start by noticing that energy-crop suppliers (intended as farmers) and plant operator companies with a local or subregional scale are

[108] The assumed commissioned year is 2012, so to fall within the 20-year standard EEG subsidisation period. Warmth and fertilisers selling are excluded for reasons of simplification. For the calculations and estimates a feasibility calculator was used. It is provided by The Board of Trustees for Technology and Building in Agriculture eV (KTBL). Municipality shares were calculated basing on the fiscal regime in force as of May 2020. The calculator is available at https://daten.ktbl.de/biogas/navigation.do?selectedAction=Startseite#start.

[109] Bruns et al. (2011) notice that below 1000 NM^3 the inherent economies of scale significantly sensibly reduce revenue margins.

[110] To this should be added property taxes paid by famers supplying energy crops. This is one of the channels through which renewable energy value is flows into municipalities' budget. The other one is trade tax. Both are calculated by multiplying the taxable base by the municipality coefficient. In the fieldwork areas municipality coefficients are amongst the lowest in Germany, to attract investments.

mainly immobilised into the territory. The nature of their business and their scale do not allow for divesting and relocate quickly or to such an extent that the effects of place-specific devaluations can be avoided or mitigated (Harvey, 2018b). In this, labour and local institutions follow a similar fate; although they command no capital, they are ingrained in biogas territorially based alliances and value extraction chains, on which their incomes depend partially or fully. As a result, their narrow room for manoeuvre only let them to adapt to decisions of dominant capital's factions, unless they engage in some form of organised conflict. Differently, financialised capitals, whose scale is supra-regional, national or international, controlling assets in technology manufacturing, plant owning, operating, insurance or any other segment of the value extraction chain, are by definition more mobile. In fact, their scale and nature allow for relocating rapidly without posing any existential threat to their accumulation strategies.

The distinction between capital mobility and immobility is useful to interpret the place and sector specific devaluation that hit Germany's biogas industry since 2012, shedding light on its consequences in terms of uneven geographical development at the territorial level (see chapter 6). Changes in the legislation and subsidisation mechanisms have initially slowed down biogas accumulation pace and eventually triggered an actual devaluation (see chapter 6 and Pfeiffer and Thrän, 2018). The changed market conditions drove speculative rent-seeking strategies, leveraging cash flows from subsidies to raise funds on the capital markets, to financial difficulties and in many case bankruptcy (Lajdova et al., 2016; Hubik, 2016). A paradigmatic case is that of AC Biogas is. This large agro-energy company, which owned and operated 9 large biogas plants in the fieldwork region, evolved from being a biogas leader at the EU level to file for bankruptcy in 2014.

The story of AC biogas is exemplary of a speculative business model based on rising capitals in financial markets, immobilising them and fleeing away when rent sources go drained. AC Biogas was indeed a highly internationalised and financialised investor, achieving its pinnacle in 2011 when Alinda, a US equity fund specialised in infrastructure injected €300 million into agri.capital group SA, the parent company of AC Biogas. With this move Alinda became the owner of 75 percent of the Agri.capital SA group. While that was just the largest capital injection from non-agricultural players that agri.capital SA group seized, it was

not the first. In 2009 a group of investors led by the TWC a blue-chip[111] asset management corporation provided €60 million in new equity. All the members of the group were purely financial players specialised in asset management and equity investment and only one had a recognisable link with Germany: Deutsche Bank Securities Inc., the investment banking and securities arm of Deutsche Bank AG in the United States. The good relationships of agri.capital group SA and therefore AC Biogas with large financial players sink their roots back to its foundation. Then, the company's sole shareholder was an offshore company registered in the Cayman Islands under the name of United BioFuels Europe Cayman Holdings Ltd. This company was registered with the US Security and exchange commission as a securities issuer. Amongst its founders, there is Mr Kevin Parker, who was Global Head of Deutsche Asset Management from 2004 – 2012. As an experienced and high-level financial officer, Mr Parker connected global, mainly us capitals, with the German, highly subsidised, biofuel market.

The attitude of AC Biogas is pictured by Ulrich[112]:

> "they bought and built biogas plants, without paying the due attention to management and maintenance, just to make easy money from subsidies. They were «megalomaniac». They bought everything there was, because they didn't know where to put all the money they received from investors" (Ulrich – Farmer/DE-4, Autumn 2018)

The biogas AC case shows a mix of mobilities and immobilities within the corporate structure itself. If fixed capital immobilised in plants was devalued as consequence of plant closures or sales, mobile investors owning AC biogas shares, could mitigate their losses by either divesting timely or enacting financial edging strategies thanks to the sizes of their asset portfolio. The immediately visible effects of such dynamic to the wider territorial socioeconomic fabric is fix capital (machineries) and variable capital (jobs) destruction interpretable as signs of uneven geographical development from 'green' capitalism at work.

[111] According to the Cambridge American dictionary a blue -chip company is "considered to be a safe investment for your money because is well-established and has performed well in the past".
[112] For details about Ulrich as a participant to interviews see subsection 8.2.1.

8.3.5 The abstraction of the fieldwork region into a horizon for 'green' accumulation as *territory grabbing*

In the fieldwork region, value extraction around biogas rests on a strict relation between heavy subsidisation and cheap and concentrated land. The commodification of the latter underlies the accumulation of surplus value flowing from the former. Simple as it may appear, this mechanism triggers deep transformative processes abstracting biogas production areas and the territories wherein they are located into the built environment of 'green' capitalism. These alterations are observable at multiple levels, from the complexity of the territorial sociotechnical organisation to the immediate tangibility of landscapes. Yet, all of them revolve around the inextricable nexus between agriculture and bioenergy production. We will discuss them in what follows.

With biogas generation the socioecological relations around land, and its double function of space and agricultural soil, are reframed over a horizon of meaning stretching from food to renewable energy production. The discursive logic of such a process builds on a dialectic rationality between distinct socioecological *emergencies* and the possibility to tackle them through the *modernising efficiency* of subsidised private accumulation within the principles of neoliberal governance, with two underlying storylines. The first alleges that energy crops are a renewable and sustainable source, regardless of the specific socioecological conditions in which they are produced. As a consequence, risks posed by the monocultural methods used to farm them industrially, such as soil nutrient depletion, large-scale chemical contamination, and ILUC related emissions, may be underplayed or disregarded altogether (Emmann et al., 2013). The second implies that readjusting the sociotechnical systems organising agricultural production to renewable energy generation can be a 'win-win' game. As a consequence, different factions of the capitalist class would cooperate accumulating value and redistribute part of it to factions of the labour class and articulations of the state, while originating positive externalities for actors and organisations external to the territorially based alliance and value extraction chain.

The pervasiveness of this rationality is observable at several levels from the national down to the regional and local ones. Specifically, in the context of the fieldwork region marginality, an abstractly universalist rationality, informing ecological modernisation theories and relevant policy approaches, conjugates the emergency to mitigate the ecological crises

with the urgency to modernise the agricultural sector and, on the other hand, alleviate the divide with the richest Germany's regions.

This narrative was particularly pervasive during the biogas booming years between 2002 and 2012. *Mantras* urging a transformation 'from food farmer to energy farmer', or still defining the 'farmer as energy economist' and ' energy manager' (Breitschuh et al., 2004; Scheffer, 2005; Dänzer, 2006) were used in public and academic debates to state the necessity to *modernise* farmers' traditional role and fully integrate them within the renewable energy industry. This can be considered as the outcome of a long-term normalisation dynamic making renewable energy sources, and therefore also biogas, compatible with the relations of production of capitalism (see chapter 3). In this regard, particularly evocative are the words spoken in 2007, by Gerd Sonnleitner, who was then president of the powerful German Farmers' Association (DBV):

> "In addition to food producers and landscape managers, our farmers have long been *energy managers* [emphasis added]. According to them, their program today would be *grain power instead of nuclear power* [emphasis added]**"** (El-Sharif, 2007)

This quote exemplifies the outcome of a discursive processes re-functionalising the opposition to nuclear power, deeply rooted in the Germany's environmentalism imaginary -the context where early debates on renewable sources started (see chapter 6)- to an ecological modernisation argument. Once sanitised from its subversive potential and made compatible, it can be used to legitimise the expansion and intensification of the accumulation frontier over the 'green', and -specifically to biogas- over agriculture and agricultural soil.

As a major result, farmers in the fieldwork region changed their business models to adapt to the new role of energy crops and biogas producers, establishing simultaneously organisational path dependencies which put them in jeopardy when subsidies for biogas were cut in 2012 and a place and sector specific devaluation started. Peter who runs an agricultural company nearby Neubrandenburg in Mecklenburg-Vorpommern, pictures clearly the parabola of biogas in the fieldwork region:

> "We started with biogas in 2007, when the subsidies were very generous. Biogas seemed the right thing to do. Corn is easy to farm and with biogas

> it became more profitable. We have a 500Kw biogas facility, which needs some 200ha to be fed. In order to make as much money with cash crops we would need 1200 ha. Bioenergy is one of the few options available for farmers. When they started to cut subsidies for biogas, in 2012, farmers were left with really few options. Stockbreeding is poorly profitable also because land prices are rising. In the years of the boom, it was convenient to buy or rent land even at disproportionately high prices to produce energy-crops. This pushed up average prices, making it very difficult especially for small and young farmers to access the market or borrow money from banks" (Peter – Farmer/DE-2, Autumn 2018)

As we can read from the quote, Peter assumes a correlation between the constant rising of land prices in the fieldwork region and biogas subsidisation policies. Yet, we should notice that there is no agreement in specialised literature around the magnitude of the effect biogas subsidisation has had on land prices (Emmann et al., 2013; Appel et al., 2016). Nevertheless, this contrasts with a widespread perception emerged from interviews with farmers correlating the bioenergy and biogas sector growth to a land price surge (interviews with Farmers-1, 4, 5, Autumn 2018).

A second important element emerging from Peter's words is that bioenergy and biogas contributed to a structural change making traditional farming operations more difficult, whilst exacerbating famers' dependency on energy subsidies. This affects particularly small and young farmers, along a macro-trend characterising the agricultural sectors in the broader EU context (Borras Jr et al., 2013; Herre, 2013; van der Ploeg et al., 2015). The effect on young farmers is sharply described by Kora. She is member of a small collective running a farm in Brandenburg, 80 km north of Berlin. The land they farm belonged to her family and was collectivised in 1949. After reunification a restitution process gave Kora the land back. Kora is a radical leftist militant and sees farming not only as a way to make her and her comrades a living, but also as a path towards a radical change, opposed to industrial farming. She is also member of the German small farmers' association Arbeitsgemeinschaft bäuerliche Landwirtschaft (from now ABL). Within the ABL's youth branch she and others launched a campaign against land grabbing in Germany, under the slogan stop-land-grabbing.de[113]:

[113] The pressure towards greater concentration that prices exert is intensified by the operative framework of BVVG, the institution managing the privatisation of former DDR's land that is still owned by the state. Whereas in the first decade after reunification BVVG both sold and rented land, the orientation changed in

> "Kora: Land grabbing is happening here as it is in countries of the global South. Capitalism is here and so is land grabbing. And it is happening also because of bioenergy and biogas. I'd say, to some extent, biogas has been for Germany what palm oil is for Indonesia.
>
> Samadhi: how does the grabbing take place here?
>
> Kora: Violence can have many faces. Here does not have the face of forced expulsions, or armed occupations. Here it has the face of the 'free' market and increasing prices. The interest in east Germany's land has also meant that price have risen, so if you cannot afford to rent the land you need to keep your farm going, you're out. Whilst if you are big, not only you can afford whatever prices, but also push them even further up, by buying massively. And what is more you are entitled to the EU's Common Agricultural Policy [CAP] payments, which make you even stronger.
>
> Samadhi: would you agree if I defined that *grabbing by market*?
>
> Kora: yes, definitely" (Kora - Farmer-Activist/DE-2, Autumn 2018)

The mobilisation against land grabbing can be interpreted as a transformative effect on democratic life triggered by industrial agriculture and the extraction and accumulation of surplus value in and around biogas. This form of conflict intertwines with two further cleavages. Along the first, peasant movements, organised in international networks, such as "La via campesina", campaigning against land concentration and, by implication, for the democratisation of the EU CAP, interplay with organisations and groups opposing industrial agriculture as a cause of ecological crisis. Their struggles found a common goal in opposing the industrial farming of corn, a crop symbolising the impetuous expansion of monocultures linked to growing bioenergy and meat industries (Thrän et al., 2020). In this context the concept of *vermaisung* was coined. Focusing on it allows to better comprehend the intricate interdependencies amongst alterations impacting on both the bio-physical and

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the late 2000s (Herre, 2013; Gerke, 2018). Farmers were then pushed to buy the land they had leased until then. BVVG introduced an incentive scheme (EALG) granting farmers a first refusal right to buy at a discounted price land they had leased up to that point. The only qualifying requirement was to own less than 50 percent of the cultivated area. If we consider that by 2009 about 75 percent of BVVG's land was leased out to large farms controlling more than 500Ha and, as Herre (2013 p. 64) explains: "the scheme was not linked to the size of the farm, [the EALG] led to the absurd situation whereby a small farmer cultivating 45 ha, owning 25 ha and leasing 20 ha from BVVG was ineligible for the special purchase facility and often lost the land. At the same time, the EALG allowed large farms and investors to purchase the land at the discounted rate, thus providing them with very high subsidies".

the social spheres. The term literally means *maizification* (from maize) of the countryside and correlates transformative effects on democratic life with alterations of landscape, actually pointing to a much deeper process abstracting a territory, or places of it, into the palimpsest of 'green' accumulation in and around bioenergy. Along this multifaced system of meanings, the term *vermaisung* also signals the fracture separating agro-industry's interests from critical environmentalist movements and organisations exactly around the significance of biogas generation. As Michael Fuest, a regional representative of the Greens, explained in an interview to a local magazine in 2011:

> "we Greens wanted to develop the biogas as one of the most important sources of our new energy policies. In recent years there has been a boom in this area in our region, which has led to the *vermaisung* of our landscape, which we do not want. It reduces the biodiversity in our fields and leads to high pressure on costs for small-scale agriculture" (Müller, 2011)

The second conflict cleavage is often linked to problems created by the plants at a local scale, such as noise, traffic and odours and the related protests or resistances by the neighbouring communities. Sometimes, those struggles are connected to unbalances or injustices in the redistribution of the value extracted in and around the generation of biogas towards the communities. Campaigns for a reform of the fiscal system to ensure that a larger share of the trade tax revenue from renewable energy plants is allocated to the budgets of the federal state and local institutions with jurisdiction over the territories housing the renewable energy plants, rather than to those of the states or local institutions where the headquarters of the companies owning or operating the plants are located, have escalated into a coalition of regional and local institutions and civil society organisations. Its core tenets are explained clearly by the words of the Brandenburg's finance minister in 2014:

> "The Federal Council decision has taken an important step towards eliminating an injustice in German tax law. After all, the pollution caused by wind turbines or biogas plants is not felt at the company headquarters, but in the local community. It is therefore fair and consequential that these municipalities participate consistently and appropriately in the trade tax revenue. This amendment to the law certainly also contributes to the acceptance of plants for the generation of renewable energies.

> That cannot be underplayed. Because the energy transition can only succeed together with the local people" (Government of Brandenburg, 2014)

Having explored transformations induced by the extraction and accumulation of surplus value in and around biogas generation, we can draw some consideration on their general significance. The overarching process connecting epiphenomena as diverse as landscape and ecosystem alterations, sociotechnical systems restructuring and the rebalancing of class and factional relations, as well as the reframing of democratic life is here intended as one of *territory grabbing*, as it is defined in chapter 4. Similarly to the Italian case, its occurring indicates the progressive abstraction of the fieldwork region within the accumulation patterns of 'green' capitalism.

8.4 Conclusions

This chapter has illustrated the extraction and accumulation of surplus values in and around biogas in the eastern German states of Brandenburg and Mecklenburg-Vorpommern.

The first section after introduction has investigated the case study's socio-economic fabric from a geographical historical materialist perspective. This has allowed to frame the region's marginality within the division of labour at the national and higher levels and interpret the current conditions to access both agricultural land and the agricultural sector by reason of their substantial importance to surplus value accumulation in and around biogas generation.

The second section has explained the political economy and ecology of biogas in the fieldwork region. More precisely, it has carried out a value and class analysis by applying a range of historical materialist categories, elucidating how the region's marginality and land relations have been functional to a sustained level of accumulation in and around biogas. This has resulted from an analysis addressing three distinct levels: the territorially based alliance controlling and organising the biogas value extraction chain; the value extraction and accumulation patterns as an intersection between land relations and subsidisation policies; the transformations induced by the expansion of 'green' capitalist relations over not yet or 'inefficiently' commodified land and natures.

This chapter concludes the presentation of the empirical findings of this research. In the next one, final considerations are developed, combining the outcomes of theoretical elaboration and empirical analysis, and discussing the implications of this work to future research and beyond the academic debate.

Chapter 9 – Discussions and conclusions: renewable energy as 'green' capitalism at work

9.1 Introduction

This thesis has shown how 'green' capitalism reframes the ecological crises into new horizons for enduring accumulation. It has also analysed the effects in terms of space production, socioecological transformations, and inequalities.

The thesis has interpreted 'green' capitalism as a hegemonic project in the making, explaining how the extraction and accumulation of surplus value in and around the generation of renewable energy is a case of 'green' capitalism at work. By focusing on renewable energy production, the research has identified: the processes of enclosure and transformation triggered by 'green' capitalism; the patterns of class and factional cooperation and conflict it entails; and the governance processes with which it is associated in terms of both hegemonizing narratives and institutional structures.

These findings stem from researching two renewable energy production systems and territories located respectively in eastern Germany and southern Italy, which are both marginal regions within a central node of global capitalism, the European Union. This methodological choice was crucial in developing a geographical analysis, grounded in historical materialism, of the integration of two systems and territories within the division of labour at multiple scales. Most importantly, it allowed a better understanding of the relations between 'green' accumulation and uneven geographical development. Amongst the major contributions of this research are an original definition of 'green' capitalism and the introduction of the theoretical and analytical category of *territory grabbing*.

The three sections below elucidate the overall significance of the thesis findings. A further section follows, discussing the implications of theorising a 'green' capitalism to the wider debate around capitalism and its evolution. The final section is a post-scriptum casting a glance beyond the scope of this thesis as an academic work.

