Energy [in]Justice in México

An analysis of wind and solar energy projects in Yucatán

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This doctoral thesis is dedicated to all the communities and individuals who advance their sense of autonomy and dignity in the face of immense political and economic forces that condition and enclose their lives.

Abstract

Systems for the generation, distribution and consumption of energy are subject to technological and institutional change. This is considered imperative, (1) to ameliorate climate change impacts by reducing CO_2 emissions from the current fossil fuel-based energy system and (2) to anticipate the foreseen depletion of natural resources and growing energy demands. Historically, the benefits and burdens of energy systems are distributed unevenly. Most research on wind and solar energy focuses on the potential to address issues of ecological degradation and ameliorate the impacts of climate change. However, as this thesis will show, there are structural problems associated with wind and solar energy development and deployment tied to centuries-old patterns. This thesis focuses on the impacts of wind and solar developments on local communities in Yucatán, México. It utilises the energy justice framework as an analytical tool to examine how the rapid approval and development of renewable energy—predominantly located on indigenous land—might drive the procedural, distribution and recognition of injustices in Yucatán. In doing so, this research uses qualitative methods that combine semi-structured interviews and participatory and non-participatory observation. This enables an understanding of how energy policies overlook the impacts of renewable energy developments on host communities. The research provides insights into how a just energy transition could be shaped – one that is informed by current needs and considers the preferences and livelihood characteristics of the inhabitants of Yucatán.

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Declaration

I declare that this thesis is a presentation of original work and I am the sole author. This work has not previously been presented for an award at this, or any other, University. All sources are acknowledged as References.

Chapter 1: Introduction

> “They want to steal our land, they are dividing our community, they want to get richer and richer at our expense, they pretend those big projects are the solution to the environmental crisis, they think they can fool us but we know our territory better, we are resisting and we will always be…”

There were the words of an indigenous woman that constantly resonated during the writing of this doctoral thesis.

I arrived early to a community member´s meeting about proposed renewable energy developments (wind and solar) in the region that were causing contestation. Pedro, my first in-field interviewee and one of the indigenous leaders in Yucatán, had invited me to this meeting right after I interviewed him, noting the focus of the meeting would be “sharing the struggles of our communities”. I unsuccessfully tried to find Pedro, my first in-field interviewee and one of the indigenous leaders in Yucatán, but as a ‘new face’ all eyes were on me. After I introduced myself, the immediate first question was “where are you from?” When they heard I was from Yucatán, the tension ended, hinting at the mistrust indigenous people often have of “outsiders”.

There were more than 20 indigenous attendees from different rural towns, four local scholars, and myself. Some of them were terrified about the deforestation of thousands of hectares to install solar panels, others looked skeptical on the design of wind projects arguing “how [will] those heavy tubes will be installed above our cenotes [natural deep-water wells]?”, another one pointed out “what would happen in hurricane season? The wind would tear apart those big metal structures and it would destroy our houses”. All of them were worried about losing their land. At the end of the meeting, one community member said:

> “We have each other, this is what this meeting is all about, how are we going to organise ourselves to protect our land, the future of our kids? We will resist”.

At the time of writing, those and other community members have indeed resisted. As a result, many wind and solar projects in Yucatán are facing lawsuits. This

doctoral thesis deals with the conflicts and complications generated by the arrival of large-scale solar and wind projects in Yucatán, México, and the response of those living there.

The timeframe of this doctoral thesis is between 2016 and 2018. More specifically, the energy policies analysed here derived from the Energy Reform published by the ex-president Enrique Peña Nieto in 2013. Whilst significant policy initiatives have occurred post 2018 under the administration of Andrés Manuel López Obrador (AMLO), such developments are beyond the scope of this analysis. However, it is worth mentioning that since December 20118 with the new government of Mexico headed by AMLO, and a shift to the political left, a new energy policy has been adopted in Mexico. This new policy included implementing profound changes in the trajectory of shifting back to investment in fossil fuel energy sources. For example, the Mexican Government recently invested US$9.1 billion in the oil refinery Dos Bocas (Ibarzábal and Bonilla, 2020). In addition, this thesis acknowledges that there are different types of renewable energy in Mexico such as geothermal, hydropower and bioenergy. However, the focus of this study is on solar and wind energy projects, due to these two sources being focused on, by way of the national auctions, for development in Yucatan.

The drive to build wind and solar farms in México and other areas emerges along with international concerns about anthropogenic climate change. Wind and solar energy have become important elements of green economies and a cornerstone of climate change mitigation, with calls from the United Nations Framework Convention on Climate Change (UNFCCC) to “accelerate the deployment of all renewable technologies" (UNFCCC, 2012, p. 22). México’s countrywide trajectory to increase wind and solar developments started with the General Law of Climate Change (LGCC), a national law, institutionally and normatively that supports and mandates the diversification of renewable or clean energy.

The Energy Reform was approved in 2013, 21 secondary laws were enacted, 15 existing laws were amended and six new laws were legislated (ETL, 2015). Whilst ensuring the continued state control and ownership of México’s

hydrocarbon and electricity assets, this reform introduced major structural changes throughout the energy industry—namely the establishment of new regimes, rules and institutions—and more importantly, to this research, allowing greater participation of the private sector in wind and solar energy generation, which in turn, I argue, has exacerbated and created new injustices on a scale hitherto not seen even in Oaxaca, México.

In this work, I argue that the development and deployment of renewable energy in México has brought more dis-benefits than benefits. Indeed, there is already a substantial and growing literature on the development and deployment of large-scale wind projects in the southern state of Oaxaca, México (Howe and Boyer, 2015; Howe, Boyer and Barrera, 2015; Dunlap, 2016; Sanchez, 2016), one of the first regions to see large renewables installations. The literature documents a range of socio-ecological conflicts, justice issues, and forms of dissent. Some of these issues have spread to the nearby state of Yucatán, following the enactment of the Energy Reform in 2013 (a new legal framework which accelerated the liberalisation of México´s energy production and distribution, and aimed to support the deployment of more renewable energy developments).

Under this new legal framework, México adopted ambitious environmental policies, namely with a goal of increasing 35% of renewable energy generation by 2024 (ETL, 2015). The market-driven mechanism adopted to boost renewable energy generation in the energy mix is through national auctions. In March 2016 the first long-term auction took place with 69 bidders participating, far exceeding the government's expectations. The winning companies, largely foreign firms, included: the US-based SunPower, Italy's Enel and China's Jinko Solar for energy proposals and Energia Renovable *de la Peninsula* for México wind and solar proposals (Jimenez, 2016). México's second electricity auctions were also dominated by solar and wind projects. The auction awarded contracts to 23 bidders out of 57 participants. The winning bids were awarded to firms from 11 countries, including Spain's Acciona Energia, France's *Engine* and México's IEnova (Ola, 2016). In 2016, 9 out of the 18 winning contracts in the first national auction of renewable energy projects were awarded to mostly foreign

developers, responding to factors such as generation costs and deficit of electricity production in the wider Yucatán Peninsula (James, 2017).

In this work, I argue that the development and deployment of renewable energy in Mexico has brought more dis-benefits than benefits. Indeed, there is already a substantial and growing literature on the development and deployment of large-scale wind projects in the southern state of Oaxaca, Mexico (Howe and Boye, 2015; Howe et al., 2015; Dunlap, 2016; Sánchez, 2016). The literature documents a range of socio-ecological conflicts, justices' issues, and forms of dissent. Some of these issues have spread to the nearby state of Yucatan, following the enactment of the Energy Reform in 2013.