9.2 Territorialised accumulation: cooperation in a rentier regime

This research demonstrates that the extraction and accumulation of surplus value from the production of renewable energy in the studied territories implies the privatisation of ecosystem spaces, biotic services and abiotic flows, and their abstraction -that is commodification and financialization - into forms of *fictitious capital*. It follows that, in contrast with approaches based on marginalist economics, this thesis reconciles the socially necessary labour time theory of value with political ecology, contending that commodified spaces and natures do not innately provide value, but rather serve as a collateral to capture - by way of rent - portions of surplus value produced in society at a different point in time and space.

The extraction and accumulation of value is organised through *territorially based alliances* coordinating the cooperation amongst classes and class factions and redistributing value according to geographically and historically determined power balances.

This section advances a theory of territorialised value extraction and accumulation around renewable energy in marginal geographies. This is based on three elements: (i) the revenue sources of a renewable energy plant or system; (ii) the situation of a renewable energy production area and territory, relative to the division of labour at the national or higher geographical scales; and (iii) the patterns of cooperation and conflict organising, boosting, or hampering the extraction and accumulation of value.

9.2.1 A composite form of rent as a revenue source

When discussing the revenue sources of renewable energy production, we should consider, as a general condition of the market, that the average price for renewable energy production is higher than that for non-renewable energy. In other words, rarely does renewable energy production reach a *grid parity*[114]. We have observed this directly in the case studies. Neither a wind plant in southern Italy nor a biogas production system in eastern Germany would make a profit, in conditions of free competition. By elimination, the revenue that these renewable energy plants produce is a form of rent, constituted of three distinct components: rent on fixed capital paid as subsidies; ground rent; and rent on fixed

[114] See footnote 30.

capital, additional to that paid as subsidies (see chapter 3). Let us now summarise each of them.

Subsidies can be regarded as a specific form of rent on fixed capital, paid by the state on privately-owned fixed capital, used to produce renewable energy and with the legitimation of decarbonising the ecosystem. Subsidies are the most important of the three components by reason of the *enabling function* they perform. Without them no capitalist would invest in producing renewable energy, unless seeking to incur a certain loss. Indeed, with grid parity out of reach, a transition policy based on private investment can only work by financing the returns on those investments through an exogenous flow of surplus value, that is subsidies. These are raised by the state through the fiscal system and channelled to capitalists. If the owner of a renewable plant rents, or sells, the plant to a third party, subsidies contribute to determining the final price since they are a claim on future revenues from public money transfers paid for a length of time[115], known in advance and set in binding terms. When the production of renewable energy is based on energy crops, subsidies paid for renewable energy production might combine with subsidies for the agricultural sector. As we have observed with biogas generation in eastern Germany, this amplifies cost-effectiveness, therefore the magnitude of the value extracted and accumulated and the attractivity of a renewable energy source as an investment option (chapter 8).

The second component, ground rent, is the rent paid on land regardless of improvements thereon. This is determined by land locations and other characteristics specific to the energy source. If we consider our two case studies, ground rent reflects the conditions for accessing land in terms of communications routes, but also, anemometric features or soil fertility, depending on whether the energy source is wind or energy crops for biogas.

The third component is rent on fixed capital, additional to that paid as subsidies. We have seen in chapter 3 that a renewable energy plant is to be considered a built environment for renewable energy production. It is composed of instruments and infrastructures incorporated in a land plot, for the exploitation of a use value from either an abiotic flow, such as wind, or a biotic ecosystem service, such as soil fertility. Renting this “geographically ordered, complex, composite commodity” (Harvey, 2018b p. 233), following Harvey’s built

[115] Usually, subsidisation periods range from 10 to 20 years.

environment definition, earns the owner interest, reflecting a claim on the future revenues that the renter will realise by producing renewable energy through it.

9.2.2 Territorial marginality as a cost-effectiveness enhancer

The marginality of a renewable energy production area, and the territory wherein it is located, relative to the division of labour at the national or higher geographical level contributes to increasing the cost-effectiveness of a renewable energy production investment. The marginality, which is therefore functional to a sustained level of accumulation, is efficiently exploited through the organisation of a *value-extraction chain*, that is a "network of labour and production processes" (Hopkins and Wallerstein, 1986 p. 159). This may entail, as with our case studies, the relegation of a production area, and territory, to the function of *extractive enclave* through which surplus value is extracted, and from which it is to the greater extent channelled towards external capitalist centres.

We have documented that the socio-economic marginality of the Italian Apulo-Campano Apennine, and Brandenburg and Mecklenburg-Vorpommern, has played a crucial role in compressing the average ground rent or selling prices of lands yet to be converted to renewable energy production. This has served as a powerful pull factor for investors, reinforcing the enabling function played by subsidies.

9.2.3 Territorially based alliances and the excluded

The extraction and accumulation of value around renewable energy production is organised through territorially based alliances. This system of territorialised production relations regulates the cooperation, and settle the conflicts, both *between* capital and labour, and *within* these classes, amongst their factions. It also coordinates interactions with local bureaucracies and articulations of the local state which preside over permitting and control functions.

The case studies in this thesis have shown that the marginality of a renewable energy production area, and territory, favours the *dominant external* capitals within the alliance and along the value-extraction chain. The adjective 'external' designates the externality of capitals' headquarters to the production area or territory. The adjective 'dominant' indicates the capability of a player or group of players to capture the largest surplus value shares

redistributed along the chain, mainly related to its or their specialisation in processes of that chain with higher average profitability. The marginality of the production area, and territory, makes the presence of local capitals with a magnitude and productive sophistication suitable for seizing the most remunerative processes highly unlikely. The case studies have also shown that in a condition of marginality, local capitals are likely to be specialised in lower added-value or activities with lower average profitability.

Moreover, local capitals' smaller magnitude does not allow a degree of assets financialization and differentiation suitable for absorbing shocks from possible localised devaluations. Specifically, as the case study on biogas in eastern Germany shows, local and less mobile capitals, in a subaltern position, are likely to be disproportionately damaged by external shocks such as changes to subsidisation policies and volumes.

In both case studies, the acquisition of lands giving access to the targeted renewable source and the fulfilling of permitting procedures have proved to be operative areas where mediating functions are indispensable. These functions have been performed, and sold as services, by specialised agents, relying on either a techno-managerial knowledge or an embedded knowledge about the cultural codes characterising the territory and the sector. In the Italian case study, translating and mediating functions are performed by business developers with a varied degree of professionalisation. In the German case, similar functions have been fulfilled within two distinct capital factions: biogas technology expansion throughout the countryside has been fostered by professional energy service providers, whilst agricultural land conversion to energy crops has been boosted by the managers of companies pre-existing to the biogas boom.

Subordinate to the capitalist class are factions of the labour class employed in the segments of the value-extraction chain. Not only are they redistributed a fractional share of the value they contribute to produce, they also are more exposed to the damage of localised devaluations, because of their scarce mobility and their exclusion from decisions around business strategies, which in fact crucially impact on their employment stability.

Local bureaucracies and articulations of the local state are also in a subordinate position. The latter participate in value redistributions through taxation of renewable energy plants. Contrastingly, the former are normally not entitled to be allocated any value share. Yet,

they can seek to trade segments of the permitting or control procedures which they oversee in return for a bribe, as it has been observed in the case of wind energy in southern Italy.

Excluded from a territorially based alliance are inhabitants, activists, and non-inhabiting citizens which, regardless of the class to which they belong, do not participate directly to value redistribution.

9.3 Land enclosure and grabbing, from formal to real abstraction

The research shows that the process of appropriation of the lands needed to access a renewable energy source is articulated in three distinct phases. Initially lands are *formally abstracted* as an object of capital. In the second phase they are actually grabbed and enclosed. In the final phase, through a process of *territorialisation* or *real abstraction*, lands are systematised within the function that the territory wherein they are located plays in the division of labour at the national or higher levels. This implies the transformation of intermediate forms of ownership into fully capitalist ones and therefore of those lands into financial assets. In other words, the process of appropriation is also one of abstraction, whereby the spaces targeted for accumulation around renewable energy production are transformed from *lived* spaces into *abstract* spaces of capital (Lefebvre and Nicholson-Smith, 1991). From irreducibly different *qualities* they are *commodified* into comparably standardised *quantities* measured on a monetary scale.

In our case studies, the formal abstraction phase started with an intertwined process of technological experimentation and spatial exploration directly managed and funded by public institutions. Categorisation and mapping characterised these initial processes evolving with increasing precision. Once technology reached a commercial maturity and subsidisation policies were introduced, accumulation became a real opportunity, triggering an actual rush to land. This expansive phase evolved in the Italian Apulo-Campano Apennine or Brandenburg and Mecklenburg-Vorpommern through distinct patterns because of the different historical backgrounds and the specificities of each renewable energy source. Yet, it entailed in both cases the organisation of force through a combination of economic constraints deriving from market mechanisms and legal arrangements.

Starting with the Italian case, a combination of socio-economic marginality and an information asymmetry between investors and landowners facilitated land enclosure. This exquisitely market-based mechanism incorporated landowners adversely into a value-extraction chain which redistributed to them a small fraction of surplus value extracted through wind production. In 2003, landowners' bargaining power was further weakened by the introduction the decree 387/2003. Through an extensive interpretation of the 2001/77/CE European directive on the promotion of renewable energy (see chapter 6), the decree conferred on renewable plants the attribute of *public interest, urgent and non-delayable works*, and therefore entitled investors to invoke compulsory purchase and compel landowners to sell their land (see chapter 7).

The ownership regime in Brandenburg and Mecklenburg-Vorpommern is characterised by a highly concentrated land ownership regime and a historical specialisation in the cultivation of grains, also in connection with the presence of large stock breeding operations. Renewable energy subsidisation policies in general and the additional bonus that between 2004 and 2012 rewarded electricity produced through agricultural biomasses and created the opportunity to profitably devote Brandenburg and Mecklenburg-Vorpommern's large landholdings to energy crop monocultures, particularly corn. As a result, a long cycle of land acquisitions started, taking place mainly through either agricultural companies' shares acquisitions, in order to circumvent restrictions on direct land buying, or purchases of land from BVVG, the institution charged with the privatisation of DDR's public lands (see chapter 8). Similarly to the Italian case, the marginality of the Brandenburg and Mecklenburg-Vorpommern to the German capitalism played an important role in containing land prices and favouring landowners' willingness to sell their lands or participate to the value-extraction chain around biogas.

In both cases, once lands have been enclosed and transformed into the built environment of renewable energy production, they, and the territories where they are located, are stably assigned a precise function within the division of labour at the national or higher level, which amounts to saying that they are fully territorialised or abstracted as objects and spaces of 'green' accumulation.

In the process of land enclosures and subsequent territorialisation we have described, the territorial hegemony of the state plays a primary role. As David Harvey argues "the

developmental role of the State goes back a long way, keeping the territorial and capitalistic logic of power always intertwined" (2005b p. 145). This has two implications. The first is that the function that is assigned to production territories within the division of labour crystallises, at least temporarily, historically determined inequality and uneven development patterns and their decisive role in compressing investment costs and facilitating land appropriation. The second is that the lands forming part of the built environment of renewable energy production are brought under a *pure* capitalist form of ownership and as such they can be traded as financial assets (Harvey, 2018b).

9.4 Socioecological transformations and territory grabbing

This research interprets space as socially produced (see chapter 4). As a major implication, the rural lands, which for investors are merely assets for accumulation, are here regarded as fragments of a *territory*. This is a stratified socionature living *through* and *as* history; constructed as both *human* and *more-than-human*; composed of *places* and *distances*; visible as *landscapes* (for a full definition see subsection 9.4.4).

Based on these premises, this research has evidenced that the abstraction processes described above extend to the wider territory (or places of or in it), transforming it and its multi-layered geo-historical stratification. The following three subsections offer an account of the most significant transformations around landscape and biophysical processes; socioeconomic fabric and related class dynamics; territorial democracy and political subjectivation. The last subsection provides an extended definition of the category of *territory grabbing and enclosure*. This has been devised as a theoretical and analytical instrument to contribute to the understanding of such transformative processes and presented in chapter 4 in a preliminary form. It is here extended basing on the findings of the case studies.

9.4.1 Alterations to landscape and biophysical processes

Landscape is the visive manifestation of a territory, through which the abstraction of a rural territory into the built environment of industrial 'green' energy can be appreciated. The wind-turbine forests cramming the ridges of the Italian Apulo-Campano Apennine, or the planes and mounds of Brandenburg and Mecklenburg-Vorpommern tinted in the green

and dark yellow of corn cultivations, stretching as far as the eye can see, are testimonies to a new cycle of 'green' accumulation expanding over rural, and marginal, territories, and their transformation into new industrial energy districts. Although our senses catch some of these transformations, they cannot gather them in full. Some transformations elusively occur beneath the soil or in realms so microscopic that we can only grasp them through instruments or by observing their macro-effects, including contamination and diseases. Wind turbines have foundations that go as deep as three meters underground, whilst the territories' orographic heterogeneity and biodiversity is transformed by roads, electric sub-stations and all the array of infrastructures that the wind energy value extraction chain requires to function effectively. Similarly, the productivity of intensive-extensive energy-crop monocultures necessitate the use of phytochemicals to keep up with competition and market trends, and in so doing reframe the biophysical characteristics of the soil, to the point where chemical contamination and nutrients depletion have sapped its fertility and contribute to desertification.

9.4.2 Reconfiguration of the socioeconomic fabric and class dynamics

For a value extraction chain to work effectively, its several segments must be interconnected, and correspondingly the factions and actors that are part of the territorially based alliance must cooperate. This implies a transformation of the socioeconomic fabric of the territory where the chains operate.

In our two case studies, the establishment and expansion of wind energy or biogas value extraction chains generated a demand for goods and services that induced the reorganisation of territorialised sociotechnical systems, including local institutions. As a result, new businesses were created and older ones converted to seize the newly offered opportunities, while others disappeared. For their part, local institutions, started to receive fresh money through the normal functioning of the fiscal system or according to specialised agreements with the investing companies. The reorganisation and specialisation of productive cycles related to value flows from renewable energy production has been significant in both case studies in establishing sociotechnical path dependencies. Their intensity became clear when those value flows shrank. In both cases, a change in the regulatory and subsidisation framework compressed the demand for the goods and services provided by

the restructured businesses or local institutions. In the Italian case, the outlawing of the widespread practice of conditioning the issuing of building permits to the payment of royalties by investors has pushed many municipalities' budgets on the brink of insolvency. In the German case, the substantial reduction of biogas subsidies in 2012 led, as we have discussed above and diffusely in chapter 6 and 8, to a quick divestment from larger, more internationalised and financialised capitals.

9.4.3 Reframing risk and efficiency: political subjectivation and contestation

The emergence and expansion of a renewable energy value extraction chain may induce transformations in the local communities' democratic life, also prompting process of political subjectivation. In this regard, it is important to consider that, as we have argued in the course of this thesis, the legitimation rationale of renewable transition policies based on capital accumulation is underlain by a discursive dialectic between the perceived *risk* and *emergency* posed by the ecological crises and the assumed *efficiency* to tackle them through private investment. In our two case studies this has intertwined with socio-economic marginality in constructing a storyline whereby, through private investment in wind energy or biogas, territories could be modernised, and the risks posed by their marginality addressed, so alleviating low levels of per-capita income, depopulation, and unemployment.

On the other hand, the case studies have shown that such a legitimising dialectic can be reframed through processes of political subjectivation and organisation, intended to oppose or reclaim control over a territorialised renewable energy production.

In the Italian case study, a grassroot network known as "No Eolico Selvaggio" – which translates into "no to wild wind energy", where "wild" is to be interpreted as "difficult to control", expanded the concept of risk and emergency to include the urgency to defend their territory from speculation around wind energy production. Efficiency has been hence resignified as the broadening of territorial communities' democratic capability to self-determine their own paths towards sustainable development (see chapter 7). A similar process can be observed in the German case, where initial advocates of biogas turned at a later stage into critics of it, such as -amongst others- articulations of the green party at multiple levels, coining the term of *vermaisung*. The word points to the *maizification* of landscapes

by corn monocultures (see above and chapter 8) and is used to reinforce the denunciation of industrial scale biogas as a source of ecological risk and a cause of social injustice around the regime governing access to land[116].

9.4.4 Territory grabbing – a full definition

The processes observed and analysed in the two case studies of this research trigger geo-historical transformations that re-signify renewable energy production areas, territories, and regions as objects of capital and specifically as reservoirs of energy, investment assets and value extraction platforms. These transformations are here defined as *territory grabbing*.

This is a process whereby a territory, or places of or in it, is abstracted from its stratified historical identity and transposed into costs and potential revenues within the accumulation function of an investment scheme, to the benefit of factions of the capitalist class. As a result, a territory, or places of or in it, is re-signified into an object of capital, whether as a reservoir of ('green') energy, or as composite and extended instrument (fixed capital) for production, or as a space for the expansion of capital's *built environment*, for production, distribution, consumption or waste disposal. Territory grabbing implies the incorporation within capitalist production relations of a territory's use values. This process engulfs all the socioecological relations whose occurring or non-occurring is needed for, or indifferent to, accumulation to be sustained.

Territory grabbing is a process that takes place through the phases of *exploration*, *enclosure*, *extraction,* and *disposal*. Although these may follow a chronological order, clear delimitations amongst them should not be implied. They should rather be thought as overlapping and reiterating.

During the *exploration* phase the targeted use values of a territory are categorised, located and mapped. Their exchange value is therefore assessed also as a collateral for the extraction of composite forms of rent. This phase is also meant to determine the social and legal conditions to access the targeted use values and their impact on investment costs. As a

[116] Rudolph and Kirkegaard (2019 p. 642) analyse the siting of wind farms in rural Denmark through the category of mobilisation of "territorial stigma". They document how that is "used to legitimise the purchase and demolition of properties in marginalised rural areas".

result, strategies for enclosing the targeted use values are devised and planned, to be implemented in the next phase.

The *enclosure* phase is intended to secure a stable and full access to the targeted use values. This takes place through territorialisation practices which entail the use of force and result in the privatisation of territory's lands and places through which the targeted use values can be accessed. This entails the dispossession of individuals, groups or organisations previously controlling those lands and spaces and possibly using the targeted use values. Dispossessions may be accompanied by practices of expulsion or assimilation. Such force or violence is exerted through *physical coercion or threatening*, *legal enforcement* or *adverse market incorporations* (Hickey and Du Toit, 2013). Such force may entail the legalisation of dispossession practices as well as without formal property titling.