Wind and solar energy have the potential to address issues of ecological degradation and rising carbon emissions and contribute towards climate change mitigation (Owusu and Asumadu-Sarkodie, 2016). As I will show, however, there are structural problems associated with wind and solar energy development in México, with deployment tied to centuries-old inequitable development patterns. Some of these issues are being highlighted by indigenous groups resisting wind and solar developments on their land and territory, raising problems of industrial development, human rights violations and injustices. To highlight this resistance is not to ignore the reality that some locals embrace and work with solar and wind developers. In fact, local elites, politicians and some landowners are actively lobbying for wind and solar developments. This has led to divisions within villages and families that further exacerbate conflicts. I will argue further, however, that the issue of the deployment of solar and wind technology taking place in Yucatán is an unjust process that consolidates industrial development, damaging livelihoods, cultures and ecosystems.

Although wind and solar accounted for only 5% of electricity generation worldwide in 2017, it is expected that these energy technologies will produce more than a third of the global electricity by 2040 (EIA, 2017). In many developing countries, especially in Africa and South and Southeast Asia, but also in parts of Latin America, renewable energy enables to supply electricity to

isolated communities through off-grid and islanded systems, thereupon improving access to basic services (Brent and Rogers, 2010; Palit and Chaurey, 2011; Robles-Quirapas *et al.*, 2015). In addition, it contributes to reduce the gender gap by decreasing time and labour burdens, improving their health as well as helping to eliminate discrimination against them (Johnson et al., 2019; Phillips, 2020). However, as I will argue, both wind and solar projects are not inherently just and as such, developments need to be examined critically and carefully. In this sense, this research is novel because (1) it analyses the deployment of solar and wind projects under a complete restructuring of the energy sector in Mexico; (2) this research integrates a power dynamics analysis within energy developments in an ongoing energy transition and (3) it offers insights regarding energy justice in a multicultural context such as the state of Yucatan, Mexico.

1.1 Scope of the study

This thesis acknowledges that there is not a single, agreed on definition of what an energy system entails. However, a common consensus is that an energy system describes a particular production, distribution and consumption of energy (Fouquet, 2010). This research builds on the strand of literature focused on energy transitions in terms of the changes in practices by actors in the energy system and the resulting outcomes, which in turn are mainly shaped by the rules and incentives that the governing institutions of the energy system generate (Kuzemko *et al.*, 2016).

In particular, this research considers technologies not simply as material objects, but as integrated components of sociotechnical systems, where producers, consumers, infrastructure users, regulators and other intermediaries are intertwined (Elzen and Wieczorek, 2005). This thesis is focused on wind and solar energy, which are analysed as renewable energy technologies—not simply as a series of engineering devices producing energy conversions—but as

configurations of factors including the social, technical, geographical, political, economic and cultural, among others, that have contingently arisen in particular contexts and that reflect social, economic relationships and processes, and more complex phenomena (Shove and Walker, 2007).

This research analyses the energy justice framework. This analytical framework allows for the critical exploration of the development and deployment of solar and wind energy projects through using the conceptual lenses of distributional justice, recognition of justice and procedural justice. The latter is linked to participatory processes in which participation entails contributing, sharing, influencing or redistributing power and control, benefits, knowledge and resources, through beneficiary involvement in decision making (Korten 1980; Paul 1987; Ghai and de Alacantara 1990). The concept of participation is also defined as a voluntary process by which people, including more marginalised social groups influence and/or control the decisions that affect them (Narayan, 1995). Additionally, this research analyses the energy justice framework. However, an in-depth analysis of what *justice* entails is beyond the scope of this study. Such type of analysis within energy justice can be found in Wood and Roelich (2020).

Adopting a national perspective on sustainable energy transitions requires the examination of political and economic dynamics behind national energy policies, including the process of negotiating and interacting between a variety of state and non-state actors in policy making (Knill et al., 2012). In other words, policies surrounding sustainable energy transitions comprise the contested processes through which policy goals and instruments are formulated and modified. However, these types of analyses tend to overlook the direct impacts of such policies on host communities. This research seeks to analyse an ongoing energy transition from the perspective of those who are directly impacted by national energy policies in México. This offers an alternative investigation into energy systems that goes beyond analysing policies. This research also responds to calls to include more empirical evidence from developing countries on how to deliver energy transitions, with special attention to social energy justice impacts (Lacey-Barnacle, Robison and Foulds, 2020).

1.2 Structure of the Thesis

The goal of this doctoral thesis is to understand how proposed large-scale solar and wind developments impact the everyday lived realities of those living in the identified territories. To the best of my knowledge, there is no case study from Yucatan assessing such developments from an energy justice and a power dynamics analysis, this research aims to fill such gaps. In the following chapter I will review the current literature with an in-depth examination of the theoretical underpinnings of energy justice around the world, before focusing mainly on case study countries with upper and lower-middle income. I will discuss success factors, challenges, and the potential role of energy justice in achieving a just energy transition for all. In Chapter 3 I outline the methodology and methods used to analyse the impacts of the deployment of solar and wind developments at a local scale. I lay out the research design, including the data collection tools and methods for data analysis. Then, in Chapter 4, I provide a background on the case study site in México, including demographics and the energy sector in Yucatán.

The results and findings of the research are covered in three chapters: In Chapter 5, I will argue that the participatory mechanisms involved in the deployment of solar and wind projects often overlook indigenous rights. I will outline how the consultation process is used to undermine indigenous autonomy, reinforcing a context of considerable political and economic asymmetry between state, industry representatives and elite interests and indigenous landowners. Such consultations reinforce state power whilst serving as a legitimizing platform for wind and solar developments, and create an illusion of dialogue, balanced negotiation and democratic decision-making.

In Chapter 6 I will focus on perceptions of wind and solar developments from key international, national and local actors involved regarding distributional justice, as well as the instrumental governance tools used to deploy them. I will attempt to describe the challenging path towards a low carbon future in México. This

includes exploring how renewable energy projects are distributed and the interplay between government, project developers, civil society organizations and members of host communities throughout Yucatán. Then, I analyse how such developments are contravening indigenous rights as well as failing in their “goal” to ameliorate climate change impacts.

In Chapter 7, I analyse the experience of residents in Yucatán who felt there was no social or collective benefit from the solar and wind projects except for the landowners and political authorities. Instead of social benefits, the solar and wind energy projects brought discomfort to those living close to such developments and increased social divisions. I argue that solar and wind energy in Yucatán furthers industrial economic processes of “grabbing” indigenous land and exposing people to the subsequent social and environmental impacts that threaten local livelihoods and cultural values.

Drawing on learnings from the empirical chapters mentioned above and critically analysing them against the literature, a concluding chapter reflects on the narratives emerging from the analysis of chapters 5-7 and presents a summary of the key contributions of this thesis and recommendations for policy, industry and future research.

Chapter 2: Theoretical Underpinnings

2.1 Introduction

Energy justice literature sits within a wider body of work on social science studies of energy, which also includes work on energy for development, energy transitions, studies of energy boomtowns and extractive industries. However, the strand I will draw on centrally, is the triumvirate of tenets – procedural justice, distributional justice and recognition of justice- which emerged in recent years (McCauley *et al.*, 2013). The purpose of this chapter is to outline the theoretical and conceptual framework developed for critically analysing solar and wind energy developments in the upper and lower-middle income countries.

This thesis has created a conceptual synthesis largely drawn upon the growing body of energy justice literature. What energy justice is, why it is an analytically robust framework, and how it has been operationalized in this thesis, will be thoroughly outlined, together with flaws, limitations and gaps. One of the novelties of this research lies in the use of the power cube within the energy justice framework applied to a case study framed in a turning point of the energy sector in Mexico. Including the power cube allows to examine how power flows within different spaces of participation regarding energy developments and the complexity around such projects in indigenous land.

In line with the recent literature on energy justice, this chapter shows that such analytical lenses can be used as a tool to analyse energy policies and their impacts on local communities' host to large-scale solar and wind projects. The chapter, therefore, discusses the conceptualization of energy justice and how it is used to explore case studies. To do so, the chapter consists of two main parts: the first part of this chapter explores the many conceptualizations of energy justice by scholars. In addition, it makes a case for the need to use analytical tools from notions of justice within energy studies. The second part of this chapter focuses on the three tenets of energy justice as well as discusses limitations of this framework, before stating more formally than the previous chapter, the aims and objectives of the thesis.

2.2 Conceptualization of energy justice

As previously highlighted, historically, the benefits and burdens of energy systems are distributed unevenly (Laird, 2013; Jenkins *et al.*, 2016). Systems for the production, distribution and consumption of energy are subject to technological and institutional change, due to concerns about climate change and the depletion of fossil fuel energy sources.

Such technological and institutional change represents enormous challenges for governments, industry and societies. Undoubtedly, there is an imperative to join global efforts to mitigate climate change impacts within energy systems. As such, some governments and organisations worldwide are opting for low-carbon technologies such as wind and solar farms. Renewable energy developments appear to be most efficient and effective solutions (Outka, 2021) in helping to achieve the most urgent global challenges such as poverty, energy security and climate change for the benefit of future generations because they are seen as a silver bullet to overcome inherent inequalities of the fossil fuels energy system (Villavicencio Calzadilla, and Mauger, 2017; IPCC, 2018).

However, renewable energy developments have also been linked to negative social and environmental impacts. For example, for many years researchers have explored the adverse impacts of large-scale renewable energy infrastructure, such as hydropower dams (Sieder, 2015; Siciliano *et al.*, 2018) and large-scale wind parks on communities, indigenous people and the environment (Del Rio and Burguillo, 2009; Baker, 2014; Avila-Calero, 2017; Siamanta and Dunlap, 2019).

While a vast majority of studies focus on the economic and technical factors related to wind and solar energy projects (Hasan and Power, 2011; Ataei *et al.*, 2015; Chen *et al.*, 2017; León-Vargas et al., 2019), the social risks and justice concerns associated with them have received little scholarly attention in

comparison, especially in upper and lower-middle income countries (Howe and Boyer, 2015; Yenneti and Day, 2015, 2016; Baker, 2016; Yenneti et al., 2016).

Whilst large-scale solar and wind energy projects do not emit as much carbon emissions as fossil fuel developments, it is important to highlight that it cannot be assumed *a priori* such types of technologies are just and will not simply replicate fossil-fuel inequalities (Newell and Mulvaney, 2013). For instance, their design and siting do not always take into account the interests of affected communities, and often overlook the possible effects on cultural and environmental landscapes (Yenneti and Day, 2016; Pesch *et al.*, 2017). Therefore, analysing justice concerns related to wind and solar energy developments is vital due to the rapid deployment of such technologies in many parts of the world—and their potential to continue expanding in the near future—especially in developing countries where injustices, inequalities and vulnerabilities in disadvantages societal groups prevail and so far, underexplored by scholars.

As noted by Sovacool *et al.*, (2016), it is naive to affirm that renewable energy developments such as solar panels and wind turbines will by themselves emancipate citizens from a world heavily dependent on oil. These authors highlight that current forms of renewable energy in upper and lower-middle income countries are continuing the imperialism and colonialism projects (Sovacool, et al., 2013). Thus, in an evolving energy arena, the question of who pays for the energy transition might, indeed, be a matter of justice. Although Global North countries emit the greatest volume of CO_2, contributing heavily towards climate change, their counterparts in the Global South emit far fewer emissions, and yet have been recognised as the part of the world that will experience the greatest damage caused by climate change (Newell and Mulvaney, 2013; Healy and Barry, 2017). In addition, it is well known that solar and wind infrastructure requires large amounts of mineral resources such as iron and aluminium, which their extraction is highly pollutant (Geocomunes, 2020).

Furthermore, emerging international and national energy policies and the availability of cheap land and labour have made many upper and lower-middle income countries lucrative places for the allocation and investments (Donovan, 2015). Therefore, it is not surprising that the installation of green infrastructure is

planned to significantly increase in upper and lower-middle income countries. In fact, scholars have proposed that in the context of the global energy transition, the high-income countries are engaged in ‘energy bullying’ via the relentless promotion and encouragement of renewable projects in developing countries, through which the developed world reaps financial benefits (Monyei *et al.*, 2018, p. 68). Accordingly, concerns of energy justice have resonate globally and are linked to transitions towards a low-carbon economy of high income and lower and upper- middle income nations (Yenneti et al., 2016; Bridge et al., 2018; Lacey-Barnacle et al., 2020).

The still-evolving framework of energy justice began in the early 2010s, when Guruswamy (2010) argued that justice should be the first virtue of social institutions and energy is critical for human progress. As such, the author defined energy justice as a framework actively seeking to apply basic principles of justice to energy systems (Guruswamy, 2010). Subsequently, the energy justice framework gained momentum, especially in journals related to social sciences and humanities. More recently, it has reached the latest IPCC report, which stated “there is a need to incorporate social and ecological systems to increase resilience of energy sectors” (IPCC, 2018, p. 107).

Energy justice is deeply rooted in the more established concept of environmental justice (Schlosberg, 2009). The environmental justice framework has its roots in an environmental justice movement, which sought the fair treatment and meaningful involvement of social groups with respect to the development, implementation, and enforcement of environmental laws (Purdy, 2019). By way of contrast the energy justice framework has largely developed from scholarly. For some scholars, energy justice can be seen as an activist framework due to its potential to encourage and incorporate justice, equity and fairness into energy systems (Fuller and McCauley, 2016; Jenkins *et al.*, 2016). The energy justice framework might not have emerged from a social movement, but its core principles seek to counterbalance the asymmetrical power dynamics within the energy systems (Jenkins, 2018). As I will explain later in this chapter, the energy justice framework, through its three tenets, brings into view three important

dimensions in the siting of wind and solar energy projects (Velasco-Herrejon and Bauwens, 2020; Yenneti and Day, 2016).

Before addressing the definitions of energy justice, this thesis acknowledges that the concept of energy justice has been mainly utilised by Western scholars. However, it has been successfully applied in non-Western case studies due to its analytical lens of looking at procedural, distributional and recognition of justice of energy projects (Velasco-Herrejon and Bauwens, 2020; Villavicencio-Calzadilla and Mauger, 2018; Yenneti and Day, 2016). The ability to use such a framework in non-Western case studies is useful because, as I will argue later in this chapter, the results significantly differ with Western studies. This thesis will not analyse what justice is in terms of Western case studies, rather it attempts to analyse what justice means for indigenous people within solar and wind energy developments.

The most commonly cited definition of energy justice refers to "a global energy system that fairly disseminates both the benefits and costs of energy services, and one that has representative and impartial energy decision-making" (Sovacool and Dworkin, 2015, p. 436). This definition explicitly incorporates notions of both procedural and distributional justice into energy systems. Procedural justice refers to due process and good governance in the design and implementation of energy projects (Walker and Baxter, 2017). Sovacool and Dworkin (2015) have been influential in proposing that there are three main aspects to procedural justice: (1) who gets to access the decision-making processes, (2) how decisions are made and contested, and (3) how impartial the processes are. Distributional justice refers to who is bearing the cost and who is getting the benefits (Sovacool and Dworkin, 2015). McCauley *et al* (2013) include a third tenet – recognition of justice. This tenet highlights the importance of assessing energy policies, particularly their effects of these on disadvantaged groups. The energy justice framework is, therefore, an analytical tool for understanding where injustices emerge, and aids the formulation of energy policies based on the principles of justice and fairness to tackle social injustices

and environmental problems (Todd and Zografos, 2005; Jenkins *et al.*, 2014, 2016).

Whilst recognition of justice has tangential similarities with procedural justice, this "new" tenet is important as it specifically illuminates *how*, through a focus on power relations, some groups are disadvantaged within formal participation processes (Fraser and Honneth, 2003; Schlosberg, 2009, 2013). Recognition of justice within energy systems considers groups in society that are ignored, excluded or misrepresented and calls for a greater recognition of these groups to reduce social inequalities (McCauley *et al.*, 2013).