The *extraction* phase starts with the implementation of the investment scheme. It is characterised by the full establishment of a *value-extraction chain*, which unequally allocates the extracted value to the actors, classes and factions of *territorially based alliances* depending on the power relations amongst them. When a low or null level of integration and a scarce or null quantity of value is redistributed to local capitals, factions of the labour class or local institutions, the investment scheme, or the system of investments, can be defined as an *extractive enclave*.

The *disposal* phase starts in parallel with the enclosure phase but extends beyond the end of the extraction phase. During the disposal phase, by-products of enclosure and extraction transform the socioecological relations of a territory. These alterations impact ecosystem bio-physical processes, including those internal to the bodies of a territory's human and non-human inhabitants, through pollution and disease. Other alterations transform the cultural codes, strengthening or weakening territorial communities' sense of belonging and care, or result in the restructuring of territorial communities' democratic life.

Territory grabbing is justified by hegemonic narratives leveraging *efficiency*, as a need arising from perceived risk and emergency connotated in economic, administrative, and environmental terms. As a result, a territory's space is reframed as 'idle' or 'inefficiently' used and its ecosystem flows and stocks are re-signified as *global resources* beyond the control

of territorial communities, both in need of a *technical* and *efficient* reorganisation according to the principles of private accumulation and neo-liberal governance.

Especially in the case of hegemonic narratives around 'greening' processes, a territory is entrusted with a *world-saving mission*. This rationale may be used to deliberately misrepresent criticisms from opposition and resistance movements that denounce the extractive or speculative character of an investment scheme, casting them as *antimodern, NIMBY*[117] or *anti-ecological*.

Processes of territory grabbing often trigger processes of political subjectivation, or strengthen existing ones, whereby territorial communities mobilise to stop an investment project or obtain its restructuring.

9.5 Renewable energy generation: 'green' capitalism at work

In this section we will develop some consideration on the systemic relation between inequality, uneven development and 'green' accumulation as it has been observed in the production of renewable energy in the two case studies of this research. Towards this purpose, the section is divided into three subsections. The first illustrates how inequalities are implied and propagated in the extraction of value around renewable energy production. The second subsection shows how inequality in the sphere of production and extraction combines with equality and 'sustainability by definition' in the sphere of distribution and exchange. The last subsection explains how the patterns of inequalities discussed in the previous subsections serve as spatiotemporal and socioecological fixes sustaining capital accumulation.

9.5.1 Structural inequalities as an accumulation condition

This research shows that 'green' capitalism as it has been observed in the production of renewable energy in the two case studies is a rentier regime based on a composite rent. As we have seen this includes subsidies, here defined as a form of rent on capital; rent on capital additional to that paid as subsidies; and ground rent. Each of those components are

[117] For a definition of NIMBY see footnote 73.

the expression of the production relations of capitalism and as such embody the basic inequality inherent to the wage relation (see chapter 3).

Differently from rent on fixed capital additional to that paid as subsidies, the other two forms of rent also conceal inequalities arising from their relation to the production of a 'green' commodity, that is 'green' energy.

Let us start with subsidies. They incorporate and propagate the inequality inherent to the fiscal mechanism through which they are financed. Both in Italy and Germany, this is based on a surcharge levied in the electric bill, from which, however, large, energy-intensive and therefore heavy-emitting industries, are fully or partially exempted, with the justification of protecting their strategic competitivity. It follows that a heavier relative cost for the renewable transition is paid by taxpayer categories which emit significantly smaller amounts of GHG, such as households and smaller businesses. Second, in both Italy and Germany the surcharge rate calculation is loosely pegged to taxpayers' income. It follows that lower income taxpayers pay for the renewable transition comparatively more than higher-income ones, although the former are likely to consume less and therefore contribute less to overall emissions.

Ground rent paid to access a renewable energy source through a portion of space conceals a number of inequalities at multiple levels. The first concerns all members of subaltern classes. Since, renewable energy sources, such as wind kinesis, solar radiation, soil fertility or earth's heat can in principle be considered *res communes*, according to property theory and the Roman Law (McCarthy, 2015), regulating access to them through a private ownership regime presupposes an arbitrary and forcibly act of enclosure, privileging few grabbers to the detriments of a vast majority of *excluded*, or *deprived.*

The second concerns the individuals, groups or organisations previously owning the lands later converted to renewable energy production. Their privatisation, as observed in our two case studies, has taken place through a combination of price mechanisms and legal arrangements which mutually reinforced with the historically stratified inequality patterns manifested as socio-economic marginality of both the production territories. In both Italy and Germany these patterns have proved structurally important in (i) sustaining value extraction and accumulation around renewable energy production since they have lowered

investment costs (further compressed by targeted regulations), and (ii) easing previous owners' potential and actual resistance to land appropriation.

The latter inequality concerns all members of the territorial communities housing renewable energy plants. In both case studies, the fiscal system channels the bulk of taxes paid by plant owners and operators away from production territories towards central state articulations, excluding inhabitants to a significant extent from indirect value redistributions in the form of public spending by local state (see chapter 7 and 8).

9.5.2 Concealing inequalities through 'sustainability by definition'

The inequalities discussed above are all confined to the sphere of production. Once an ecosystem abiotic flow or biotic service is converted into a 'green' energy commodity - once a quality is converted into a quantity and traded on the market - all the social relations that substantiate it are hidden behind a price tag. As short clarificatory digression, we can use David Harvey's explanation of the "act of exchange" which

> "[…] tells us nothing about the conditions of labour of the producers […] and keeps us in a state of ignorance concerning our social relations as these are mediated by the market system. We respond solely to the prices of quantities of use values (2018b p. 17)"

This phenomenon - known as the *fetishism of commodities* (Marx, 1976) and extensively debated in the historical materialism tradition - also implies that the sphere of exchange is dominated by *equality*, that is to say the equivalence of exchange values between what is bought and what is paid for it. Equality in the sphere of exchange pairs and conceals inequality in the sphere of production. In the trading of 'green' commodities and therefore 'green' energy the concealing of underlaying social relations takes a nuanced significance. This is the consequence of the *conflation* in the narratives around the 'greening' of an energy source *renewability* with its *sustainability*, assuming that a renewable energy source is 'sustainable by definition'. The fact that a renewable source is sustainable in the abstract does not prevent it from becoming unsustainable, when articulated in the geo-historical reality of a production, distribution and disposal system. The case studies have shown that the framing of renewable energy production as a value extraction device can cause ecological unsustainability, as it is exemplified by the environmental hazards caused by the

industrialisation of biogas generation and the required energy-crop monocultures in Brandenburg and Mecklenburg-Vorpommern. Along similar lines, a renewable energy production system can become socially unsustainable because of the enclosure logic underlying it, and result, amongst others, into a weak inclusiveness - democracy - of planning and permitting procedures regulating renewable energy generation, as it emerges clearly from the case study in the Italian Apulo-Campano Apennine.

A potential implication of framing as necessary and inseparable the nexus between the renewable energy transition and private accumulation is the risk that the dissatisfaction for the injustices engendered by capitalist socioecological relations may spill over into renewable energy and the mitigation of ecological crises as such. Concerning signs of this have been documented by Dechézelles and Scotti (2021), with their study comparing cases in France and Italy of cooperation between grassroots networks contesting renewable energy expansion in the countryside and anti-establishment -most often far-right- parties. By applying the category of *energy populism*, they show that "there is an opportunity for populist organizations to invest in this kind of protest". Especially in France local grassroots organisations demands for more democratic and inclusive siting and planning procedures are leveraged by national far-right parties for electoral consensus, through a narrative combining climate denial and opposing to the "globalist ecology" of the elites against a nationalist ecology of 'the people' based on western and Christian values (ibidem p. 21).

9.5.3 A hegemonic project in the making: uneven development and 'green' capitalism

In chapter 3 we have argued that capitalism as a mode of production produces inequality and uneven development as a result of its inner tendency towards overaccumulation, devaluation and crises. Uneven development as it is visible in the social, ecological and geographical realms is the corollary of continuously operating spatiotemporal and socioecological *fixes*, which sustain enduring accumulation. In this regard, 'green' capitalism is no different at all from 'carboniferous' capitalism. Rather, as we have discussed in chapter 3, it itself can be interpreted as the ultimate result of the interplaying between spatiotemporal and socioecological fixes.

By the same token, the class inequalities we have identified in the two case studies of this research and discussed above, including their legitimation and concealing in the sphere of exchange, are necessary for a sustained accumulation around the production of renewable energy. On the one hand, the funding of renewable energy subsidies through an unequal system protects 'fossil' and most emitting capitalist factions'[118] accumulation patterns from taxation (see chapter 3). On the other hand, the marginality of the case studies regions and territories compresses costs and facilitates the enclosure of ecosystem flows and spaces (lands), so boosting accumulation for 'greener' capitalist factions.

This can be read as a spatial fix for a number of reasons. First, by means of large scale and long-term subsidisation Italy and Germany's state have fixed overabundant capital in space, as renewable plants and infrastructures, and time, over their lifecycle as investments. Through this coordinating action, the accumulation frontier has been moved forward, towards uncommodified or partially commodified natures, such as wind kinesis or agricultural soil fertility for energy crop production, and geographies, such as the marginal areas and territories of the two case studies. Finally, as McCarthy suggest (2015), this massive allocation of capital in renewable energy production may also contribute to a localised devaluation of the fixed capital used for fossil energy production, reducing the overall level of overaccumulation and staving off a generalised devaluation, that is to say a systemic crisis.

In both case studies, the renewable energy systems show the characteristics of a socioecological fix, as Ekers and Prudham (2017; 2018) and McCarthy (2015) have defined it (see also chapter 3). Both systems contribute to decreasing the overall level of GHG emissions of Italy and Germany, therefore the EU and the World. In so doing, they mitigate the effects of an O'Connor-like second contradiction (O'Connor, 1988), whereby capital accumulation inevitably erodes its own reproduction conditions, including the ecosystem ones (see chapter 2 and 3). Furthermore, the very fact that GHG emissions decrease, and the O'Connor second contradiction is mitigated, would provide a powerful legitimation to capital accumulation, which could be asserted as the proved solution to the ecological crises (McCarthy, 2015).

[118] For a definition of 'fossil' capital factions see chapter 3 and Malm (2016).

While these considerations have been developed around wind energy in southern Italy and biogas in eastern Germany, they can be extended to the overall renewable energy transitions in the two countries and provide analytical insights to the analysis of transitions in other countries or at different geopolitical scales. Seminal in this regard are two articles by of McCarthy (2015) and McCarthy and Thatcher (2019), investigating processes of territorialisation in and around renewable energy production, through the category of socioecological fix. The articles provide a consistent evidence base illustrating the efforts by international organisations at the highest level, such as the World Bank and UNEP, to encourage and help countries, especially in the global south, to map their renewable energy potential in terms of space and resources.

We can conclude that 'green' capitalism as it has been observed in the two case studies of this research can be defined as a hegemonic project in the making. In Gramscian terms, it can strengthen the organic cohesion between the productive structures and the political, cultural and ideological superstructures (Gramsci, 1975).

In this respect, we should consider that both case studies have shown an interpenetration of the renewable energy industry in the accumulation patterns of the respective national and EU's division of labour. This is particularly visible in the energy sector where large utilities, traditionally specialised in fossil energy production, have developed new operations devoted to renewable energy, seizing the opportunities created by national renewable transition policies and the EU's drive to liberalise energy markets. As a result, the European energy market concentration has strengthened, coming to be dominated by a small number of utilities, which through an intensification of cross-border operations have formed a deeply integrated energetic complex controlling both fossil and renewable energy generation (see chapter 6 and Pollitt, 2019). This interpenetration between 'fossil' and 'green' capitalist factions could signal the actual consolidation of an organic hegemony, ensured by, under other conditions, the re-functionalisation and legitimation mechanisms that have been discussed above.

9.6 Final considerations and future directions

The first and most evident lesson is that environmental and climate justice are inseparable from a broader and radical social justice. Isolating the ecological rationality from other

rationalities for social change and embedding it within the socioecological relations of capitalism reproduces and indeed extends the patterns of inequalities and injustice that are consubstantial to this mode of production.

Trivially enough, we need renewables. Yet - and this is the second lesson - we do not need speculation on renewables. The cases of wind energy in the southern Italian Apennine and agricultural biogas in Brandenburg and Mecklenburg-Vorpommern show that the production of renewable energy within the paradigm of perpetual private accumulation transforms it into an extraction and accumulation device, prone to become unsustainable in social or ecological terms.

Seen from this perspective, it should be no surprise that territories where renewable energy is produced become mere investment platforms or collaterals through which to grab surplus value, by abstracting space and nature into financial assets and seizing public funds from subsidisation policies.

If there exists a collective interest to 'save our house from fire' and destruction, then a fire extinguisher as vital as renewable energy sources should be defended from being distorted, depowered, and ultimately delegitimised by the *irrationality* of capitalism. As a mode of production pivoting on the ontological prominence of dominant classes' interests, and of dominant factions and groups amongst them, capitalism continuously engenders inequalities, being constitutively unfit to protect and promote collective priorities, other than class greed.

Removing renewable energy transitions from the extractive logic of capital accumulation implies that their ownership regime and governance systems, particularly in the field of energy production and distribution, should be *grabbed back* and put under forms of public and democratic control. The word *public*, here, implies a combination of statal, cooperative and collective forms of ownership. Correlatedly, the word *democratic* points to mechanisms guaranteeing an equal distribution of the power to influence the governance systems as well as the distribution of the relevant burdens and benefits, amongst classes, races, and genders.

Although the full operativity of models working through those principles at a regional, national, or supranational scale is nothing but a theoretical exercise, existing processes

restoring local public ownership for the management and delivery of public services provide the most advanced, yet contradictory and fragmented, example of how those models could be organised. A recent report published by TNI (Kishimoto et al., 2020) has documented 1,408 cases of *remunicipalisation* of assets previously under private ownership between 2000 and 2018. While these cases are concentrated mainly in western Europe and to a minor extent in other contexts such as countries of north and south Americas, as Cumbers and Paul explain, they represent "both a broader systemic pushback against privatisation, but also an uncertain conjunctural political moment where many pathways are possible as the neoliberal terrain shifts" (2021 p. 21). As they originate from the capability of local coalitions, reuniting progressive movements and networks, to steer the political agenda by exploiting spaces for manoeuvre available within "local political-economic trajectories" (ibidem) and institutional frameworks, they also provide insights to the debate on the *global commons*. Specifically, they speak to the theorists of the absolute *autonomy* of civil society and the related *necessity* to construct the global commons *against* and *beyond* the state (amongst others Holloway, 2005; Hardt and Negri, 2009), rather suggesting that, as Cumbers signals, "the engagement with reconstituted forms of state ownership" (2015 p. 74) may be necessary to expand projects intended to revert the privatisation trend. Specifically, a dialectical relation with the state may advance those projects by combining a Gramscian *war of position* with more open forms of social conflict, so producing counter-hegemonies simultaneously within the civil and political society (Gramsci, 1975; see also chapter 1), and therefore realising them also *through* the state. Along these lines of reasoning, Routledge and others maintain that while the building of "another state is not only *possible* but *necessary* [emphasis in the original]" it also is "insufficient" (2018 p. 80). Interpreting such *insufficiency* from a historical materialist perspective, we should notice that the state is the site where the struggle amongst classes is reified into laws and institutions through which the dominant classes govern society. Therefore, transformative projects *in* and *through* the state are *insufficient* when merely relating to the state (political society) within its administrative mechanisms but without seeking to *rebalance* the underlaying class relations by acting in the civil society (Gramsci, 1975 and see also chapter 1). This poses, on the other hand, a question of scale. If actions in civil society can translate into transformations in the political society, also the reverse is true. Processes restoring public ownership at the local level are subject to the administrative hierarchies of the

nation state. In other words, change brought within the local state might be easily undone or prevented by subnational, national or supranational state articulations. From this perspective, attempts aimed at *building another state* locally may prove *insufficient* if not framed within broader projects for change with a national and supranational scope. Long and uncertain as such a trajectory may appear, it makes a capillary reorganisation of subaltern classes in order to mediate their often conflicting and contradictory demands and needs indispensable. This should happen through forms of mass organisations capable of coordinating and projecting the militant particularism of spatially and socially dispersed struggles at the scales of either the nation state or higher-level political formations.

In a context of this sort, it is possible to envisage a horizon where burdens and benefits involved in renewable energy transitions and the power to deliberate about them are distributed across both communities of use and communities of place, as involved at any stage of energy production, distribution and consumption patterns.

Inescapably, this would entail the framing of renewable transitions not in mere technocratic terms, but rather as genuinely social, political and cultural processes which can be steered towards the construction of an *energy democracy* (Burke and Stephens, 2018). In the last decade, such a concept has catalysed an international social movement, interpreting it as a collective effort "advancing renewable energy transitions by resisting the dominant energy agenda while reclaiming and democratically restructuring energy regimes" (Stephens et al., 2013 p. 43).

Seen from this thesis's perspective, a historical materialist analysis can contribute substantially to the actual building of an energy democracy. On the one hand, renewable energy sources can be conceived as *commons* increasingly enclosed within capitalism's social relations through its 'green' restructuring. On the other, the operationalisation of energy democracy principles presupposes a thorough and consistent class analysis, so as to rest any action for energy de-commodification and democratisation on a rational and just basis.

With these premises, this thesis points to two future directions. The first aims at broadening the comprehension of 'green' capitalism as a regime of accumulation. Future studies applying the categories of historical materialism to (i) different productive and geographical contexts for renewable energy generation, (ii) other sectors of 'green' capitalism, and

(iii) ‘green’ capitalism spheres different than production, such as distribution, financing and disposal will be crucial.

The second looks at better understanding the role that an engagement with nation state structures may play in scaling up the democratisation of energy regimes, from existing locally based practices and experiments to the subnational, national and supranational levels.

After all, if the ‘green new deal’ is increasingly purported by world leaders as a new growth strategy, only on environmental and climate -that is social- justice can a subalterns’ class consciousness be rebuilt and the egalitarian, sustainable and inclusive society of tomorrow be imagined.

Appendix A – Questions for semi-structured interviews with project stake holders.

Below are presented the questions prepared for interviews with project stakeholders as they were devised after the first round of interviews with experts (see chapter 1). They should be regarded as indicative as they were adapted iteratively in the course of interviews.