Recognition of justice also requires parity of participation in the form of social arrangements that permit all members of society to interact with one another as peers (Heffron and McCauley, 2017; McCauley and Heffron, 2018). So far, recognition of justice has mainly been used in studies focused on fuel poverty issues in Western countries among vulnerable populations and population with disabilities (Walker and Day, 2012; Hiteva, 2013; Middlemiss and Gillard, 2015; Snell, Bevan and Thomson, 2015; Chard and Walker, 2016; Liddell *et al.*, 2016; Reames, 2016; Gillard, Snell and Bevan, 2017), rather than studies focused on siting decisions (Yenneti et al., 2016; Pesch *et al.*, 2017; Villavicencio Calzadilla and Mauger, 2017; Velasco-Herrejon and Bauwens, 2020). However, such empirical evidence identified socially disadvantaged groups of society as bearing the cost of energy injustices. This doctoral thesis uses this evidence to provide insights into the siting of renewable energy projects in a developing country where solar and wind projects are to be installed in indigenous territories.

The interdisciplinary framework in this thesis is still emerging, consequently there are several different approaches to energy justice. For example, Hernández (2015) argues that energy as a human right should include (1) the right to healthy and sustainable energy production, (2) the right to the best available energy infrastructure, (3) the right to affordable energy, and (4) the right to uninterrupted energy service. However, the author falls short of developing what the best available energy infrastructure entails or suggests any means to achieve any of those four rights. A different approach is proposed by Baker (2016), where energy justice should include three related areas of law: (a) climate justice, (b)

environmental justice and (c) energy democracy, and advocates for more just ways of energy production (that is energy communities) incorporating community impact and promoting resilience.

Since most solar and wind energy technologies have benefits on a national scale, decisions on energy policies are made on that level (Thombs, 2019). Yet, the risks associated with the installation of such technologies are likely to have a local impact (Pesch *et al.*, 2017). There are studies at global, national and local scales using energy justice to assess the road towards a just energy transition. For instance, Villavicencio Calzadilla and Mauger (2017) argue that the three tenets of energy justice might help to reach goals of the global sustainable development agenda from a top-down approach. However, case studies have acknowledged that focusing on a local and bottom-up level might be a way of achieving greater energy justice (Forman, 2017; Hurlbert and Rayner, 2018; Lacey-Barnacle and Bird, 2018). As such, applying an energy justice framework on community energy initiatives could enhance citizens' rights and community empowerment as well as aid in reducing inequalities (Capaccioli *et al.*, 2017). Further, such authors explained how in practice the construction of energy justice in local communities is closely related to wider aspects of energy governance, such as receptiveness to citizen participation and the accountability of the process, policies and technological limitations (ibid).

Although approaches to energy justice differ slightly, there are two main approaches to energy justice: the eight-principle framework (Sovacool and Dworkin, 2015) and the three core tenets, outlined earlier, and proposed by McCauley et al (2013). The eight-principle approach is a framework that argues energy decisions should promote: (1) availability; (2) affordability; (3) due process; (4) good governance; (5) sustainability; (6) intergenerational equity; (7) intragenerational equity and (8) responsibility (Sovacool and Dworkin, 2015). However, other scholars argue that the eight-principle framework has been less favourable than the three-tenets approach, especially when the objective is to assess the impacts of energy policies (Lacey-Barnacle, Robinson and Foulds, 2020). Indeed, an in-depth conceptual analysis of the energy justice framework has been developed by McCauley *et al.* (2017) to explain its applicability in policy

design. Elements of justice have been used to explore distributional and recognition of justice on fuel poverty issues among vulnerable population highlighting a lack of recognition by energy policy makers (Walker and Day, 2012; Snell, Bevan and Thomson, 2015; Liddell *et al.*, 2016; Teller-Elsberg *et al.*, 2016).

Nevertheless, the triumvirate of energy justice framework (McCauley et al 2013) has been critiqued for a divergence in meanings of justice in relation to their respective strategies of attaining their individual goals (Wood and Roelich, 2020). Wood and Roelich (2020) analyse both the main approaches towards energy justice and note contradictions, such as the contravention of being rooted in environmental justice. Jenkins (2018) attempts to separate energy justice from environmental justice by analysing energy dilemmas that arise at each stage of a whole energy system in isolation from other societal issues. According to Wood and Roelich (2020), this approach facilitates top-down methodologies where justice definitions controlled by developers, governments, academics, international development agencies or economic elites may lead to the misrepresentation of citizens' concerns; the advocacy nature of energy justice deviates from what it claims to achieve.

In answer to this concern about the “watering down” of the advocacy characteristic of triumvirate approach to energy justice, Velasco-Herrejon and Bauwens (2020) draw upon Wood and Roelich´s (2020) arguments regarding lack of clarity within the triumvirate conception of energy justice about what can be defined as injustices, which ultimately leads to the exclusion of the values of activist-led community-driven movements. As such, they (Velasco-Herrejon and Bauwens, 2020) advance the debate by stating that a combination of the triumvirate of energy justice alongside exploring and analysing social acceptance, could provide a bottom-up approach of energy justice where community hosts of renewable energy define what justice ought to be. In their findings, the scholars provide insightful outcomes of using the three core tenets of justice in a case study of wind farms in Oaxaca, México. The authors proved the application of the concept of energy justice is useful for decision-makers to learn what fair distribution, meaningful recognition and due process linked to human well-being means when siting renewable energy technologies.

The following sections will discuss the conceptualisation of the three core tenets of energy justice and how these have been used to provide important empirical insights. The first part will focus on procedural justice and its applicability to different contexts. The second part will discuss the distribution of justice. The third part will analyse the recognition of justice.

2.3 Procedural justice

Procedural justice is often linked to the Free Prior Informed and Consent (FPIC) consultation process (Baker, 2016). The FPIC doctrine is the cornerstone of any consultation process. Although this doctrine was adopted internationally in 2007, both states and stakeholders involved in a development have had difficulty in executing it when consulting local communities (Baker, 2012; Bustamante, 2015; Dunlap, 2017a). FPIC is deeply rooted in a human rights-based approach to justice, because it prioritizes Indigenous Peoples' effective participation in determining how to achieve meaningful and positive outcomes to meet their needs, particularly using guidelines aligned to their respective cultures. Participation processes are common in large-scale energy projects such as mining (Holden and Jacobson, 2008; Vandenbroucke, 2008; Haberman, 2010; Anguelovski, 2011), oil extraction (Verbeek, 2012; Flemmer and Schilling-Vacaflor, 2016), large hydropower systems – such as dams – (Machado *et al.*, 2017).

The FPIC framework has constraints and problems. For instance, lack of engagement with indigenous communities causes conflicts within communities if, rather than being a consultation where people have a possibility to change the outcome of the projects, it instead becomes merely a legal box-ticking procedure – *a fait accompli* – (Hanna and Vanclay, 2013; Sugerman and Marie, 2013; Bustamante, 2015; Sieder, 2015).

Particularly in México, FPIC has failed for several reasons, including the concentration of land ownership among elites, conflicts between practitioners and locals, and also the poor timing of the consultation where, in fact, people cannot influence in any aspect of the project causing conflicts amongst community members (Baker, 2012; Dunlap, 2017a). FPIC focuses on indigenous peoples, whereas the procedural justice of energy justice goes beyond and allows the analysis of other vulnerable groups within indigenous populations such as women, the elderly, and so forth, as it advocates for the inclusion of all vulnerable sectors of the population. Hence, the scope of energy justice permits the examination of the dynamics of different stakeholders and in so doing, by way of contrast to the FPIC approach, provides outcomes to explore beyond Western theories and through elements of gender, race, class and power (Yenneti and Day, 2015, 2016; Reames, 2016; Villavicencio Calzadilla and Mauger, 2017; Jenkins *et al.*, 2020; Velasco-Herrejon and Bauwens, 2020).

Procedural justice refers to due process and democratic governance in the design and implementation of energy projects. As briefly mentioned in Section 2.2, within energy justice there are three main aspects to procedural justice: (1) who gets to access the decision-making processes, (2) how decisions are made and contested, and (3) how impartial the processes are (Sovacool and Dworkin, 2015). Some case studies have pointed out that energy infrastructures pose procedural injustices (Cornwall, 2002; Walker and Day, 2012; Walker and Baxter, 2017) because the decision on whether to approve or reject energy projects are in the hands of selected elites that normally have hidden interests that obscure their judgement, and in many cases government authorities are colluding with industry leaders (Finley-Brook *et al.*, 2018).

As an empirical example of the above, Velasco-Herrejon and Bauwens (2020) found that in two towns in Oaxaca only the mayor was responsible for making decisions on when and how to use resources received by wind energy firms. This reinforces the idea that political actors seek to legitimize types of energy generation according to their interests (David, 2014). In other words, policies promoting new technologies—such as renewable energy—would be positively received by incumbent energy coalitions only if the policies fit their private

interests (Stenzel and Frenzel, 2008). Thus, procedural justice requires impartiality, full information disclosure and decision-making processes to be coercion free by those in positions of authority, such as the government and industry (Chard and Walker, 2016; Davies, 2016). As part of an analytical lens, procedural justice facilitates the critical examination of decision-making processes to highlight the inequalities in these processes such as who participates in the design of energy policies, how information is disseminated and the participatory processes around the deployment of energy developments.

Additionally, cases of disenfranchised communities facing floods due to a large dam construction or marginalised landowners facing national policies in favour of industries in India are examples of the exclusion of local communities and unjust decision-making processes (Shiva, 2006; Shiva and Mosquera, 2006). For example, Yenneti and Day (2015) in their study of a solar park in Charanka, India, found that community members did not receive information from government officials or business developers about the project; community members became aware of the project when excavations started in their village. Furthermore, Yenneti and Day (2015) expose how such processes fail to include the essential requirements of participation and information. For example, there was only one written public announcement for land acquisition. Such an announcement failed to include important details of the project. In addition, this was published in a town in where the population has low-levels of education (ibid). As a result, the community members had to request proper information when the project construction had begun. There was no environmental impact assessment (EIA) carried out for this large-scale solar project, thus the information released did not include any social or environmental information regarding potential impacts on the community. After community members requested information, the government authorities and developers arranged one meeting. However, such authorities did not properly address questions from the community, and no further participation was implemented since then.

In other comparable cases, information has arrived too late. This phenomena has been experienced in the wind farms in Oaxaca as observed by Dunlap

(2017) who evidenced that there were already rent contracts with the wind developers two years before a public consultation was held aimed to inform community members about the wind energy project.

In both cases in India and México, the scholars observed that energy developers aligned with government officials failed to provide accurate mechanisms of participation or offer timely, adequate information with the ability to influence decisions. In this sense, solar and wind energy project processes need equitable participation in decision-making for all affected stakeholders in a non-discriminatory way (Walker, 2009). Such work further demands not only accurate, but also sympathetic, engagement mechanisms (Todd and Zografos, 2005) and for the views of all stakeholders to be treated with respect throughout the decision-making process (McCauley *et al.*, 2013).

Energy justice scholars (see for example, Ottinger et al., 2014; Yenneti and Day, 2015; Simcock, 2016; Damgaard, McCauley and Long, 2017; Tysiachniouk *et al.*, 2018) have wide agreement on the importance of opening up decision-making and policy processes to otherwise excluded or marginalised groups affected either directly or indirectly by energy policies, projects, systems and transitions. In addition, well-implemented procedural justice should include “two-way information exchange, meaningful participation, and adequate representation of all groups, including the marginalised “(Yenneti and Day, 2015, p. 672).

Another empirical energy justice article highlights that in Oaxaca, México, the wind development companies failed to assure participation and full disclosure information to the indigenous communities (Villavicencio Calzadilla and Mauger, 2017). The authors claimed that the meetings that were held created more confusion than the authorities wanted to dispel around wind farm projects, due to a lack of clarity about the impacts and profits that landowners could expect for renting their lands. As a result, organised assemblies took place without the meaningful participation of all directly affected community members (Yenneti et al., 2016; Villavicencio Calzadilla and Mauger, 2017; Velasco-Herrejon and Bauwens, 2020).

In parallel, empirical analysis of procedural justice showed that residents in all three municipalities in Oaxaca claimed that access to reliable information is a key factor affecting acceptance towards wind energy (Dunlap, 2018c, 2018b; Velasco-Herrejon and Bauwens, 2020). Specifically, the scholars noted that community members not only need to have access to data about the size and location of turbines, but they also require full disclosure about payments and contract clauses as well as the precise earnings of developers in case lease earnings are done based on a just percentage of profits, environment impacts, and the types of available remediation and mitigation measures (ibid). The authors argue that community members agreed that companies utilized a dubious strategy that limited their access to essential information in order to maintain tenancy prices and other benefits undisputed, and to avoid further negotiations.

Interestingly, such findings echoed Dunlap's (2018) article finding that developers' representatives deliberately promoted less interaction with the affected communities in order to avoid disagreements. As a result, this lack of access to information from government officials and developers and such top-down approaches have encouraged mistrust by host communities, leading to significant local resistance towards top-down approaches to wind energy development (Devine-Wright and Sherry-Brennan, 2010; Dunlap, 2018a; Velasco-Herrejon and Bauwens, 2020). However, missing from procedural justice is the importance of local perspectives not just for "fairness" sake, but also for the improved decision-making they can potentially contribute to. A parallel literature to justice, that could extend procedural justice analyses, and which has extolled the importance of including local knowledge, are those developed in Science and Technology Studies (STS). The next section briefly reviews this STS literature with a specific focus on the importance of including local knowledge in the planning, implementation and deployment of (energy) infrastructure.

2.3.1 Incorporating local and contextual knowledge into participatory processes

Formal participatory opportunities cannot by themselves ensure representative and democratic governance. There are, to begin with, some practical issues. Commonly, in participatory processes the interest of powerful stakeholders, especially those most fluent in technocratic language tend to drown out the concerns of the less-educated members. In this vein, not only do local people not possess enough specialized knowledge and resources to take advantage of formal procedures, but also participatory processes from a top-bottom perspective might not have the ability to include local knowledge into decision-making (Yenneti and Day, 2015; Villavicencio Calzadilla, Mauger and Fellow, 2017). According to the STS scholar Sheila Jasanoff (2005), participation is a normative standard operating procedure of democracy. As a result, formally constituted procedures do not necessarily draw in all those whose knowledge and values are essential to making progressive and effective policies (ibid). Therefore, decision-making processes require operating differently, where in addition to new technologies, such processes need to be proactive and collaborative (Ottinger et al., 2014) in a way that could include local knowledge into energy projects deployment (Finley-Brook and Holloman, 2016).

Frequently, participatory processes normally mean the citizen's right to be involved in decision-making regarding science and technology decisions granted to them via their citizenship (Irwin, 1995). In this sense, there is an urgent needed to move away from what Jasanoff (2003) called "technologies of hubris", where science is the solely authority on designing out future impacts and development trajectories, to including "technologies of humility," which "would engage the human subject as an active, imaginative agent, as well as a source of knowledge, insight, and memory"; such a shift would allow "plural viewpoints and collective learning" (Jasanoff, 2003, p. 240).