Policy makers

- **Introductory questions.** Have you participated in any of the project phases, from approval to enforcement, of your country's legislation on renewable energy? If so, what role did you take in it?
- **Questions about the perceptions of renewable energies.** Do you think climate change is real? Do you think it is a problem everyone should contribute to mitigate? What do you think about diverting agriculture or forest land use to renewable energy production? Do you think investing in renewable energy projects is a good strategy to make money? Do you think local populations benefit from renewable projects and how?
- **Questions about specific projects.** How would you define the plant? Have you ever visited it?
- **Questions about regulations and incentives.** Do you think a legislation that sets market mechanisms to promote renewable energy development is an effective instrument to mitigate climate change? Do you think a legislation promoting renewable energies can have perverted effects such as speculative behaviours or land grabbing and concentration? Do you think it is fair to use legal instruments to force landowners or users to give their land for renewable energy production?
- **Questions about relations with local populations and civil society organisations.** Has the any difficulty arisen in seizing the land needed to develop the project/s? Has the project/s encountered any resistance from owners/users/local authorities/civil society organisations? Would you define the resistance as a NIMBY[119] behaviour? How do you think the project/s can compensate owners/users/local

[119] For a definition of NIMBY see footnote 73.

populations for the loss of land? Is any compensatory scheme in place? Do you think the project/s brings any benefit for the local community or it just contributes to general climate change mitigation?

- **Questions about territorial transformations.** Do you think the political organisation of an area or territory can be changed by investment in renewable energy? Has your cooperation network with a territory or area where a strong investment in renewable energy exists been expanded or reduced as a consequence of such investment growth?

Local authorities

- **Introductory questions:** Do you live nearby the plant? Is it visible from where you live? Have you taken any role as a public authority in the planning and realisation of the project/s?
- **Questions about the perceptions of renewable energies.** Do you think climate change is real? Do you think it is a problem everyone should contribute to mitigate? What do you think about diverting agriculture or forest land to renewable energy production? Do you think it would be fair to use legal instruments to force landowners or users to give their land up for renewable energy production? Do you think investing in renewable energy projects is a good strategy to make money? Do you think local populations benefit from renewable projects and how?
- **Question about the project/s.** How would you define the plant/s? What role have you played as an administrative authority in the project/s planning and realisation? Do you think local the project/s is beneficial or rather detrimental for local community or a specific group of it? (If the project/s is deemed beneficial) In case the project/s was opposed by landowners/users, would you use any legal mean to seize control of the land? (if project/s should turn out to be illegally permitted/detrimental to local community interests) Would you support opposition/resistance claims?
- **Question about regulations and incentives.** Do you think the incentive scheme used to realise the project/s is suitable for promoting renewable energies? Do you think it may cause perverted effects such as speculative behaviour? Do you think

the regulatory framework promoting renewable energy fulfils the most national or local goals, public or private interest?

- **Questions about class and factional cooperation.** What are the professionals that are specialised in developing the contacts with public authorities? Are they from locals? How do you think local enterprises are included in renewable energy investments? And local workers?
- **Questions about territorial transformations.** Has this area or territory been changed by the expansion of renewable energy plants? If so in what terms? How do you think these changes are compatible with the socioeconomic fabric of the area? Has the administration you work for or preside over signed any kind of compensation agreement with renewable energy investors?

Investors

- **Introductory questions:** What sector is your company specialised in? What function do you fulfil within the company? What role did you take in project planning and realisation phases?
- **Questions about the perceptions of renewable energies.** Do you think climate change is real? Do you think it is a problem everyone should contribute to mitigate? Do you think investing in renewable energy projects is a good strategy to make money? A company investing in renewable energy projects, should seek profit as such or rather accept lower returns for higher environmental efficiency? Is climate change more a problem or a profit opportunity?
- **Questions about the project/s.** How would you define the plant/s? Have you found any resistance in seizing the land needed to develop the project/s? Have authorities been cooperative in authorisation procedures? Is the energy produced sold to the national grid or is it exported to other countries? Does the grid need to be enhanced to transport the energy produced?
- **Questions about investment profitability and incentives.** Does the project benefit of any public-funded incentive scheme? If so, how important is the scheme for the viability of the investment? Where are largest returns coming from, energy market or incentive scheme?

- **Questions about class and factional cooperation.** What are the professionals and from what sectors with whom you cooperate the most when planning/building/operating a plant? Do the people you hire to planning/building/operating a plant come from the areas or territory where the plant is located? What kind of contracts do you mainly use to hire people employed in planning/building/operating a plant?
- **Question about relations with local populations and civil society organisations.** Has the project/s encountered any from difficulty in seizing the land needed to develop the project/s? Has the project/s encountered any resistance from owners/users/local authorities/civil society organisations? Would you define the resistance as a NIMBY[120] 'syndrome'? How do you think the project/s can compensate owners/users/local populations for the loss of land? Is any compensatory scheme in place? Do you think the project/s brings any benefit for the local community or it just contributes to general climate change mitigation?
- **Question about land enclosure.** Have you been able to rent or sell the land needed for the project easily? Have landowners resisted or contested the acquisition? Have you used any legal procedure to facilitate the acquisition process?
- **Questions about territorial transformations.** Has the area or territory where you invested been changed by the expansion of renewable energy plants? If so in what terms? How do you think these changes are compatible with the socioeconomic fabric of the area? Has the company you work for or run signed any kind of compensation agreement with local authorities presiding over the area of investment?

<u>Previous users/owners</u>

- **Introductory questions:** Do you live nearby the plant? Is it visible from where you live? What activity were you carrying out on that land? Are your current activities somehow related to the plant?
- **Questions about the perceptions of renewable energies.** Do you think climate change is real? Do you think it is a problem everyone should contribute to mitigate? Does the land you used/owned is contributing to mitigate climate change? Do you think investing in renewable energy projects is a good strategy to make money?

[120] For a definition of NIMBY see footnote 73

- **Questions about the project/s.** How would you define the plant? Is there any specific name different from wind farm/solar park you call it? Have investors bought the land or rented it out? Were you forced to sell/rent out the land by the law? Have you been forced by violence to sell/rent out the land? Have you ever felt in danger if you were not to sell/rent the land out?
- **Questions about incorporation and incentives.** Are you participating in the investment? And how? If so, have you developed the wind farm/solar park yourself to sell electricity to a company? Have you borrowed funds from banks? Are you getting a fair return compared to what you have earned before? Was participating in the investment the only possible option in order to make your land profitable/earn an (extra) income? Are you receiving public incentives to run the investment? Was incentives amount reduced since the initial phase? If the amount of incentives paid at investment launch was the same as the current, would you still divert your land to energy production/borrow money to develop the project/s?
- **Question about land enclosure.** Have you sold or rented your land willingly? (If there are legal arrangements forcing landowners to sell), have you felt to receive an injustice when being legally forced to sell or rent your land?
- **Questions about class and factional cooperation.** what are the types of professionals that have contacted you to negotiate the selling or renting of the land? Are you part of any organisation lobbying to protect users/owners' interests? If so, what role do you take in the organisation? What are the aims of the organisations? Is the organisation in a broader network linking it to other entities? At what scale? Is the organisation liaising with other civil society/environmentalist organisations?
- **Questions about territorial transformations.** Has the area or territory where you invested been changed by the expansion of renewable energy plants? If so in what terms? How do you think these changes are compatible with the socioeconomic fabric of the area?

<u>Project area inhabitants</u>

- **Introductory questions:** Do you live nearby the plant? Is it visible from where you live? How were your activities related to that land? Are your current activities somehow related to the plant?

- **Questions about the perceptions of renewable energies.** Do you think climate change is real? Do you think it is a problem everyone should contribute to mitigate? Do you think your community is contributing to mitigate climate change through the land it is providing to develop the project/s? Do you think investing in renewable energy projects is a good strategy to make money?
- **Questions about the project/s.** How would you define the plant? Is there any specific name different from wind farm/solar park you call it? Has the project affected your everyday life in terms of landscape disruption, increased pollution, and road network reorganisation? Was the land devoted to the project/s public? If so, has the project/s hampered your ability to benefit from it? Is the project/s beneficial or detrimental for the community? Do you think your community contributes to someone else's profits? What would it change if the energy produced by the plant were consumed by your community?
- **Question about public incentives.** Do you think it is fair that the project/s is financed through taxpayer money? Do you think public incentives may have perverted effects and prompt speculative behaviours?
- **Questions about lobbying and/or resistance.** Is any organisation lobbying to protect community members' interests in place? Is any organisation opposing the project/s in place? Are you part of this? If so, what role do you take in the organisation? What are the aims of the organisations? Is the organisation in a broader network linking it to other entities? At what scale? Is the organisation liaising with other civil society/environmentalist organisations?
- **Questions about territorial transformations.** Has the area or territory where you invested been changed by the expansion of renewable energy plants? If so in what terms? How do you think these changes are compatible with the socioeconomic fabric of the area?

<u>Civil society organisations</u>

- **Introductory questions:** Do you live nearby the plant? At what scale does your organisation operate? What is your organisation's mission? How is it related to the project? What role do you take in the organisation?

- **Questions about the perceptions of renewable energies.** Do you think climate change is real? Do you think it is a problem everyone should contribute to mitigate? How do you think people should contribute to mitigate climate change? Do you think the shift towards energy production from renewable sources is only about climate change mitigation or it is driven by other reasons? Do you think artificialisation of land large areas is a fair price for expanding renewable energy production? Do you think investing in renewable energy projects is a good strategy to make money? How do you think the word "capitalism" fit into the renewable energy debate?
- **Questions about the project/s.** How would you define the plant? Is there any specific name different from wind farm/solar park you call it? Has the project/s affected your local community's life in terms of landscape disruption, increased pollution, and road network reorganisation? Has the project/s entailed land appropriation/ dispossession and or people displacement? It is correct to define the project/s as a case of 'green' grabbing? Is the project/s beneficial or detrimental for the community in terms of quality of life/substantive democracy/exposure to pollution? Do you think better alternatives are possible in terms of climate change mitigation and people right to determine the future of the territory they inhabit/land they use?
- **Question about public incentives.** Do you think it is fair that the project/s is financed through taxpayer money? Do you think public incentives may have perverted effects and prompt speculative behaviours? Do you think public incentives have any relation with land grabbing for renewable energies, land concentration and land artificialisation? Do you think market mechanisms are apt to tackle environmental issues or rather prompt profit-making strategies leveraging environmental arguments to boost business?
- **Questions about organisation and networking.** How would you define your organisation? What is the organisation aim about the project/s: to change it or to stop it? What strategies has the organisation enacted? Are the organisation's aims and strategies framed into broader worldviews? Is the organisation cooperating with other entities addressing different but relevant social issues? At what scale?

- **Questions about class and factional cooperation.** Is your organisation cooperating with businesses investing in renewable energy projects? Is your organisation cooperating with local authorities competent for areas or territories where renewable energy projects are being developed? Is your organisation cooperating with other groups contesting the expansion of renewable energy projects in an area?

Appendix B – Modelling of two wind energy generation projects in Italy

This appendix illustrates the methodology used to model the two wind energy projects presented in chapter 7, defined as WP1 and WP2.

In light of technological change and policy provisions, project lifecycle was estimated in 15 years for WP1 and 20 years for WP2.

In accordance with relevant Italian regulations, such as the Dlgs 79/99, the law n. 244/2007 and dlgs n. 28/2011, WP1 subsidisation cash flow was estimated as REC=RF-EAV, where BF is a basic rate amounting to €180 each MWh the producer injects into the grid and EAV is the annual average value of energy, as determined by the Regulation Authority (ARERA). The amount was calculated for every year between 2008 and 2019, applying a reduction of 22 percent to RF, as per relevant regulation, such as dlgs n. 28/2011. To determine the gross profit RECs prices was summed to market wholesale price of energy, calculated as a yearly national average.

The cost structure was calculated basing on capital expenditure (CAPEX) and operational expenditure (OPEX), the first including all cost implied to achieve project commercial phase and the second consisting of all 0&M costs. Their total amount was distributed throughout the project lifecycle as Levelized Cost of Energy (LCOE), identifying how much is the monetary value needed to produce a unity of electricity (MWh). In order to obtain a comprehensive cost category LCOE was summed to property tax imposed on wind energy plants. Finally, actors positioning along the value chain was assessed as the individual revenue they manage to capture, which corresponds to the cost that is originated by the function they perform.

The same method was applied to the study of WP2, taking into account the changes provided by DM 2016 as for subsidisation cash flow. In this case, the incentive value (I) was determined through the following I=BR-AP, where AR is the hourly price depending on the moment and area energy is withdrawn. The mechanism being that of a bearish bid auction, BR must be reduced by the cut declared by the bidder, which in WP2 project case is a 40 percent reduction.

The positioning of actors along the value chain was analysed by building on the classification proposed by NERL (2016). Specifically, the latter offers a lists cost component used to assess LCOE.

In order incorporate the information gathered from interview and the study of relevant regulatory framework, integrated NRLS's classification was integrated with additional categories. One is land 'land rental' and is intended to give account of landowners' role and, most importantly, of the negotiating process entailed by land control seizing. To this purpose, 'land rental' has been unpacked into three sub-categories, such as land rental cost for each turbine, and middlemen's profit share. Since negotiating processes often involve more than one middleman with different role and importance and, therefore, capturing different revenue shares. Since middlemen appear to be able to earn about 20 percent of land rental contract value, in light of dynamics highlighted in WP1 project study, identified a share of 15 and 5 percent for respectively middleman A and middleman b was assumed (see chapter 7).

The profit share conveyed to the territory and national population through taxation was also considered. To this purpose, I only considered property tax excluding income taxes. This is so, because property tax is the only and most important source of income for councils, since a major share of it is directly channelled into the budgets of councils, being therefore the most important top-down redistributive mechanism in place.

References

Abbagnano, N. 2003. *Storia della filosofia Vol. 3*. UTET.

Acosta, A. 2013. Extractivism and neo extractivism: two sides of the same curse. *Beyond Development: Alternative Visions from Latin America*.,pp.61–86.

Agamben, G. 2005. *State of exception*. Duke University Press.

Agnew, J. 1994. The territorial trap: the geographical assumptions of international relations theory. *Review of international political economy*. **1**(1),pp.53–80.

Aha, B. and Ayitey, J.Z. 2017. Biofuels and the hazards of land grabbing: Tenure (in)security and indigenous farmers' investment decisions in Ghana. *Land Use Policy*.

Amato, L. 2019. «Ho preso tangenti sulle pale eoliche», la confessione del funzionario. *il Quotidiano del Sud*. [Online]. Available from: https://www.quotidianodelsud.it/basilicata/potenza/cronache/giudiziaria/2019/11/20/ho-preso-tangenti-sulle-pale-eoliche-la-confessione-del-funzionario/.

Amendola, M.L. 2018. Dalle 19.34 del 23 novembre di 38 anni fa. *A SUD*.

Ammannati, L. 2011. L'incertezza del diritto. A proposito della politica per le energie rinnovabili. *Rivista quadrimestrale di diritto dell'ambiente*. (3).

De Angelis, M. 2001. Marx and primitive accumulation: the continuous character of capital's enclosures. *The Commoner*. **2**,pp.1–22.

Angelo, M.J. and Du Plessis, A. 2017. *Research handbook on climate change and agricultural law*.

Angus, I. 2008. The Myth of the Tragedy of the Commons. *Monthly Review*.,pp.1–11.

Antonicelli, N.L. 2017. La nuova procedura di VIA. La procedura di VIA prima e dopo il D.Lgs. 104/2017: il caso studio della Cementeria di Colleferro in Roma. *EIA; environmental policy*.

Appel, F., Ostermeyer-Wiethaup, A. and Balmann, A. 2016. Effects of the German Renewable Energy Act on structural change in agriculture – The case of biogas. *Utilities Policy*. [Online]. **41**,pp.172–182. Available from:

http://dx.doi.org/10.1016/j.jup.2016.02.013.

Argenti, N. and Knight, D.M. 2015. Sun, wind, and the rebirth of extractive economies: Renewable energy investment and metanarratives of crisis in Greece. *Journal of the Royal Anthropological Institute*. **21**(4),pp.781–802.

Armiero, M. and Barca, S. 2004. *Storia dell'ambiente: una introduzione*. Roma: Carocci Editore.

Armiero, M., Gravagno, F., Pappalardo, G. and Ferrara, A.D. 2019. The Nature of Mafia: An Environmental History of the Simeto River Basin, Sicily. *Environment and History*.

Azzarà, S.G. 2020. *Il virus dell'occidente: Universalismo astratto e sovranismo particolarista di fronte allo stato d'eccezione*. Mimesis.

Backhouse, M. 2014. Green grabbing—the case of palm oil expansion in so-called degraded areas in the eastern Brazilian Amazon *In*: K. Dietz, B. Engels, O. Pye and A. Brunnengräber, eds. *The Political Ecology of Agrofuels*. Routledge, pp. 181–199.

Backhouse, M. 2016. The Discursive Dimension of Green Grabbing: Palm Oil Plantations as Climate Protection Strategy in Brazil. *Pléyade. Revista de Humanidades y Ciencias Sociales*.

Bair, J. 2005. Global Capitalism and Commodity Chains: Looking Back, Going Forward. *Competition & Change*. **9**(2),pp.153–180.

Baker, S. 2007. Sustainable development as symbolic commitment: Declaratory politics and the seductive appeal of ecological modernisation in the European Union. *Environmental Politics*. **16**(2),pp.297–317.

Baker, S. 2012. The evolution of European Union environmental policy *In*: *The politics of sustainable development: Theory, policy and practice within the European Union*., pp. 89–104.

Baran, P.A. 1957. *The political-economy of growth*. Monthly Review Press.

Barbagallo, F. 2017a. L'industria al nord, l'esodo al sud. *La Repubblica*.,pp.14–15.

Barbagallo, F. 2017b. *La questione italiana. Il Nord e il Sud dal 1860 a oggi*. Laterza.

Barbagallo, F. (ed.). 1997. *Storia dell'Italia repubblicana: II. La trasformazione dell'Italia: sviluppo e squilibri: 1. Politica, economia, società*. Einaudi.

Barbagallo, F. 2011. *Storia della camorra*. Laterza & Figli Spa.

Barbagallo, F., Sales, I. and Becchi Collidà, A. 1989. *L'affare terremoto. Libro bianco sulla ricostruzione*. P.C.I. Comitato Regionale della Campania.

Barbaro, E. 2016. Eolico selvaggio: la commissione approva la linea Iannace. *il Ciriaco*. [Online]. Available from: https://www.ilciriaco.it/11/03/2016/eolico-selvaggio-la-commissione-approva-la-linea-iannace-individuare-siti-non-idonei-e-sospendere-nuove-autorizzazioni/.

Barbetti, T. 2016. L'eolico in Italia spiegato bene. Quanto è, chi lo fa e perché ha un futuro. *RIENERGIA*. [Online]. Available from: https://rienergia.staffettaonline.com/articolo/32848/L'eolico+in+Italia+spiegato+bene.+Quanto+è,+chi+lo+fa+e+perché+ha+un+futuro/Barbetti+.

Barbier, E.B. and Markandya, A. 2013. *A new blueprint for a green economy*. Routledge.

Barca, F. and Trento, S. 1997. La parabola delle partecipazioni statali: una missione tradita *In*: *Storia del capitalismo italiano dal dopoguerra a oggi* [Online]. Roma: Donzelli. [Accessed 21 July 2020]. Available from: https://iris.unitn.it/handle/11572/72141#.Xxb35J4zZEY.

Barca, S. 2009. Pane e veleno. *Zapruder: Rivista di storia della conflittualitá sociale*. (24),pp.100–107.

Bauerkämper, A. 2005. *Die Sozialgeschichte der DDR* [Online]. München: Oldenbourg Wissenschaftsverlag GmbH. [Accessed 15 May 2020]. Available from: http://www.degruyter.com/view/books/9783486701562/9783486701562/9783486701562.xml.

Bauerkämper, A. (ed.). 1996. *'Junkerland in Bauernhand'?* Franz Steiner Verlag.

Bauerkämper, A., Danyel, J., Hübner, P. and Ross, S. (eds.). 1997. *'Gesellschaft ohne Eliten.' Führungsgruppen in der DDR. Berlin*. Metropol.

BAYER n.d. Farming Forward - Sustainable Agricultural Solutions | Bayer Crop Science.

[Accessed 16 May 2020]. Available from: https://www.cropscience.bayer.com/people-planet/global-impact/forwardfarming.

Becchi Collidà, A. 1988. Catastrofi, sviluppo e politiche del territorio: alcune riflessioni sull'esperienza italiana. *Archivio di studi urbani e regionali*. (3),pp.3–36.

Beck, U. 1992a. From industrial society to risk society. *Theory, culture & society*. **9**(1),pp.97–123.

Beck, U. 1992b. *Risk Society: Towards a New Modernity*. SAGE Publications Ltd.

Becker, G. 2015. *Econometric analysis of the wealth gap between East and West Germany*.

Beckmann, V. 1995. De-collectivisation policies ans structural changes of agriculture in eastern Germany. ,pp.133–152.

Berger, S. (ed.). 1983. *L'organizzazione delgi interessi nell'Europa occidentale: pluralismo, corporativismo e la transformazione della politica* [Online]. Società Ed. il Mulino. [Accessed 16 July 2020]. Available from: https://www.amazon.it/Lorganizzazione-degli-interessi-nellEuropa-occidentale/dp/8815003150.

Von Bertalanffy, L. 1968. *General system theory*. George Braziller.

Bhatia, S.C. 2014. Issues relating to biofuels *In*: *Advanced Renewable Energy Systems*. Elsevier, pp. 688–718.

Del Biaggio, C. 2015. Territory beyond the Anglophone Tradition *In*: *The Wiley Blackwell Companion to Political Geography*., pp. 35–47.

Bianchi, S. 2004. *Settantasette* (S. Bianchi, ed.). DeriveApprodi.

Bloomfield, J. and Steward, F. 2020. The politics of the green new deal. *The Political Quarterly*. **91**(4),pp.770–779.

Bonelli, F. 1978. *Il capitalismo italiano : linee generali d'interpretazione*. Einaudi.

Bonesio, L. 2012. La questione epistemologica e il linguaggio : territorio, luogo, paesaggio *In*: A. Magnaghi, ed. *Il territorio bene comune* [Online]. Firenze University Press, pp. 57–69. [Accessed 24 July 2019]. Available from: https://www.torrossa.com/it/resources/an/2504480.

Borras Jr, S., Franco, J.C. and van der Ploeg, J.D. (eds.). 2013. *Land concentration, land grabbing and people's struggles in Europe* [Online]. TNI. Available from: internal-pdf://187.28.216.84/land grabbing_in_europe-jun2013.pdf.

Borras, S.M. and Franco, J.C. 2012. Global Land Grabbing and Trajectories of Agrarian Change: A Preliminary Analysis. *Journal of Agrarian Change*. [Online]. **12**,pp.34–59. Available from: file:///C:/Users/gysli/Dropbox/Knowledge/PhD/Commons and land grabbing/Theoretic debate and textbooks/Global Land Grabbing and Trajectories of Agrarian Change.pdf.

Borsa Italiana 2017. Il vento (nuovo) dell'energia. ,pp.2015–2017.

Bösch, F. and Graf, R. 2014. Reacting to anticipations: Energy crises and energy policy in the 1970s. An introduction. *Historical Social Research*. **39**(4),pp.7–21.

Brand, K.W. 2014. Dialectics of institutionalisation: The transformation of the environmental movement in Germany *In*: *Environmental Movements: Local, National and Global*. Taylor and Francis, pp. 35–58.

Brand, U., Ashley, B., Becker, S., Ceceña, A.E., Charitsis, A., Velegrakis, G., Knottnerus, R., Kucharz, T., Leon, J., Mhinda, A.M., Omar, S.M. and Tricarico, A. 2013. Energy Policy and Resource Extractivism *In*: M. Gensler, ed., pp. 24–26.

Bratsis, P. 2014. Political Corruption Under Transnational Capitalism : *The Marxist*. **XXX 3**(September).

Breitschuh, G., Reinhold, G. and Vetter, A. 2004. *Wirtschaftliche Bedeutung der energetischen Nutzung nachwachsender Rohstoffe fur die Landwirtschaft:: Der Landwirt als Energiewirt-Potenziale fur die*.

Brenner, N. 1999. Globalisation as reterritorialisation: The re-scaling of urban governance in the European union. *Urban Studies*. **36**(3),pp.431–451.

Bromley, D.W. and Cernea, M.M. 1989. The management of common property natural resources: Some conceptual and operational fallacies. *World Bank Publications*. **57**.

Brown, T. 2016. Sustainability as Empty Signifier: Its Rise, Fall, and Radical Potential. *Antipode*. **48**(1),pp.115–133.

Brundtland, G.H., Khalid, M., Agnelli, S., Al-Athel, S. and Chidzero, B.J.N.Y. 1987. *Our Common Future* [Online]. New York. Available from: http://library1.nida.ac.th/termpaper6/sd/2554/19755.pdf.

Brunner, J. 2019. *Land Grabbing in Ostdeutschland: Ursachen, Auswirkungen, Widerstand.* Berlin.

Bruns, E., Ohlhorst, D., Wenzel, B. and Köppel, J. 2011. *Renewable energies in Germany's electricity market: A biography of the innovation process*.

Buch-Hansen, M. 2003. The territorialisation of rural Thailand: Between localism, nationalism and globalism. *Tijdschrift voor Economische en Sociale Geografie*. **94**(3),pp.322–334.

Buğra, A., Ağartan, K. and Jessop, B. 2007. Knowledge as a Fictitious Commodity: Insights and Limits of a Polanyian Perspective. *Reading Karl Polanyi for the Twenty-First Century*.,pp.115–133.

Bullard, R. 1990. *Dumping in Dixie: Race, Class and Environmental Quality*. Boulder, CO: Westview.

Bulletin of the European Communities 1972. *Statement from the Paris Summit*.

Burke, M.J. and Stephens, J.C. 2018. Political power and renewable energy futures: A critical review. *Energy Research and Social Science*. [Online]. **35**(October 2017),pp.78–93. Available from: https://doi.org/10.1016/j.erss.2017.10.018.

Bürklin, W.P. 1985. The german greens: The Post-Industrial Non-Established and the Party System. *International Political Science Review*. **6**(4),pp.463–481.

Camilli, D. 2018. Assediata la centrale, guerriglia a Montalto. [Accessed 15 July 2020]. Available from: http://www.tusciaweb.eu/2018/10/assediata-la-centrale-guerriglia-montalto/.

Campione, G. 2019. Eolico, troppi incentivi nel Foggiano, il business attira «buoni e cattivi». *La Gazzetta del Mezzogiorno*. [Online]. Available from: https://www.lagazzettadelmezzogiorno.it/news/home/1154894/eolico-troppi-incentivi-nel-foggiano-il-business-attira-buoni-e-cattivi.html.

Campisi, D., Gitto, S. and Morea, D. 2016. Effectiveness of incentives for wind energy: Models and empirical evidences from an italian case study. *Journal of Sustainability Science and Management*. **11**(2),pp.39–48.

Campisi, D., Gitto, S. and Morea, D. 2018. Shari'ah-Compliant Finance: A Possible Novel Paradigm for Green Economy Investments in Italy. *Sustainability*. [Online]. **10**(11),p.3915. [Accessed 8 October 2020]. Available from: http://www.mdpi.com/2071-1050/10/11/3915.

Caneppele, S., Riccardi, M. and Standridge, P. 2013. Green energy and black economy: Mafia investments in the wind power sector in Italy. *Crime, Law and Social Change*. [Online]. **59**(3),pp.319–339. [Accessed 12 October 2020]. Available from: https://link.springer.com/article/10.1007/s10611-013-9418-1.

Caporale, A. 2011a. *Controvento, il tesoro che il Sud non sa di avere*. Mondadori.

Caporale, A. 2011b. *Terremoti Spa*. Rizzoli.

Carson, R. 1965. *Silent spring*. Penguin Classics.

Castree, N. 2008a. Neoliberalising nature: processes, effects, and evaluations. *Environment and planning A*. [Online]. **40**,pp.153–173. Available from: internal-pdf://152.0.8.181/Neoliberalising_nature_Processes_effects_and_e.pdf.

Castree, N. 2008b. Neoliberalising nature: the logics of deregulation and reregulation. *Environment and planning A*. [Online]. **40**,pp.131–152. Available from: internal-pdf://178.88.128.153/Neoliberalising nature_the logics of deregulat.pdf.

Castree, N. 2005. The epistemology of particulars: Human geography, case studies and 'context'. *Geoforum*. **36**(5),pp.541–544.

Castronovo, V. 2013. *Storia economica d'Italia*. Einaudi.

Ceres, M. 2016. *Viaggio nell'Irpinia del terremoto e dei nostri giorni. Il dramma, i pregiudizi, la rinascita*. Delta 3.

Checchi, V.V. and Polo, M. 2020. Blowing in the Wind: The Infiltration of Sicilian Mafia in the Wind Power Business. *Italian Economic Journal*. [Online]. **6**(2),pp.325–353. [Accessed 8 October 2020]. Available from: https://doi.org/10.1007/s40797-020-

00126-z.

Christoph H., S. 2014. Energiewende: Critical Junctures and Path Dependencies Since 1990 *In*: *Rapide Politikwechsel in der Bundesrepublik*. Nomos, pp. 48–71.

Ciconte, E. 2020. *La grande mattanza. Storia della guerra al brigantaggio* [Online]. Laterza. [Accessed 20 July 2020]. Available from: https://www.libreriauniversitaria.it/grande-mattanza-storia-guerra-brigantaggio/libro/9788858140802?utm_source=google-shopping&utm_medium=cpc&utm_term=9788858140802&utm_content=Libri Italiani&utm_campaign=google-shopping-lib&gclid=CjwKCAjwgdX4BRB_EiwAg8O8.

Cimmarusti, I. 2020. Mazzette in cambio favori, Siri a rischio processo. *Il Sole 24Ore*.

Clark, B. and Foster, J.B. 2009. Ecological imperialism and the global metabolic rift: Unequal exchange and the guano/nitrates trade. *International Journal of Comparative Sociology*. **50**(3–4),pp.311–334.

Clarke, S. 1991. *Marx, Marginalism and Modern Sociology*. Palgrave Macmillan.

Clements, L., Dai, L. and Hugo, C. 2020. *Investing in the green economy – sizing the opportunity*.

Cordier, T. 1996. Cleavages in green parties: The gases of the Dutch, French and German Greens. *Innovation: The European Journal of Social Science Research*. [Online]. **9**(4),pp.491–507. [Accessed 14 May 2020]. Available from: https://www.tandfonline.com/doi/abs/10.1080/13511610.1996.9968505.

Corson, C. 2011. Territorialization, enclosure and neoliberalism: Non-state influence in struggles over Madagascar's forests. *Journal of Peasant Studies*. **38**(4),pp.703–726.

Corson, C. and MacDonald, K.I. 2012. Enclosing the global commons: the convention on biological diversity and green grabbing. *Journal of Peasant Studies*. [Online]. **39**,pp.263–283. Available from: internal-pdf://153.131.221.69/Enclosing the global commons the convention on.pdf internal-pdf://0443953006/Enclosing the global commons the convention o1.pdf.

Corson, C., MacDonald, K.I. and Neimark, B. 2013. Grabbing "green": markets, environmental governance and the materialization of natural capital. *Human*

Geography. [Online]. **6**,pp.1–15. Available from: internal-pdf://82.148.37.125/Grabbing_Green_Markets_Environmental_Gov1.pdf.

Cospito, G. 2016. Egemonia / egemonico nei " Quaderni del carcere " (e prima). . **2**(1),pp.49–88.

Costanza, R., Arge, R., Groot, R. De, Farberk, S., Grasso, M., Hannon, B., Limburg, K., Naeem, S., O'Neill, R. V, Paruelo, J., Raskin, R.G., Suttonkk, P. and van den Belt, M. 1997. The value of the world 's ecosystem services and natural capital. *Nature*. [Online]. **387**,pp.253–260. Available from: internal-pdf://220.31.201.200/Costanza-1997-The value of the world ' s ecosy.pdf.

Costanza, R., de Groot, R., Sutton, P., van der Ploeg, S., Anderson, S.J., Kubiszewski, I., Farber, S. and Turner, R.K. 2014. Changes in the global value of ecosystem services. *Global Environmental Change*. **26**,pp.152–158.

Côte, M. and Korf, B. 2018. Making Concessions: Extractive Enclaves, Entangled Capitalism and Regulative Pluralism at the Gold Mining Frontier in Burkina Faso. *World Development*. [Online]. **101**,pp.466–476. Available from: https://doi.org/10.1016/j.worlddev.2016.11.002.

Cotula, L. 2012. The international political economy of the global land rush: A critical appraisal of trends, scale, geography and drivers. *The Journal of Peasant Studies*. [Online]. **39**,pp.649–680. Available from: internal-pdf://195.138.97.67/The international political economy of the gl1.pdf.

Crutzen, P.J. and Stoermer, E.F. 2000. The Anthropocene. *IGBP [International Geosphere-Biosphere Programme] Newsletter*. (41),pp.17–18.

Cumbers, A. 2015. Constructing a global commons in , against and beyond the state. *Space and Polity*. [Online]. **0**(0),pp.1–14. Available from: http://dx.doi.org/10.1080/13562576.2014.995465.

Cumbers, A. and Becker, S. 2018. Making sense of remunicipalisation: Theoretical reflections on and political possibilities from Germany's Rekommumalisierung process. *Cambridge Journal of Regions, Economy and Society*. **11**(3),pp.503–517.

Cumbers, A. and Paul, Fr. 2021. Remunicipalisation, mutating neoliberalism and the conjuncture. *Antipode*.,pp.1–21.

D'ascenzio, A. and Ferraro, S. 2015. Discorsi e verità nell'Irpinia dell'Expo e delle trivelle. *Cartografie sociali. Rivista di sociologia e scienze umane*. [Online]. **0**(1). [Accessed 14 October 2020]. Available from: https://universitypress.unisob.na.it/ojs/index.php/cartografiesociali/article/view/57.

Dalpane, E. 2015. L'eolico in Italia dagli anni '80 ad oggi. *L'Energia Eletrica*. (maggio-giugno).

Daly, H.E. 1991. *Steady-state economics: with new essays*. Island Press.

Damania, R. 2001. When the weak win: The role of investment in environmental lobbying. *Journal of Environmental Economics and Management*. **42**(1),pp.1–22.

Daniel-Gromke, J., Rensberg, N., Denysenko, V., Stinner, W., Schmalfuß, T., Scheftelowitz, M., Nelles, M. and Liebetrau, J. 2018. Current Developments in Production and Utilization of Biogas and Biomethane in Germany. *Chemie Ingenieur Technik*. [Online]. **90**(1–2),pp.17–35. [Accessed 5 December 2019]. Available from: http://doi.wiley.com/10.1002/cite.201700077.

Dänzer, D. 2006. Vom Landwirt zum Energiewirt. *Energietechnik*.

Dechézelles, S. and Scotti, I. 2021. Wild Wind, Social Storm: "Energy Populism" in Rural Areas? An Exploratory Analysis of France and Italy. *Rural sociology*. **0**(0),pp.1–30.

Dinmore, G. 2010. Anti-mafia police make largest asset seizure.

Dinmore, G. 2009. Green energy tangled in web of shady deals. *Financial Times*.

Drake, F. 2011. Protesting Mobile Phone Masts: Risk, Neoliberalism, and Governmentality. *Science, Technology & Human Values*. **36**,pp.522–548.

Dryzek, J.S. 1983. Ecological rationality. *International Journal of Environmental Studies*. **21**(1),pp.5–10.

Dryzek, J.S. 2013. *The politics of the earth: Environmental discourses*. Oxford University

Press.

Duffy, A., Hand, M., Wiser, R., Lantz, E., Dalla Riva, A., Berkhout, V., Stenkvist, M., Weir, D. and Lacal-Arántegui, R. 2020. Land-based wind energy cost trends in Germany, Denmark, Ireland, Norway, Sweden and the United States. *Applied Energy*. **277**,p.114777.

Dunlap, A. 2018. Counterinsurgency for wind energy: the Bíi Hioxo wind park in Juchitán, Mexico. *The Journal of Peasant Studies*. [Online]. **45**(3),pp.630–652. Available from: https://www.tandfonline.com/doi/full/10.1080/03066150.2016.1259221.

DVB 2019. *Situationsbericht 2019/20* [Online]. Deutscher Bauernverband e.V. Available from: https://www.bauernverband.de/situationsbericht-19/1-landwirtschaft-und-gesamtwirtschaft.

Ehrlich, P.R. 1968. *The Population Bomb*. Ballantine Books.