An empirical assessment of energy justice found that some communities “have resorted to more information channels due to their higher levels of education and knowledge of legal instruments to make information requests” (Velasco-Herrejon and Bauwens, 2020, p. 10). However, authors have highlighted that *saberes locales*[1] [local knowledge] has been overlooked, and that incorporating such knowledge is crucial in order to enhance accurate participatory processes (Yenneti and Day, 2015; Zarate Toledo and Fraga, 2015; Dunlap, 2016). In fact, Petts (2007) argues that it is crucial to focus on inviting people from host communities who can act as ‘gatekeepers’ of knowledge, concerns, and values into and from the community.

This section briefly explained a key factor to advance procedural justice is to include local knowledge from community members to facilitate fairer and more improved participatory mechanisms. The following section discusses some of the limitations of social and environmental evaluation that includes forms of participation within energy projects.

2.3.2 Beyond impact assessments

Building on the preceding section regarding the inclusion of local knowledge, this section discusses public participation that is constrained by established formal discourses and mechanisms, such as environmental impact assessments (EIAs) and social impact assessments (SIAs) It finds that these processes may not admit novel viewpoints, radical critiques, or considerations lying outside the taken-for-granted framing of the problem (Zárate-Toledo et al., 2019). Traditional community consultation has become a “fix that failed” (Dunlap, 2017a), ultimately resulting in procedural injustices (Yenneti and Day, 2015; Velasco-Herrejon and Bauwens, 2020). Here I briefly review and discuss empirical studies using energy justice to address such forms of participation.

[1] *Saberes locales* refers to local knowledge as knowledge that is rooted in a rural or urban locality, of a community, that transcends the school environment

Sanchez (2016) notes the omission of local knowledge within EIAs and asserts that such assessments presented by the private company *Mareña Renovables* in Oaxaca deny the knowledge of the peoples and overestimate the “expert” knowledge that indicates that there will be no damage to the fauna of the lagoon either by vibrations or by sound. She further argues that locals with experiential knowledge such as fishermen know perfectly well that the balance of the ecosystem is at risk, because they have knowledge based on their ancestral experience. Likewise, Velasco and Bauwens (2020) illustrate in their study that the EIAs of the wind project in El Espinal and Unión Hidalgo, Oaxaca also remained unavailable to the public. They highlight that some of the indigenous people in the region are not Spanish-speaking, and no interpretation services were provided by the companies for the meetings or for translating the Spanish lease contract agreements. Zárate-Toledo et al. (2019) assert that EIAs in México are done for each project, meaning that the cumulative and synergic effects of successive wind and solar developments are excluded.

Dunlap (2017, pp. 484) argues that these mechanisms of participation are “low-intensity, asymmetrical combat, a style of warfare that emphasizes intelligence networks, psychological operations, media manipulation, and even security provision and social development to maintain governmental legitimacy”. In other words, participation of local communities on the basis of lack and unreliable information might lead to a process that is ineffective and unjust.

In research conducted in Chile, energy solar projects have lacked adequate participation with directly impacted indigenous communities during their development. For example, even with compulsory EIAs for projects from 3 MW upwards, a study shows that these assessments have been implemented to serve more as an instrument of political peddling than as a safeguard for citizens and the environment (Villavicencio Calzadilla and Mauger, 2017). Pesch *et al*. (2017) use energy justice to assess what they called formal and informal assessments in energy projects in The Netherlands. In their study, they profiled two interacting trajectories of assessments: a formal trajectory that is embedded in the legal systems (EIAs, risk assessment) and an informal trajectory (overflowing) that is embedded in public discourse that can be perceived as a

lack of attention to particular concerns of values in the formal trajectory (ibid). Overflowing gives rise to an informal trajectory of assessment in which alternative value claims are presented. This can lead to advocacy for public values that some actors consider to be underrepresented in the formal assessment trajectory (ibid).

The informal trajectory materializes in the formation of new advocacy groups and media debates, all articulating new or altered public discourses (Pesch *et al.*, 2017). The values and concerns that were included in the formal assessment trajectory leave little room for the values and concerns of the citizens to be considered. The omission of citizens' values and concerns give rise to an informal negative trajectory of assessment, the formation of advocacy groups, and increased media attention on the opposition. The omission can also give rise to a growing distrust of the local actors towards the project-owners (Pesch *et al*., 2017). Indeed, cases have shown how the two assessment trajectories deployed different rationalities and how all actors were seemingly convinced that their actions and motivations were democratically legitimate (ibid).

The academic literature on energy justice has revealed the emergence of participatory forms of advocacy that both involve the grassroots in agenda setting through genuine collaborative and participatory methods, and opens up policy processes to a wider range of less-heard voices and stakeholders (Harper, 2001). Bird and Barnes (2014) argue that the involvement of different stakeholders—which they called `intermediaries'—into energy decisions has helped increase participation by local communities. The intermediaries function as a bridge between local communities and authorities by advocating the inclusion of their voices in energy processes (Lacey-Barnacle and Bird, 2018). Energy justice thus seeks to counterbalance policies that are mainly products of elite interpretations and appropriations of development by increasing the awareness of injustices surrounding energy systems.

There are three significant limitations of risk assessments, cost-benefit analysis, environmental modelling: firstly, they present certain peripheral blindness towards uncertainty – “technical and economic proficiency conveys the false impression that the analysis is not only rigorous but complete”; that it has taken

into account all possible risks when the opposite of often found to be the case (Jasanoff, 2003, p. 239). Secondly, the technologies of predictive analysis tend to pre-empt political discussion – the boundary work that separates the space of objective policy analysis is carried out by experts – so that the politics of demarcation remains locked away from the public review and criticism (Jasanoff, 2003; Jasanoff and Kim, 2013; Sánchez *et al.*, 2019). Thirdly, technologies are limited in their capacity to internalise challenges that derive from their framing assumptions (Jasanoff, 2003; Pesch *et al.*, 2017). Therefore, relying only on this type of assessment might offer misleading outcomes that could translate into significant impacts on host communities. However, analyses using a justice lens are not fully able to take into account the power dynamics of decision-making (Eames and Hunt, 2013; Reames, 2016; Yenneti et al., 2016). The next section attempts to go beyond procedural justice by highlighting the value of incorporating a power dynamics analysis approach into a justice conceptual framework.

2.3.3 Advancing procedural justice

Despite the analytical lens of an energy justice framework, very little work has focused on power relations and the flows of power within and between participatory spaces. In fact, it has been argued that just participatory processes must include efforts to address pre-existing power inequalities between participants (Schlosberg, 2009). Through the course of this research, some shortcomings in the concept of energy justice became clear. Conventionally, energy justice as a concept rest on a three-legged framework, including distributional, procedural and recognition dimensions (McCauley et al., 2013). It emphasizes that changes in energy systems must address inequalities in power and injustices across these entire systems (Jenkins et al., 2018). However, it falls short of enquiring how these injustices historically arise and embed themselves, or how historical experiences of shared injustices might complicate contemporary justice questions. Given the historical injustices faced by the Mayan population in southern Mexico, the need for an additional framework became clear.

The power cube model, developed by John Gaventa, enables both historical and spatial forms of injustice to be disentangled and allows relations of power to be examined more deeply, including historical relations of power (i.e between colonized indigenous peoples of Yucatan and the colonizing large landowners, for instance), which the energy justice framework is less able to do. Therefore, the energy justice framework needs assistance in understanding the power dynamics within the local consultation process on decision-making and siting. This thesis uses the power cube for two main reasons: (1) responds to calls on how to address issues of power within participatory processes related to energy (Williams and Doyon, 2019) and (2) because it describes how power is used in spaces and places of participatory processes.

The power cube is a framework proposed by Gaventa (2003) assessing power relations in participatory spaces. Gaventa (2003) builds on work by Steven Lukes (1974). The authors referred to as the three faces or dimensions of power were also adapted and discussed by Veneklasen and Miller (2002). Such spaces of dimensions of the cube had multiple roots, coming from work by Brock (1999), Cornwall (2002) and McGee (2002). In this sense, the power cube recognizes that spaces for participation are shaped by power relations among different stakeholders (Cornwall, 2002). Gaventa (2003) defines space as the different physical spaces in which decision-making takes place, where citizens not only have the right to participate in any given space but the right to define and to shape that particular space. In this sense, spaces refer to areas where citizens have opportunities and channels according to their needs, and where they can act to potentially affect policies, decisions and relationships that affect their interests.

According to this theory, there are three types of spaces: first, closed spaces controlled by an elite group without broader consultation or involvement. This type of space is also known as “provided space” – the state makes decisions and provides a service to the people without the need for broader consultation or involvement (Gaventa, 2003). Second, invited spaces with external pressure or in an attempt to increase legitimacy. This type of space is arranged by various kinds of authorities such as government, supranational agencies and non-

governmental organisations (Cornwall, 2004). In this sense, this type of space looks forward to institutionalised forms of consultation (Gaventa, 2003). Third, claimed spaces are the ones that emerge organically, often due to popular mobilisation with like-minded people (Cornwall, 2004), this space provides the less powerful with a possibility to develop their own agendas without control from power-holders (Gaventa, 2003). This type of space generally emerges from sets of common concerns or identifications such as identity or issue-based concerns where social actors reject hegemonic space and create spaces for themselves (Soja, 2008). For example, efforts from grassroots and civil society on opening such spaces through greater public involvement, transparency and accountability related to energy decisions (Bedi, 2018),

The power cube specifically distinguishes three main forms of power dynamics and how this shapes inclusiveness within participatory processes: visible power, hidden power and invisible/internalised power (Gaventa, 2003). Visible power refers to the power negotiated through formal rules and structures, institutions and procedures (ibid). Hidden power centres on the actual controls over decision-making, and the way powerful people and institutions retain their influence over the process and often exclude agendas of less powerful groups (Gaventa, 2003). In this sense, this type of dynamic operates on many levels to exclude and devalue the concerns and representation of disadvantaged people. Invisible/internalised power operates by influencing how individuals think of their place in society, this level of power “shapes people's beliefs, sense of self and even their own superiority or inferiority and explains why some are prevented from questioning existing power relations'' (Gaventa, 2003, p. 15). In this sense, the power cube helps to distinguish between different dimensions of power and enables an exploration of the way in which laws and institutions may be perpetuating repressive social norms and values (Luttrell *et al.*, 2007).

The use of the power cube has been mostly used by practitioners and it has spread and changed in a number of ways since 2003. For example, it has been used in a myriad of case studies[2] in different countries such as Zimbabwe, Brazil, Democratic Republic of Congo, Kenya, Bangladesh, Japan, and some cases

[2] Case studies can be found in https://www.powercube.net/resources/case-studies/

have been analysed by Pantazidou (2012). Power relationships and the uneven distribution of power, including their emergence historically in Mexico, are important features for the study of energy transitions, given the aforementioned acknowledgement that renewable energy transitions are not a priori just transitions, and there is a danger that without careful scrutiny RETs may reproduce or even exacerbate existing inequalities (Thombs, 2019). Whilst the energy justice framework facilitates the analysis of how, where and when injustices emerge (Sovacool and Dworkin, 2015) it does not facilitate the in-depth investigation of power relations and flow in different spaces. it is important to analyse power relations in order to achieve a just energy transition for all. The power cube concept enables the in-depth analysis of power flows, recognising that power is not something static, rather it is dynamic, and power flows vary depending on what type of spaces people are in (Veneklasen et al., 2002). In other words, the power cube describes how different aspects of power take place in empirical spaces by establishing possibilities for action, mobilization and change. Thus, the power cube can explain how actions affecting low carbon transitions are taking place in multiple arenas, many of which are disproportionately led by elites (Sovacool and Brisbois, 2019). However, such spaces might be claimed if collective action is mobilized. These insights are essential to this research due to the wide variety of spaces where solar and wind developments are unfolding in Yucatan, in which most of them are located in indigenous territories.

Ahlborg (2017), fusing case studies of small-scale electrification projects in Tanzania, explicates how and where power relations set off de/stabilised in processes where renewable energy technologies are introduced together with new organisational and institutional arrangements in local communities. Ahlbord (2017) shows how the introduction of electricity access leads to social inequality and enhances social mobility, expanding room for action for people to be involved. Explaining the power dynamics leading to these somehow ambiguous outcomes is important as this may help to better understand the potential for socio-political change to reduce poverty and create a more equal society (Ahlborg, 2017; Hurlbert and Rayner, 2018). Hence, it is rather proposed that

actors mobilise and make use of available resources and favourable institutional frameworks in order to be effective in their exercise of power. However, such resources and entitlements are not equal to power, and they should not be misunderstood (Gaventa, 2003).

In summary, this section has demonstrated that achieving a just energy transition by incorporating a focus on power dynamics using the power cube could lead to better participation spaces including how policies are being made and who gets to participate in such policy designs to the social, cultural and environmental dimensions of their implementation. The next section will discuss distributional justice literature.

2.4 Distributional justice

Distributive justice relates to the distribution of benefits and ills associated with institutional and technology changes in energy systems, and addresses the inequalities produced by these changes, as well as the possible mechanisms to resolve the potential inequity that emerge from such inequalities (Hernández, 2015; Finley-Brook and Holloman, 2016; Simcock, 2016; Yenneti and Day, 2016; Sovacool, 2017; Sovacool *et al.*, 2017).

Distributive justice within renewable energy developments has been relatively overlooked and this may be due to the possible misconception that renewable energy is an environmental and social good and hence inherently just (Yenneti and Day, 2016; Villavicencio Calzadilla, Mauger and Fellow, 2017). However, there is not enough evidence to assume *a priori* that renewable energy is without injustices. For example, wind energy projects generally get accepted where marginalised people are concentrated and as such socio-economic factors have great influence in the geographic allocation of wind farms (Liljenfeldt and Pettersson, 2017; Roddis *et al.*, 2018). The distribution of benefits among host communities have been proved insufficient compared to the revenues that developers might receive (Yenneti and Day, 2016).

Principles of justice offers an effective tool for addressing distributive problems in the design of climate policies (Vandenbroucke, 2008). Distributional justice focuses on the distribution of energy as a social good and investigates where abuses of energy systems arise as a social dis-benefit; that is, where injustices emerge. Thus, assessing RET under this tenet illustrates how spatial issues might arise from the allocation of energy infrastructure. Distributional justice has been utilized in a wide range of issues such as energy poverty (Ekins and Lockwood, 2011; Walker and Day, 2012; Hiteva, 2013; Simcock, 2016; Teller-Elsberg *et al.*, 2016).

The role of equity within energy policy has largely been limited to the safeguarding of markets, security of supply and efficiency (Sovacool *et al.*, 2019). It focuses on government policies aimed at securing energy sources at the minimum cost, including social cost (Alvial-Palavicino and Ureta, 2017). This opportunity cost has been historically underestimated. For example, Martinot (2001) argued that the World Bank´s plan to tackle energy poverty means lending support to large-scale infrastructural projects to secure affordability of energy services. However, such developments that aimed to reduce the burning of fossil fuels to produce energy have been causing different problems including - but not limited to - human rights violations and environmental and land issues, both at a global and local scale (Gross, 2007; Liljenfeldt and Pettersson, 2017; Roddis *et al.*, 2018; Baker, 2020). Without a doubt, the transition towards a low-carbon economy is both necessary and inevitable; it needs to shift to more sustainable sources of energy whilst taking into account the necessary trade-offs.