Ekers, M. and Prudham, S. 2017. The Metabolism of Socioecological Fixes: Capital Switching, Spatial Fixes, and the Production of Nature. *Annals of the American Association of Geographers*. **107**(6),pp.1370–1388.

Ekers, M. and Prudham, S. 2018. The Socioecological Fix: Fixed Capital, Metabolism, and Hegemony. *Annals of the American Association of Geographers*. **108**(1),pp.17–34.

El-Sharif, Y. 2007. Grain power instead of nuclear power. ,pp.2–3.

Elden, S. 2013. *The Birth of Territory*. University of Chicago Press.

Emmann, C.H., Guenther-Luebbers, W. and Theuvsen, L. 2013. Impacts of Biogas Production on the Production Factors Land and Labour – Current Effects , Possible Consequences and Further Research Needs. *International Journal of Food System Dynamics*. **4**(1),pp.550–566.

Emmanuel, A. and Bettelheim, C. 1962. Echange inégal *In*: A. Emmanuel and C. Bettelheim, eds. *Echange inégal et politique de développement*., pp. 1–32.

EnviTec Biogas n.d. History – EnviTec Biogas AG. [Accessed 16 May 2020]. Available from: https://www.envitec-biogas.com/company/history.

Escobar, A. 2008. *Territories of difference*. Duke University Press.

Euler, C. 2013. "Verkappte Lieferanten aus China akzeptieren wir nicht“. Available from: https://www.welt.de/finanzen/verbraucher/article119590038/Verkappte-Lieferanten-aus-China-akzeptieren-wir-nicht.html.

European Commission n.d. Brandenburg - Internal Market, Industry, Entrepreneurship And Smes - European Commission. [Accessed 15 May 2020a]. Available from: https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/brandenburg.

European Commission n.d. Energy Service Companies (ESCOs). [Accessed 16 May 2020b]. Available from: https://e3p.jrc.ec.europa.eu/communities/energy-service-companies.

EUROPOL 2013. Italian organised crime. *Europol Public Information*. **7**(6),pp.11–17.

Eyl-Mazzega, M.-A., Mathieu, C., Boesgaard, K., Daniel-Gromke, J., Denysenko, V., Liebetrau, J. and Cornot-Gandolphe, S. 2019. *Biogas and Bio-methane in Europe: Lessons from Denmark, Germany and Italy* [Online]. Available from: http://inis.iaea.org/search/search.aspx?orig_q=RN:50050009.

Fairhead, J., Leach, M. and Scoones, I. 2012. Green Grabbing: a new appropriation of nature? *Journal of Peasant Studies*. [Online]. **39**,pp.237–261. Available from: internal-pdf://239.82.49.140/Green Grabbing_a new appropriation of nature.pdf.

Farolfi, B. and Fornasari, M. 2011. *Agricoltura e sviluppo economico : il caso italiano (secoli XVIII-XX)*.

Fiscalità dell’Energia 2020. Alla Corte Costituzionale la legittimità delle “Royalties” agli enti locali per la realizzazione di impianti di energia rinnovabile - Fiscalità dell’Energia. *Fiscalitá dell’Energia*. [Online]. [Accessed 12 October 2020]. Available from: https://www.fiscalitadellenergia.it/2020/01/21/alla-corte-costituzionale-la-legittimita-delle-royalties-agli-enti-locali-per-la-realizzazione-di-impianti-di-energia-rinnovabile/.

FNR 2017. *Bioenergy in Germany – Facts and Figures 2017* [Online]. Available from:

http://www.fnr.de/fileadmin/allgemein/pdf/broschueren/Broschuere_Basisdaten_Bioenergie_englisch_2017.pdf.

FNR 2013. *Biogas an introduction*.

FNR 2012. *Guide to Biogas: From production to use* [Online]. Available from: www.fnr.de.

FNR 2014. *Guide to biogas upgrading and feeding*.

Foster, J.B. 2000. *Marx's ecology: Materialism and nature*. NYU Press.

Foster, J.B. 1999. Marx ' s Theory of Metabolic Rift : Classical Foundations for Environmental Sociology. *American Journal of Sociology*. [Online]. **105**(2),pp.366–405. Available from: internal-pdf://124.249.188.44/Marx s Theory of Metabolic Rift.pdf.

Foucault, M., Davidson, A.I. and Burchell, G. 2010. *The government of self and others: Lectures at the College de France, 1982-1983*. Springer.

Franco, J.C., Borras, S.J., Alonso-Fradejas, A., Buxton, N., Herre, R., Kay, S. and Feodoroff, T. 2013. *The Global Land Grab. A primer* [Online]. Available from: internal-pdf://59.238.7.49/landgrabbingprimer-feb2013.pdf.

Friedrich-Ebert-Stiftung 1988. Die Energiepolitik der DDR: Mängelverwaltung zwischen Kernkraft und Braunkohle. [Accessed 14 May 2020]. Available from: https://books.google.it/books/about/Die_Energiepolitik_der_DDR.html?id=x-BMAQAAIAAJ&redir_esc=y.

Galullo, R. 2012. Mafia Spa , in cassa 65 miliardi. *Il Sole 24Ore*.

Gayer, L. 2014. *Karachi: Ordered disorder and the struggle for the city*. Oxford University Press (UK).

Georgescu-Roegen, N. 1986. The entropy law and the economic problem in Retrospect. *Valuing the earth: Economics, ecology, ethics*. **12**(1),pp.75–88.

Georgescu-Roegen, N. 1971. *The entropy law and the economic process*. Harvard University Press.

Gereffi, G., Korzeniewicz, M. and Korzeniewicz, R.P. 1994. Introduction: Global Commodity

Chains *In*: *Commodity chains and global capitalism*. Westport: Praeger Publishers.

Gerke, J. 2018. Landgrabbing in Eastern Germany and Eastern Europe. ,pp.1–24.

German Bundestag 2012. *Ordinance on the Generation of Electricity from Biomass (Biomass Ordinance - BiomasseV)*.

German Federal Government 2019. Ostdeutschland holt auf. [Accessed 15 May 2020]. Available from: https://www.bundesregierung.de/breg-de/aktuelles/stand-der-deutschen-einheit-1674894.

Giacalone, R. 2013. Vito Nicastri , il " re del vento " tra ma a , ' ndrangheta e entrature politiche. *Il Fatto Quotidiano*.

Giacchè, V. 2013. *ANSCHLUSS. L'annessione: L'unificazione della Germania e il futuro dell'Europa.* Imprimatur Editore.

Giannini, M., Minervini, D. and Scotti, I. 2012. The Wind-Farm Developer: A New Green Expert Connecting Métier and Profession. *Energy Issues and Social Sciences, Theories and Applications*.,pp.151–162.

Giardini, F. and Marini, G. 2018. *La valutazione di impatto ambientale in Italia: applicazione al caso Expo 2015 I Paper dell'Osservatorio* [Online]. [Accessed 12 October 2020]. Available from: www.osservatorioair.it,.

Gilbert, J. 2016. Land grabbing, investors, and indigenous peoples: New legal strategies for an old practice? *Community Development Journal*. **51**(3),pp.350–366.

Glassman, J. 2007. Recovering from crisis: The case of Thailand's spatial fix. *Economic Geography*. **83**(4),pp.349–370.

Glyn, A. and Sutcliffe, R. 1972. *British Capitalism, Workers and the Profit Squeeze*. Penguin Books Ltd.

Gómez-Baggethun, E., De Groot, R., Lomas, P.L. and Montes, C. 2010. The history of ecosystem services in economic theory and practice: from early notions to markets and payment schemes. *Ecological economics*. [Online]. **69**,pp.1209–1218. Available from: internal-pdf://162.181.146.53/1-s2.0-S092180090900456X-main.pdf.

Government of Brandenburg 2014. Renewable energies: More money for local communities Ministry of Finance and for Europe. [Accessed 16 May 2020]. Available from: https://mdfe.brandenburg.de/cms/detail.php/bb1.c.381948.de.

Goyal, S., Maurya, S.K., Kumar, S. and Agarwal, D. 2020. A Consolidation Review of Major Wind Turbine Models in Global Market *In*: *2020 International Conference on Power Electronics and IoT Applications in Renewable Energy and its Control, PARC 2020*. Institute of Electrical and Electronics Engineers Inc., pp. 246–251.

GRAIN 2013. Collating and dispersing: GRAIN's strategies and methods. *Journal of Peasant Studies*. [Online]. **40**,pp.531–536. Available from: internal-pdf://232.198.77.101/Collating and dispersing GRAIN s strategies an.pdf.

Gramsci, A. 2014. *La questione meridionale* [Online] (N. D. Chiesa, ed.). Melampo. [Accessed 20 July 2020]. Available from: https://www.lafeltrinelli.it/libri/antonio-gramsci/questione-meridionale/9788898231300?awaid=9507&gclid=CjwKCAjwgdX4BRB_EiwAg8O8HSt82QPF5ZzPqFdcAq2DTTkYwum-MyJAuGPSQqsMGizMLedEi_PNSRoCOzIQAvD_BwE&awc=9507_1595266089_a6737095a2d2ef0c761b951a37665aee.

Gramsci, A. 1975. *Quaderni dal carcere, ed* (V. Gerratana, ed.). Einaudi.

Gramsci, A., Nowell-Smith, G. and Hoare, Q. 1971. *Selections from the Prison Notebooks of Antonio Gramsci: Ed. and Transl. by Quintin Hoare and Geoffrey Nowell Smith*. International Publishers.

Graziani, A. and Pugliese, E. 1979. *Investimenti e disoccupazione nel Mezzogiorno - A.Graziani*. Bologna: Il Mulino.

Gribaudi, G. 1991. *Mediatori. Antropologia del potere democristiano nel Mezzogiorno* [Online]. Rosenberg & Sellier. [Accessed 16 July 2020]. Available from: https://www.amazon.it/Mediatori-Antropologia-potere-democristiano-Mezzogiorno/dp/8870114392.

GSE 2017. *Il punto sull'eolico*.

GSE 2018. *Regolazione regionale - Generazione elettrica da fonti rinnovabili* [Online]. Available from: https://www.gse.it/documenti_site/Documenti GSE/Studi e scenari/Regolazione regionale_31_12_2018.pdf.

Gu Choi, D., Yong Park, S., Park, N.B. and Chul Hong, J. 2015. Is the concept of 'grid parity' defined appropriately to evaluate the cost-competitiveness of renewable energy technologies? *Energy Policy*. [Online]. **86**,pp.718–728. Available from: http://dx.doi.org/10.1016/j.enpol.2015.08.021.

GWEC 2019. *Global wind report 2018* [Online]. Available from: www.gwec.net.

Hadjimichalis, C. 2014. Crisis and land dispossession in Greece as part of the global 'land fever'. *City*. **18**(4–5),pp.502–508.

Hagedorn, K. 2014. Post-socialist farmers' cooperatives in central and eastern Europe. *Annals of Public and Cooperative Economics*. [Online]. **85**(4),pp.555–577. [Accessed 5 December 2019]. Available from: http://doi.wiley.com/10.1111/apce.12051.

Hagen, W.W. 2002. *Ordinary Prussians : Brandenburg Junkers and villagers, 1500-1840*. Cambridge University Press.

Hajer, M.A. 1997. *The Politics of Environmental Discourse*. Oxford University Press.

Hake, J.F., Fischer, W., Venghaus, S. and Weckenbrock, C. 2015. The German Energiewende - History and status quo. *Energy*. **92**,pp.532–546.

Hall, D. 2013. Primitive Accumulation, Accumulation by Dispossession and the Global Land Grab. *Third World Quarterly*. [Online]. **34**(09),pp.1582–1604. Available from: internal-pdf://188.171.198.61/Primitive Accumulation Accumulation by Disposs.pdf.

Halvorsen, S. 2018. Decolonising territory: Dialogues with Latin American knowledges and grassroots strategies. *Progress in Human Geography*.

Hamelinck, C. 2013. *Land grabs for biofuels driven by EU biofuels policies* [Online]. Utrecht: Ecofys. Available from: internal-pdf://167.122.151.84/ecofys-2013-report-on-land-grabbing-for-biofue.pdf.

Hammersley, M. and Atkinson, P. 1995. *Ethnography: Principles in Practice*. Routledge.

Han, X. and Lakshmanan, T.. 1994. Structural changes and energy consumption in the Japanese economy 1975-95: An input-output analysis. *The Energy Journal*. **15**(3).

Haraway, D.J. 2017. Anthropocene, capitalocene, plantationocene, chthulucene: Making kin. *Multitudes*. **65**(4),pp.75–81.

Haraway, D.J. 2016. *Staying with the trouble: Making kin in the chthulucene* [Online]. Duke University Press. [Accessed 25 November 2020]. Available from: https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Staying+with+the+trouble%3A+Making+kin+in+the+chthulucene+haraway&oq=Staying+with+the+trouble%3A+Making+kin+in+the+Chthulucene+ha.

Hardin, G. 1961. *Biology: its principles and implications*. W.H. Freeman and Company.

Hardin, G. 1968. The Tragedy of the Commons. *Science*. **1243**.

Hardt, M. and Negri, A. 2009. *Commonwealth*. Cambridge: Oxford University Press.

Hartmann, H., Reisinger, K., Turowski, P., (2, P.R.-B.K. and 2007, U. 2007. *Handbuch Bioenergie-Kleinanlagen*. FNR.

Harvey, D. 2005a. *A brief history of neoliberalism* [Online]. Oxford: Oxford University Press. Available from: internal-pdf://80.168.251.79/ABriefHistoryNeoliberalism.pdf.

Harvey, D. 2018a. *A companion to Marx's Capital: The complete edition*. Verso Books.

Harvey, D. 2018b. *The limits to capital*. Verso.

Harvey, D. 2005b. *The new imperialism*. OUP Oxford.

Hegel, G.W.F. 1977. *Phenomenology of the spirit*. Oxford University Press 1977.

Hegel, G.W.F. 1969. *Science of logic* (A. V. Miller, ed.).

Hegel, G.W.F. and Inwood, M. 2007. *Hegel: Philosophy of Mind*. Oxford University Press.

Herre, R. 2013. Land concentration, land grabbing and options for change in Germany *In*: J. C. Franco and M. B. J. Saturnino, eds. *Land concentration, land grabbing and people's struggles in Europe*., pp. 62–69.

Heuser, A. 2015. Discourses on East German land property concentration by Alessa Heuser.

Hickey, S. and Du Toit, A. 2013. Adverse incorporation, social exclusion, and chronic poverty *In*: *Chronic Poverty*. Springer, pp. 134–159.

Hirschl, R. 2011. *The Judicialization of Politics*. Oxford University Press.

Hodkinson, S. and Essen, C. 2015. Grounding accumulation by dispossession in everyday life: The unjust geographies of urban regeneration under the private finance initiative. *International Journal of Law in the Built Environment*. **7**(1),pp.72–91.

Holloway, J. 2005. *Change the world without taking power: The meaning of revolution today (2nd ed.)*. London: Pluto.

Hopkins, T.K. and Wallerstein, I. 1986. Commodity Chains in the World-Economy, 1590-1790. *Review (Fernand Braudel Center)*. **10**(1),pp.157–170.

Houlgate, S. 2005. An Introduction to Hegel. Freedom, Truth and History *In*: Wiley-Blackwell.

Howard, D.C., Burgess, P.J., Butler, S.J., Carver, S.J., Cockerill, T., Coleby, A.M., Gan, G., Goodier, C.J., Van der Horst, D., Hubacek, K., Lord, R., Mead, A., Rivas-Casado, M., Wadsworth, R.A. and Scholefield, P. 2013. Energyscapes: Linking the energy system and ecosystem services in real landscapes. *Biomass and Bioenergy*. **55**,pp.17–26.

Howe, C. and Boyer, D. 2016. Aeolian Extractivism and Community Wind in Southern Mexico. *Public Culture*. **28**(2 79),pp.215–235.

Hsieh, H.F. and Shannon, S.E. 2005. Three approaches to qualitative content analysis. *Qualitative Health Research*. **15**(9),pp.1277–1288.

Huber, J. 1982. *Die verlorene Unschuld der Ökologie: neue Technologien und superindustrielle Entwicklung*. S. Fischer.

Huber, J. 2000. Towards industrial ecology: Sustainable development as a concept of ecological modernization. *Journal of Environmental Policy and Planning*. **2**(4),pp.269–285.

Hubik, F. 2016. LOST SUBSIDIES: Running on Empty. *Handelsblatt today*. [Online]. [Accessed 16 May 2020]. Available from: https://www.handelsblatt.com/today/companies/lost-subsidies-running-on-

empty/23535880.html.

Humphrey, J. and Schmitz, H. 2000. *Governance and upgrading: Linking industrial cluster and global value chain research*. Brighton: Institute of Development Studies.

Hunsberger, C., Corbera, E., Borras, S.M., Franco, J.C., Woods, K., Work, C., de la Rosa, R., Eang, V., Herre, R., Kham, S.S., Park, C., Sokheng, S., Spoor, M., Thein, S., Aung, K.T., Thuon, R. and Vaddhanaphuti, C. 2017. Climate change mitigation, land grabbing and conflict: towards a landscape-based and collaborative action research agenda. *Canadian Journal of Development Studies*. **38**(3).

Hytten, E. and Marchioni, M. 1970. *Industrializzazione senza sviluppo. Gela: una storia meridionale* [Online] 1. ed. Franco Angeli. [Accessed 25 July 2019]. Available from: https://www.econbiz.de/Record/industrializzazione-senza-sviluppo-gela-una-storia-meridionale-hytten-eyvind/10002731175.

Ikenberry, G.J. 1986. The irony of state strength: Comparative responses to the oil shocks in the 1970s. *International Organization*. **40**(1),pp.105–137.

Ikenberry, G.J. 2018. The Oil Shocks and State Responses *In*: *Reasons of State*., pp. 1–20.

IPBES 2019. *Global Assessment Report on Biodiversity and Ecosystem Services* [Online]. Available from: https://ipbes.net/system/tdf/ipbes_global_assessment_report_summary_for_policymakers.pdf?file=1&type=node&id=35329.

IRENA 2020. *Renewable Energy and Jobs: Annual Review 2020*.

Italian Parliament 1991. *Commissione parlamentare di inchiesta sulla attuazione degli interventi per la ricostruzione e lo sviluppo dei territori della Basilicata e della Campania colpiti dai terremoti del novembre 1980 e febbraio 1981*.

Italian Parliament 1981. *Piano Energetico Nazionale*.

Italian Parliament 2012. Senato della Repubblica 6a Commissione. . **2012**(500),pp.1–15.

Jacobs, D. 2012. The German Energiewende – History, Targets, Policies and Challenges. *Renewable Energy Law and Policy*. **3**(4),pp.223–234.

Jacobs, M. 1993. *The green economy: Environment, sustainable development and the politics of the future*. UBC pres.

Jacobson, M.Z. and Delucchi, M.A. 2011. Providing all global energy with wind, water, and solar power, Part I: Technologies, energy resources, quantities and areas of infrastructure, and materials. *Energy Policy*. [Online]. **39**(3),pp.1154–1169. Available from: http://dx.doi.org/10.1016/j.enpol.2010.11.040.

Jacobson, M.Z., Delucchi, M.A., Bauer, Z.A.F., Goodman, S.C., Chapman, W.E., Cameron, M.A., Bozonnat, C., Chobadi, L., Clonts, H.A., Enevoldsen, P., Erwin, J.R., Fobi, S.N., Goldstrom, O.K., Hennessy, E.M., Liu, J., Lo, J., Meyer, C.B., Morris, S.B., Moy, K.R., O ’neill, P.L., Petkov, I., Redfern, S., Schucker, R., Sontag, M.A., Wang, J., Weiner, E. and Yachanin, A.S. 2016. 100% Clean and Renewable Wind, Water, and Sunlight (WWS) All- Sector Energy Roadmaps for 139 Countries of the World

Jänicke, M. 2008. Ecological modernisation: new perspectives. *Journal of Cleaner Production*. [Online]. **16**(5),pp.557–565. [Accessed 24 January 2019]. Available from: https://www.sciencedirect.com/science/article/pii/S0959652607000480.

Jänicke, M. 2020. Ecological Modernization – a Paradise of Feasibility but no General Solution *In*: L. Mez, L. Okamura and H. Weidner, eds. *The Ecological Modernization Capacity of Japan and Germany*. Wiesbaden: Springer Fachmedien Wiesbaden, pp. 13–23.

Jänicke, M. 1984. *Preventive environmental policy as ecological modernisation and structural policy*.

Jones, M.E. 1993. Origins of the East German Environmental Movement. *German Studies Review*. **16**(2),p.235.

Kartha, S., Kemp-benedict, E., Ghosh, E., Nazareth, A. and Gore, T. 2020. *The Carbon Inequality Era: An assessment of the global distribution of consumption emissions among individuals from 1990 to 2015 and beyond*.

Kay, S., Peuch, J. and Franco, J.C. 2015. Extent of farmland grabbing in the EU P. D. B. S. and C. Policies, ed. Available from: internal-pdf://245.131.99.226/Extent of farmland grabbing in th eu_EU PARL.pdf.

Kishimoto, S., Steinfort, L. and Petitjean, O. (eds.). 2020. *The future is public: Towards democratic ownership of public services*.

Klages, B. 2001. Die Privatisierung der ehemals volkseigenen landwirtschaftlichen Flächen in den neuen Bundesländern.

Knaebel, R. 2015. Des fermes d'Etat à l'agrobusiness; En Allemagne, main basse sur les terres de l'Est. *Le Monde Diplomatique*. (September).

Knaebel, R. and Rimbert, P. 2019. The economic Anschluss of the GDR. *Le Monde Diplomatique*. [Online]. (November). Available from: https://mondediplo.com/2019/11/06germany.

Kongstad, P. 1974. Growth poles and urbanization: a critique of Perroux and Friedman. *Antipode*. [Online]. **6**(2),pp.114–121. [Accessed 16 July 2020]. Available from: http://doi.wiley.com/10.1111/j.1467-8330.1974.tb00602.x.

Kosoy, N. and Corbera, E. 2010. Payments for ecosystem services as commodity fetishism. *Ecological Economics*. [Online]. **69**(6),pp.1228–1236. Available from: http://dx.doi.org/10.1016/j.ecolecon.2009.11.002.

Krause, F., Bossel, H., Müller-Reissmann, K.-F. and Öko-Institut (Freiburg im Breisgau, G. 1980. *Energie-Wende : Wachstum u. Wohlstand ohne Erdöl u. Uran : e. Alternativ-Bericht d. Öko-Inst., Freiburg* [Online]. Germany: S. Fischer. [Accessed 14 May 2020]. Available from: http://www2.hu-berlin.de/sachbuchforschung/CONTENT/SBDB/pix/PDF/Krause-Energie-Inhalt.pdf.

Krugman, P. 1998. What's new about the new economic geography? *Oxford Review of Economic Policy*. **14**(2),pp.7–17.

KTG Agrar 2012. KTG Agrar factsheet. . (Juli),pp.1–5. Available from: http://www.ktg-agrar.de/de/.

Küster, K. 2002. Die ostdeutschen Landwirte und die Wende die Entwicklung der ostdeutschen Landwirtschaftsstrukturen ab 1989 am Beispiel Thüringen - aus agrarsoziologischer Sicht.

Lacal-Arántegui, R. 2019. Globalization in the wind energy industry: contribution and

economic impact of European companies. *Renewable Energy*. **134**,pp.612–628.

Laclau, E. and Mouffe, C. 2014. *Hegemony and socialist strategy: Towards a radical democratic politics.* Verso Trade.

Lajdova, Z., Lajda, J. and Bielikv, P. 2016. The impact of the biogas industry on agricultural sector in germany. *Agricultural Economics*. **62**(1),pp.1–8.

Last, G. 2009. *After the 'Socialist Spring' - collectivisation and economic transformation in the gdr* [Online]. [Accessed 14 May 2020]. Available from: www.berghahnbooks.com.

Lefebvre, H. and Nicholson-Smith, D. 1991. *The production of space*. Oxford: Blackwell.

Lenin, V.I. 1999. *Imperialism: The highest stage of capitalism* [Online]. Resistance Books. Available from: internal-pdf://213.10.187.161/Imperialism-The-Highest-Stage-Of-Capitalism-A-.pdf.

Lenin, V.I. and Cox, D. 1911. Marxism and Nasha Zarya *In*: *Collected works of Lenin 20*.

Loske, R. and Bleischewitz, R. 1997. *Zukunftsfähiges Deutschland : ein Beitrag zu einer global nachhaltigen Entwicklung : Studie des Wuppertal-Instituts für Klima, Umwelt, Energie GmbH*. BUND.

Lumsden, S. 2016. Second Nature and Historical Change in Hegels Philosophy of History. *International Journal of Philosophical Studies*. [Online]. **24**(1),pp.74–94. Available from: http://dx.doi.org/10.1080/09672559.2015.1111920.

Lupo, S. 2005. *Il fascismo: la politica in un regime totalitario*. Feltrinelli.

Lupo, S. 2018. *La mafia. Centosessant'anni di storia* [Online]. Donzelli. [Accessed 21 July 2020]. Available from: https://www.ibs.it/mafia-centosessant-anni-di-storia-libro-salvatore-lupo/e/9788868438258?gclid=Cj0KCQjwpNr4BRDYARIsAADIx9wQtbDrCpUHo0IbAnuWZYEUmQKrGY4v0DKS0nRnVYz95whRp_dGnDoaAmISEALw_wcB.

Lupo, S. 1998. Storia del Mezzogiorno, questione meridionale, meridionalismo. *Meridiana*. [Online]. **32**(LUOGHI E IDENTITÀ),pp.17–52. [Accessed 14 February 2019]. Available from: http://www.rivistameridiana.it/files/Lupo,-Storia-del-Mezzogiorno.pdf.

Lutz, V. 1961. Alcuni aspetti strutturali del problema del mezzogiorno: la complementarietà dell'emigrazione e dell'industrializzazione. (Some structural aspects of the Southern problem: the complementarity of "emigration" and industrialisation) | LUTZ | Moneta e Credit. *Moneta e Credito*. [Online]. (56),p.407. [Accessed 15 July 2020]. Available from: https://ojs.uniroma1.it/index.php/monetaecredito/article/view/12380.

Luxemburg, R. 2015. *The Accumulation of Capital*. Routledge.

Machin, A. 2019. Changing the story? The discourse of ecological modernisation in the European Union. *Environmental Politics*. **28**(2),pp.208–227.

Maes, J., Teller, A., Erhard, M., Liquete, C., Braat, L., Berry, P., Egoh, B., Puydarrieus, P., Fiorina, C., Santos, F., Paracchini, M.L., Keune, H., Wittmer, H. and Hauck, J. 2013. *An analytical framework for ecosystem assessments under action 5 of the EU biodiversity strategy to 2020*.

Magnaghi, A. 2013. *Il progetto locale: verso la coscienza di luogo*. Bollati Boringhieri.

Magnaghi, A. 2007. Il territorio come sviluppo delle società locali. *Etica ed economia*. [Online]. **2**,pp.51–70. Available from: http://www.dea.univr.it/documenti/OccorrenzaIns/matdid/matdid250710.doc.

Malm, A. 2016. *Fossil capital: The rise of steam power and the roots of global warming*. Verso Books.

Malterud, K. 2001. Qualitative research: standards, challenges, and guidelines. *The lancet*. (358(9280)),pp.483–488.

Malthus, T.-R. 1827. *Definitions in Political Economy.-London, Murray 1827*. Murray.

Marrazzo, G. 2014. Terremoto sommerso. [Accessed 20 July 2020]. Available from: https://www.raicultura.it/storia/articoli/2019/01/Terremoto-sommerso-12f73385-ab18-4aa9-9cf9-aaad643c57b1.html.

Marshall, A. 2009. *Principles of Economics*. Cosimo Classics.

Martinez-Alier, J. 2002. The Environmentalism of the Poor *In*: *The Political Economy of Sustainable Development: Environmental Conflict, Participation and Movements*., pp.

225–239.

Marx, K. 1911. *A Contribution to the Critique of Political Economy*. CH Kerr.

Marx, K. 1976. *Capital: a critique of political economy, Vol. 1* (B. Fowkes & D. Fernback, eds.). London: Penguin Classics.

Marx, K. 1967. *Capital: a critique of political economy, Vol. 2*. Progress Publishers.

Marx, K. 1993. *Capital: a critique of political economy, Vol. 3* (B. Fowkes & E. MAndel, eds.). Penguin Classics.

Marx, K. 2009a. *Critique of the Gotha Programme*. Dodo Press.

Marx, K. 1959. *The Economic and Philosophical Manuscripts of 1844*. Progress Publishers.

Marx, K. 2009b. *The Eighteenth Brumaire of Louis Napoleon*. Dodo Press.

Marx, K. and Engels, F. 1970. *The German ideology. Vol. 1.* International Publishers Co.

Mayer, M. and Ely, J. (eds.). 1998. *The German Greens: Paradox between movement and party*. Philadelphia: TEmple University Press.

McAfee, K. 1999. Selling Nature to save It? Biodiversity and Green Developmentalism. *Environment and Planning D: Society and Space*. [Online]. **17**(2),pp.133–154. [Accessed 16 November 2017]. Available from: http://journals.sagepub.com/doi/10.1068/d170133.

McCarthy, J. 2015. A socioecological fix to capitalist crisis and climate change? The possibilities and limits of renewable energy. *Environment and Planning A*. **47**(12),pp.2485–2502.

McCarthy, J. and Thatcher, J. 2019. Visualizing new political ecologies: A critical data studies analysis of the World Bank's renewable energy resource mapping initiative. *Geoforum*. [Online]. **102**(October 2016),pp.242–254. Available from: https://doi.org/10.1016/j.geoforum.2017.03.025.

McGowan, F. 2011. Putting energy insecurity into historical context: European responses to the energy crises of the 1970s and 2000s. *Geopolitics*. **16**(3),pp.486–511.

McKenna, T. 2011. Hegelian dialectics. *Critique*. **39**(1),pp.155–172.

McMichael, P. 2009. The agrofuels project at large. *Critical Sociology*. [Online]. **35**,pp.825–839. Available from: internal-pdf://61.6.110.128/The agrufuel at large.pdf.

McMichael, P. 1994. *The global restructuring of agro-food systems*. Cornell University Press.

Meadows, D.H., Meadows, D.H., Randers, J. and Behrens III, W.W. 1972. *The limits to growth: a report to the club of Rome (1972)*. Universe Books, New York.

Mezzadra, S. and Neilson, B. 2017. On the multiple frontiers of extraction: excavating contemporary capitalism. *Cultural Studies*. **31**(2–3),pp.185–204.

Midttun, A. 1997. *European electricity systems in transition: a comparative analysis of policy and regulation in Western Europe*. Elsevier.

Midttun, A. and Koefoed, A.L. 2003. Greening of electricity in Europe: Challenges and developments. *Energy Policy*. **31**(7),pp.677–687.

Milder, S. 2013. The New Watch on the Rhine: Anti-Nuclear Protest in Baden and Alsace | Environment & Society Portal. [Accessed 14 May 2020]. Available from: http://www.environmentandsociety.org/arcadia/new-watch-rhine-anti-nuclear-protest-baden-and-alsace.

Ministry of Economic Development 2010. *Linee guida per l'autorizzazione degli impianti alimentati da fonti rinnovabili* [Online]. Ministero dello Sviluppo Economico. [Accessed 12 October 2020]. Available from: https://www.gazzettaufficiale.it/eli/id/2010/09/18/10A11230/sg.

Minsky, H.P. 1992. The financial instability hypothesis. *Levy Economics Institute Working Paper Collection*. (74),pp.6–8.

Mohai, P., Pellow, D. and Roberts, J.T. 2009. Environmental justice. *Annual Review of Environment and Resources*. **34**,pp.405–430.

Mol, A.P.J. and Jänicke, M. 2009. The origins and theoretical foundations of ecological modernisation theory *In*: A. P. J. Mol, D. A. Sonnenfeld and G. Spaargaren, eds. *The Ecological Modernisation Reader: Environmental Reform in Theory an Practice*

[Online]. Routledge, pp. 17–27. [Accessed 3 December 2020]. Available from: https://research.wur.nl/en/publications/the-origins-and-theoretical-foundations-of-ecological-modernisati.

Mol, A.P.J., Sonnenfeld, D.A. and Spaargaren, G. (eds.). 2009. *The Ecological Modernisation Reader: Environmental Reform in Theory an Practice*. Routledge.

Mol, A.P.J. and Spaargaren, G. 2000. Ecological modernisation theory in debate: A review. *Environmental Politics*. [Online]. **9**(1),pp.17–49. [Accessed 24 July 2019]. Available from: https://www.tandfonline.com/doi/full/10.1080/09644010008414511.

Moore, J.W. 2015. *Capitalism in the Web of Life: Ecology and the Accumulation of Capital*. Verso Books.

Moore, J.W. 2017. The Capitalocene, Part I: on the nature and origins of our ecological crisis. *Journal of Peasant Studies*. [Online]. **44**(3),pp.594–630. Available from: http://dx.doi.org/10.1080/03066150.2016.1235036.

Moore, J.W. 2018. The Capitalocene Part II: accumulation by appropriation and the centrality of unpaid work/energy. *Journal of Peasant Studies*. [Online]. **45**(2),pp.237–279. Available from: https://doi.org/10.1080/03066150.2016.1272587.

Müller, B. 2011. Fuest : Biogas plants in the old district of Lingen lead to " maizeing ".

Muncy, L.W. 1947. The Junkers and the Prussian Administration from 1918 to 1939. *The Review of Politics*. **9**(4),pp.482–501.

Negri, I. 1996. *La grande abbuffata: mani rapaci sull'Irpinia del terremoto.* [Online]. Tsunami. [Accessed 20 July 2020]. Available from: https://books.google.it/books?id=kM-RAAAAIAAJ&q=terremoto+irpinia&dq=terremoto+irpinia&hl=en&sa=X&ved=2ahUKEwie74mR0dvqAhXExaYKHfc-CmQQ6AEwAHoECAEQAg.

Neumann, F., Marcuse, H. and Kirchheimer, O. 2013. *Secret reports on Nazi Germany: The Frankfurt School contribution to the war effort*. Princeton University Press.

Nilsson, M. 2011. EU renewable energy policy: mixed emotions towards harmonization *In*: *Toward a Common European Union Energy Policy*. New York: Palgrave Macmillan, pp.

113–130.

Di Nolfo, E. 1994. *Storia delle Relazioni Internazionali: dal 1918-1992*. Laterza.

O'Connor, J. 1988. Capitalism, nature, socialism a theoretical introduction. *Capitalism Nature Socialism*. [Online]. **1**(1),pp.11–38. [Accessed 17 October 2017]. Available from: http://www.tandfonline.com/doi/abs/10.1080/10455758809358356.

O'Connor, J. 1998. *Natural causes: Essays in ecological Marxism*. Guilford Press.

Official Journal of the European Communities 1973. *Declaration of the Council of the European Communities and of the representatives of the governments of the member states meeting in the Council of 22 November 1973 on the Programme of Action of the European Communities on the environment*.

Official Journal of the European Communities 2019. *Directive (EU) 2019/944 of the European Parliament and of the council of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU (recast)*.

Official Journal of the European Communities 1993. *Resolution of the Council of the European Communities and of the representatives of the governments of the member states, meeting within the council, of 1 February 1993 on the continuation and implementation of a European Community of policy and action in*.

Official Journal of the European Communities 1983. *Resolution of the Council of the European Communities and of the representatives of the governments of the member states, meeting within the council, of 7 February 1983 on the continuation and implementation of a European Community policy and action progr*.

Official Journal of the European Communities 1987. *Resolution of the Council of the European Communities and of the representatives of the governments of the member states, meeting within the Council of 19 October 1987 on the continuation and implementation of a European Community policy and actio*.

Official Journal of the European Communities 1997. *Treaty of Amsterdam amending the treaty on European Union, the treaties establishing the European Communities and certain related acts*.

Official Journal of the European Communities 1992. *Treaty on European Union*.

Ojeda, D. 2012. Green pretexts: Ecotourism, neoliberal conservation and land grabbing in Tayrona National Natural Park, Colombia. *Journal of Peasant Studies*. [Online]. **39**(2),pp.357–375. Available from: http://dx.doi.org/10.1080/03066150.2012.658777.

Olson, A. and Jones, R. 2012. Chasing Grid Parity: Understanding the Dynamic Value of Renewable Energy. *Electricity Journal*. **25**(3),pp.17–27.

Paccino, D. 1980. *L'imbroglio ecologico: l'ideologia della natura*. Einaudi.

Panebianco, A. 1974. *Clientelismo e mutamento Politico* [Online] (L. Graziano, ed.). Franco Angeli. [Accessed 16 July 2020]. Available from: https://doi.org/10.1017/S0048840200014271.

Pellizzoni, L. 2014. Territorio e movimenti sociali. Continuità, innovazione o integrazione? *Poliarchie*. (2).

Peluso, N.L. and Vandergeest, P. 2001. Genealogies of the Political Forest and Customary Rights in Indonesia, Malaysia, and Thailand. *The Journal of Asian Studies*. **60**(3),pp.761–812.

Pfeiffer, D. and Thrän, D. 2018. One Century of Bioenergy in Germany: Wildcard and Advanced Technology. *Chemie Ingenieur Technik*. [Online]. **90**(11),pp.1676–1698. [Accessed 5 December 2019]. Available from: http://doi.wiley.com/10.1002/cite.201800154.

Pigou, A.C. 2013. *The economics of welfare*. Palgrave Macmillan.

van der Ploeg, J.D., Franco, J.C. and Borras, S.M. 2015. Land concentration and land grabbing in Europe: a preliminary analysis. *Canadian Journal of Development Studies / Revue canadienne d'études du développement*. **36.2**,pp.147–162.

Podda, C. 2020. La disciplina del subappalto dopo la "sentenza tedeschi": illegittima anche la disposizione che limita al 20 % la possibilità di ribassare i prezzi. *DPCE Online*. [Online]. **42**(1). Available from: http://www.dpceonline.it/index.php/dpceonline/article/view/943.

Pollitt, M.G. 2019. The European Single Market in Electricity: An Economic Assessment. *Review of Industrial Organization*. [Online]. **55**(1),pp.63–87. Available from: https://doi.org/10.1007/s11151-019-09682-w.

Pollitt, M.G. 2012. The role of policy in energy transitions: Lessons from the energy liberalisation era. *Energy Policy*. [Online]. **50**,pp.128–137. Available from: http://dx.doi.org/10.1016/j.enpol.2012.03.004.

Porter, M.E. 2001. he value chain and competitive advantage *In*: Da. Barnes, ed. *nderstanding business processes 2*. London: Routledge.

Potter, W.J. and Levine-Donnerstein, D. 1999. Rethinking validity and reliability in content analysis. *https://www.tandfonline.com/toc/rjac20/current*. (3),pp.258–284.

Povellato, A. and Tantari, A. 2017. *Indagine Sul Mercato Fondiario in Italia*.

Prasad, S. and Ingle, A.P. 2019. Impacts of sustainable biofuels production from biomass *In*: *Sustainable Bioenergy: Advances and Impacts*. Elsevier, pp. 327–346.

Procopio, G., Trotta, A., Strano, E. and Iannuzzi, A.P. 2020. Green Banking in Italy: Current and Future Challenges *In*: Palgrave Macmillan, Cham, pp. 205–258. [Accessed 8 October 2020]. Available from: http://link.springer.com/10.1007/978-3-030-40248-8_9.

Pugliese, E. 1995. Gli squilibri del mercato del lavoro *In*: F. Barbagallo, ed. *Storia dell'Italia repubblicana 2.1*. Einaudi.

Raffestin, C. 2019. *Pour une géographie du pouvoir*. ENS Éditions.

Rasmussen, M.B. and Lund, C. 2018. Reconfiguring Frontier Spaces: The territorialization of resource control. *World Development*. **101**.

RAT Campania 2018. *Sentenza TAR Campania N. 07145/2018*.

Regione Campania 2004. *Legge Regionale 16/04*.

REN21 2020. *Renewables 2020 Global Status Report* [Online]. Available from: https://abdn.pure.elsevier.com/en/en/researchoutput/ren21(5d1212f6-d863-45f7-8979-5f68a61e380e).html.

Ricardo, D. 1891. *On the principles of political economy, and taxation*. G. Bell and sons.

Rice, J. 2007. Ecological unequal exchange: Consumption, equity, and unsustainable structural relationships within the global economy. *International Journal of Comparative Sociology*. **48**(1),pp.43–72.

Romano, S.F. 1959. *Storia dei fasci siciliani*. Laterza.

De Rosa, S.P. 2018. A political geography of 'waste wars' in Campania (Italy): Competing territorialisations and socio-environmental conflicts. *Political Geography*. [Online]. **67**(September),pp.46–55. Available from: https://doi.org/10.1016/j.polgeo.2018.09.009.

Rosenbaum, W.;, Mautz, R.; and Byzio, A. 2005. *Die soziale Dynamik der regenerativen Energien-am Beispiel der Fotovoltaik, der Biogasverstromung und der Windenergie* [Online]. [Accessed 14 May 2020]. Available from: www.ssoar.info.

Routledge, P., Cumbers, A. and Derickson, K.D. 2018. States of just transition: Realising climate justice through and against the state. *Geoforum*. [Online]. **88**(December 2017),pp.78–86. Available from: https://doi.org/10.1016/j.geoforum.2017.11.015.

Rubin, H.J. and Rubin, I.S. 2011. *Qualitative interviewing: The art of hearing data*. SAGE.

Rucht, D. and Roose, J. 1999. The German environmental movement at a crossroads? *Environmental Politics*. **8**(1),pp.59–80.

Rudolph, D. and Kirkegaard, J.K. 2019. Making Space for Wind Farms: Practices of Territorial Stigmatisation in Rural Denmark. *Antipode*. **51**(2),pp.642–663.

Rutherford, S. 2017. Environmentality and Green Governmentality. *International Encyclopedia of Geography: People, the Earth, Environment and Technology*. (January),pp.1–5.

Saitta, P. 2009. *Spazi E Societt a Rischio. Ecologia, Petrolio E Mutamento a Gela (Spaces and Society at Risk. Ecology, Oil and Social Change in Gela)*. think thanks edizioni.

dos Santos, T. 1968. *El nuevo carácter de la dependencia*. Centro de Estudios Socio-Económicos, Universidad de Chile.

Sartori, N. 2017. Il contributo unificato quale costo fiscale di accesso alla giustizia. . (4),pp.1010–1038.

Sassen, S. 2013. Land Grabs Today: Feeding the Disassembling of National Territory. *Globalizations*. [Online]. **10**,pp.25–46. Available from: internal-pdf://164.45.154.6/Land Grabs Today Feeding the Disassembling of.pdf.

Sassen, S. 2008. *Territory, authority, rights: From medieval to global assemblages*. Princeton University Press.

Scheffer, K. 2005. Konzepte für den Anbau und die energetische Nutzung landwirtschaftlicher Kulturpflanzen. Beitrag zum Internetportal „Vom Landwirt zum Energiewirt “.

Schneider, J. and Schneider, P. 2011. The Mafia and Capitalism. An Emerging Paradigm. *Sociologica*. [Online]. **2**,pp.1–23. Available from: http://www.sociologica.mulino.it/doi/10.2383/35873.

Schumacher, E.F. 1973. *Small is beautiful: a study of economics as if people really mattered*. Blond & Briggs.

Scotti, I. 2020. *Vento forte. Eolico e professioni della green economy* [Online]. Napoli-Salerno: Orthotes. [Accessed 8 October 2020]. Available from: https://www.orthotes.com/eolico/.

Segato, L., Mignone, M., Scioneri, V., Putaturo, C., del Monte, D., di Maria, E., Simonaggio, I., Berrini, M., Ruberto, G. and Sacco, G. 2013. *Corruzione E Green Economy*.

Della Seta, R. 2000. *La difesa dell'ambiente in Italia: storia e cultura del movimento ecologista*.

Shandro, A. 2014. *Lenin and the logic of hegemony: Political practice*. Brill.

Siamanta, Z.C. 2017. Building a green economy of low carbon : the Greek post-crisis experience of photovoltaics and financial ' green grabbing '. *Journal of Political Ecology*. **24**,pp.258–276.

Siamanta, Z.C. 2019. Wind parks in post-crisis Greece: Neoliberalisation vis-à-vis green grabbing. *Environment and Planning E: Nature and Space*. **2**(2),pp.274–303.

Silverman, D. 2013. *Doing qualitative research: A practical handbook*. SAGE Publications Ltd.

Singer, H.W. 1950. American Economic Association The Distribution of Gains between Investing and Borrowing Countries Author (s): H . W . Singer Source : The American Economic Review , Vol . 40 , No . 2 , Papers and Proceedings of the Sixty-second Annual Meeting of the Ame. *The American Economic Review*. **40**(2),pp.473–485.

Sivaramakrishnan, K. 1197. A limited forest conservancy in southwest Bengal, 1864–1912. *The Journal of Asian Studies*. **56**(1).

Skjærseth, J.B. 1994. The climate policy of the EC: too hot to handle. *J. Common Mkt. Stud.* (32),p.26.

Smil, V. 2008. *Energy in nature and society: general energetics of complex systems*. MIT press.

Smil, V. 2015. *Power density: a key to understanding energy sources and uses*. MIT Press.

Smith, A. 2010. *An Inquiry into the Nature and Causes of the Wealth of Nations*. Harriman House Limited.

Smith, N. 2008. *Uneven development: Nature, capital, and the production of space*. University of Georgia Press.

Solorio, I. and Bocquillon, P. 2017. EU renewable energy policy: A brief overview of its history and evolution *In*: *A Guide to EU Renewable Energy Policy*.

Solorio, I. and Fernandez, R. 2017. Spain and renewable energy promotion: Europeanization upside dow *In*: *A Guide to EU Renewable Energy Policy*. Edward Elgar Publishing.

Solorio, I. and Morata, F. 2012. Introduction: the re-evolution of energy policy in Europe *In*: *European energy policy: An environmental approach*. Edward Elgar Publishing, pp. 1–22.

Solow, R.M. 1986. On the intergenerational allocation of natural resources. *The Scandinavian Journal of Economics*.,pp.141–149.

Solow, R.M. 1974. The economics of resources or the resources of economics. *Discounting and Environmental Policy*. **64**(2),pp.165–178.

Sonnino, E. 1995. La popolazione italiana dall'espansione al contenimento *In*: F. Barbagallo, ed. *Storia dell'Italia repubblicana 2.1*. Einaudi.

Spaargaren, G. and Mol, A.P.J. 1992. Sociology, environment, and modernity: Ecological modernization as a theory of social change. *Society and Natural Resources*. **5**(4),pp.323–344.

Stefan-Sorin, M. 2014. *Social Market Economy. The Case of Germany*. Springer Nature.

Steiner, P. 2003. Physiocracy and French pre-classical political economy *In*: J. S. Warren, J. E. Biddle and J. B. Davis, eds. *A Companion to the History of Economic Thought*. Blackwell Publishing Ltd.

Stephens, J.C., Burke, M.J., Gibian, B., Jordi, E. and Watts, R. 2013. Operationalizing Energy Democracy: Challenges and Opportunities in Vermont's Renewable Energy Transformation. *Frontiers in Communication*. (3),p.43.

Streith, M. 2011. Back to the Future. The First Years of the Post-Socialist Agricultural Transition in the Ex-GDR. *Économie rurale*. [Online]. (5),pp.85–99. [Accessed 15 May 2020]. Available from: https://www.cairn-int.info/article-E_ECRU_325_0085--back-to-the-future-the-first-years-of.htm.

Streule, M. and Schwarz, A. 2019. Not all spaces are territories: Creating other possible urban worlds in and from Latin America-an interview with Raúl Zibechi. *Geographica Helvetica*. **74**(1),pp.105–111.

Sullivan, S. 2017. What's ontology got to do with it? Nature, knowledge and 'the green economy'. *Journal of Political Ecology*. **24**,pp.217–242.

Susskind, L.E. and Ali, S.H. 2014. *Environmental diplomacy: Negotiating more effective global agreements*. Oxford: Oxford University.

Svampa, M. 2015. Commodities consensus: Neoextractivism and enclosure of the commons in Latin America. *South Atlantic Quarterly*. **114**(1),pp.65–82.

SVIMEZ (ed.). 2016. *La dinamica economica del mezzogiorno dal secondo dopoguerra*

[Online]. Il Mulino. [Accessed 15 July 2020]. Available from: https://sites.google.com/site/otuapbowfaredpi/la-dinamica-economica-del-mezzogiorno-dal-secondo-dopoguerra-pdf.

Sweezy, P.M. 1968. *Theory of capital development*. NYU Press.

Taylor, A.J.P. 2001. *The course of German history : a survey of the development of German history since 1815*. Routledge.

TEEB 2008. *TEEB Interim Report*.

TERNA 2018. *Statistiche Regionali 2018*.

Theuerl, S., Herrmann, C., Heiermann, M., Grundmann, P., Landwehr, N., Kreidenweis, U. and Prochnow, A. 2019. The future agricultural biogas plant in Germany: A vision. *Energies*. [Online]. **12**(3). [Accessed 5 December 2019]. Available from: https://www.mdpi.com/1996-1073/12/3/396.

Thrän, D., Schaubach, K., Majer, S. and Horschig, T. 2020. Governance of sustainability in the German biogas sector—adaptive management of the Renewable Energy Act between agriculture and the energy sector. *Energy, Sustainability and Society*. **10**(1).

Tietz, A. 2017. *Überregional aktive Kapitaleigentümer in ostdeutschen Agrarunternehmen: Entwicklungen bis 2017*. Thünen Institute.

Tilly, C. 1985. War making and state making as organized crime *In*: P. Evans, D. Rueschemeyer and T. Skocpol, eds. *Bringing the State Back in*. Cambridge: Cambridge University Press.

Toke, D. 2011. *Ecological modernisation and renewable energy*. Springer.

Tronti, M. 2013. *Operai e capitale*. DeriveApprodi.

Uekötter, F. 2014. The greenest nation?: A new history of German environmentalism.

Ulrich, P. and Lehr, U. 2018. *Erneuerbar beschäftigt in den Bundesländern: Bericht zur aktualisierten Abschätzung der Bruttobeschäftigung 2016 in den Bundesländern* [Online]. [Accessed 15 May 2020]. Available from: https://www.econstor.eu/handle/10419/184702.

UN 1997. Glossary of Environment Statistics, Studies in Methods. Available from: internal-pdf://88.240.24.41/SeriesF_67E.pdf.

UN 1993. Integrated environmental and economic accounting.

UN 2003. Integrated environmental and economic accounting.

UN 2014. *System of Environmental-Economic Accounting 2012 - Central framework*.

UN, EU, FAO, OECD and World Bank 2014. *System of Environmental-Economic Accounting 2012*.

Della Valentina, G. 2011. *Storia dell'ambientalismo in Italia: lo sviluppo insostenibile*. Bruno Mondadori.

Vandergeest, P. and Peluso, N.L. 1995. Territorialization and state power in Thailand. *Theory and Society*. **24**(3),pp.385–426.

Varese, F. 2011. Global Crime Mafia movements: a framework for understanding the mobility of mafia groups. *Taylor & Francis*. [Online]. **12**(3),pp.218–231. [Accessed 27 July 2020]. Available from: https://www.tandfonline.com/action/journalInformation?journalCode=fglc20.

Vidal, J. 2008. The great green land grab. *The Guardian*. [Online]. Available from: internal-pdf://5.45.110.202/John Vidal on the great green land grab _ Envi.pdf.

Vogelpohl, T., Ohlhorst, D., Bechberger, M. and Hirschl, B. 2017. German renewable energy policy: independent pioneering versus creeping Europeanization? *In*: *A Guide to EU Renewable Energy Policy*. Edward Elgar Publishing.

Walker, E.T. 2009. Privatizing Participation: Civic Change and the Organizational Dynamics of Grassroots Lobbying Firms. *American Sociological Review*. [Online]. **74**(1),pp.83–105. [Accessed 12 October 2020]. Available from: http://journals.sagepub.com/doi/10.1177/000312240907400105.

Wallerstein, I. 2004a. *World-systems analysis : an introduction*. Duke University Press.

Wallerstein, I. 2004b. *World-systems Analysis: An Introduction*. Duke University Press.

Weber, A. 1993. From compulsory collectivization, expropriation, expulsion to specialized

Agricultural Producers' Co-operatives. Historical aspects of GDR agriculture. *agris.fao.org*. [Online]. [Accessed 14 May 2020]. Available from: http://agris.fao.org/agris-search/search.do?recordID=DE9342109.

Westman, W.E. 1977. How Much Are Nature's Services Worth? *American Association for the Advancement of Science*. **197**(4307),pp.960–964.

Whaples, R. and Parker, R.E. (eds.). 2013. *Routledge handbook of modern economic history*. Routledge.

White, B. and Dasgupta, A. 2010. Agrofuels capitalism: a view from political economy. *The Journal of peasant studies*. [Online]. **37**(4),pp.593–607. Available from: internal-pdf://173.47.24.193/Agrofuels capitalism a view from political eco.pdf.

WindEurope 2018. *2018 Financing and investment trends* [Online]. Available from: https://windeurope.org/wp-content/uploads/files/about-wind/reports/Financing-and-Investment-Trends-2018.pdf.

Ye, J., van der Ploeg, J.D., Schneider, S. and Shanin, T. 2020. The incursions of extractivism: moving from dispersed places to global capitalism. *Journal of Peasant Studies*. [Online]. **47**(1),pp.155–183. Available from: https://doi.org/10.1080/03066150.2018.1559834.

Yenneti, K., Day, R. and Golubchikov, O. 2016. Spatial justice and the land politics of renewables: Dispossessing vulnerable communities through solar energy mega-projects. *Geoforum*.

Zaccaria, A.M. 2015. Dentro il cratere. Il terremoto del 1980 nella memoria dei sindaci. *L'Italia e le sue RL'Italia e le sue regioni (1945-2011)*. [Online],p.431. [Accessed 26 February 2019]. Available from: http://www.treccani.it/enciclopedia/dentro-il-cratere-il-terremoto-del-1980-nella-memoria-dei-sindaci_%28L%27Italia-e-le-sue-Regioni%29/.

Zeh, J. 2016. *Unterleuten: roman*. Luchterhand Literaturverlag.

Zinke, O. 2019. Agrarstruktur: Von Heuschrecken und Großbetrieben. Available from: https://www.agrarheute.com/management/betriebsfuehrung/agrarstruktur-

heuschrecken-grossbetrieben-560921.

Zitara, N. 1974. *L'unità d'Italia: nascita di una colonia* [Online]. Jaca book. [Accessed 14 February 2019]. Available from: https://www.librerianeapolis.it/libri-84159/36-borbone/3893-l-unita-d-italia-nascita-di-una-colonia-nicola-zitara.