Some energy policies might have occurred at the expense of local livelihoods (Yenneti et al., 2016; Castán Broto *et al.*, 2018) and in some cases to the most disadvantaged or subaltern groups such as indigenous peoples (Yenneti et al., 2016; Baker, 2018; Siamanta and Dunlap, 2019). As a result, recent studies pointed out that focusing on a local level might be a way of achieving greater energy justice (Forman, 2017; Hurlbert and Rayner, 2018; Lacey-Barnacle and Bird, 2018; Lacey-Barnacle and Robison, 2020). All these cases also acknowledge that energy policy needs to address the unequal distribution of the dis-benefits resulting from decisions on energy policies and on infrastructure

siting. This applies to decisions involving wind farms (Gross, 2007; Howe and Boyer, 2015; Liljenfeldt and Pettersson, 2017), nuclear waste facilities (Jenkins et al., 2017), subsidies (Monyei, Adewumi and Jenkins, 2018), pricing (Sovacool, 2015; Reames, 2016; Gillard et al., 2017) or consumption indicators (Milchram *et al.*, 2018). In this sense, energy justice is also concerned with social responsibility by the private sector, the government and the public.

Hall (2013) argued that energy justice literature has thus far focused on consumption at an international level and less on local matters of energy systems. Initially, the energy justice framework aimed to address energy systems at a macro level highlighting its procedural, distributive and recognition aspects. For instance, Heffron and McCauley (2014) claimed that using energy justice at a level of national energy policy can enable the growth of new energy supply chains. LaBelle (2017) goes further, highlighting that focusing only on universal energy issues could have negative externalities on specific areas.

Velasco-Herrejon and Bauwens (2020) explored energy justice related to wind energy at the Isthmus of Tehuantepec, Oaxaca, their findings were that there is an uneven distribution of benefits and dis-benefits coming from the wind energy industry. The authors found that wind farms brought various benefits to the local economy. However, they were not equally distributed among local people directly affected by wind parks. Conversely, dis-benefits were felt by the wind farm´s directly impacted community as well as the neighbouring communities as a whole. As a result, this situation has caused increasing inequalities between the few benefited and the many non-benefited, which has created negative attitudes towards wind farms in Oaxaca.

According to the International Renewable Energy Agency (IRENA) worldwide renewable energy projects have generated around 11 million jobs (IRENA, 2019). However, some studies have pointed out that locally jobs did not increase at the expected rate (Dunlap and Fairhead, 2014; Yenneti and Day, 2016; Dunlap, 2017b; Villavicencio Calzadilla and Mauger, 2017; Siamanta and Dunlap, 2019). For instance, Velasco-Herrejon and Bauwens (2020) reported that community members in the Isthmus of Tehuantepec were keen to access formal and better-paid work. In fact, employment was available at the time of the

construction phase of wind farms, which lasted for about two years, leaving only an average of 1.6 % post-construction of all temporary workers permanently employed (ibid). This has caused concerns about unequal and insufficient access to employment opportunities for a greater number of community members. For example, highly skilled jobs are usually only conferred to foreign workers hired by wind energy developers (Yenneti et al., 2016; Siamanta and Dunlap, 2019). Moreover, developers expressed that local workers do not have the required skills to conduct expert duties such as training for working at height, engineering management, among others (Villavicencio Calzadilla and Mauger, 2017; Velasco-Herrejon and Bauwens, 2020).

Nonetheless, local communities consider this decision as unreasonable given the need for long-term employment and the possibility of local people acquiring expertise through training specialised in wind technologies (Zografos and Martínez-Alier, 2009a; Yenneti and Day, 2016; Yenneti et al., 2016). Moreover, promoters offer the available low-skilled jobs to people who rent their land and/or their relatives as a payment mechanism to avoid community members blockading roads and protesting to wind developments (Villavicencio Calzadilla and Mauger, 2017). The unbalanced distribution of employment negatively impacts community perceptions of energy projects because community members who do not benefit from them, no longer see employment as a benefit of the wind energy project. This might widen the social and economic gap between landowners and non-land owners.

The Isthmus of Tehuantepec in Oaxaca depicts important distributional injustices because it is host to the largest wind energy farms in Mexico and yet it is one of the poorest states of the country (INEGI, 2018). In this sense, the injustices in the distribution of benefits and ills are also in evidence. Sited in a region with poor energy services, the wind energy developments were designed only to export electricity from the isthmus to large industrial consumers (Walmart, Heineken, to mention a few) elsewhere in México (Baker, 2014; Nuñez-Terrones et al., 2019; Sánchez *et al.*, 2019). Hence, such large-scale energy projects do not offer better access to energy services for local people. In contrast, the developers obtained substantially financial profits whilst offering poorly and short-

term remunerated jobs for the local population.

Using the energy justice framework Yenneti and Day (2016) analysed the Charanka solar park in India. This project accounts for 216 MW installed on 2,000 hectares (ha). According to the scholars, the benefits and dis-benefits are already unevenly distributed. For example, the community members of the Rabari community - representing half of the community's population and other small farmers of Charanka - lost access to land and many of them sold their lands for a very low price. This meant that their traditional way of living was no longer an option, so they had little or no choice but to work in the construction of the solar park for low wages and only for a limited period. The authors explained that promises of new infrastructure did not materialise, and the electricity was exported to the grid, generating benefits for the companies involved and the state (Yenneti and Day, 2016). In addition, the case study showed that only a small part of the population, already in privileged positions due to the caste system, could seize the opportunities. On the contrary, for the poor and marginalised majority, the solar project resulted in distributive injustices that exacerbated their precarious living conditions.

Similarly, Villavicencio Calzadilla and Mauger (2017) assessed solar energy projects in Chile highlighting distributive injustice. The scholars observed a significant concentration of solar developments mainly in three regions. They found that the solar projects are part of a national plan to increase energy production in order to satisfy energy demand of the mining sector and the residential sector, especially in Metropolitan Santiago. However, such regions where the developments would be located have the lowest rates of electrification and the inhabitants, mostly indigenous communities, have no benefits from these developments. In other words, large-scale solar projects in Chile benefit industries and urban zones, whilst the local members do not benefit from them in any way.

2.4.1 The marketisation of nature

Environmental schemes aiming to ameliorate climate impacts have the effect of intensifying utilitarian-economic outlooks towards nature (Sullivan, 2013). Since the economic crisis of 2008, global policies have been looking at a new innovation rhetoric that leads to a green Keynesianism. The green Keynesianism aims for substantial programmes of state-supported green innovation intended to revive economic growth, taking into account environmental programmes and social inequity bequeathed by an era of neoliberal dominance (Goldstein and Tyfield, 2017). This approach extends to green jobs to secure the losses of fossil fuel jobs, however, a key source of consternation about these types of jobs refers to their quality and durability, as most infrastructure work disappears once construction is completed (Knuth, 2018). In theory, this new trend aims to create green and decent jobs through capital-intensive innovation (Stevis and Felli, 2015).

Additionally, sustainable development discourse used by politicians often does not address questions of inequitable economic growth (Luke, 2005). From this perspective, green policies - particularly energy policies - under market mechanisms are seen as solutions to climate issues with wider social benefits rather than rethinking the relations between economy, society and nature. This suggests that by simply shifting to technologies promoting economic activities with lower pollutant externalities might solve environmental, economic and societal problems. However, some of these mechanisms are having negative outcomes such as accumulation by dispossession, green grabbing and human rights violations (Corson et al., 2013; Yenneti and Day, 2016; Siamanta and Dunlap, 2019). For instance, Bumpus and Liverman (2008) characterise investment in carbon offsets as a strategy of “accumulation by decarbonization”, arguing that carbon offsets are having considerable profits from emissions reductions (Bumpus and Liverman, 2015, p. 142). Furthermore, by registering wind parks under the scheme of clean development mechanism (CDM) projects, many promoters enjoyed financial subsidies, which they did not share equally with the host community. In fact, market-based mechanisms rationale is that the commodification and marketisation of nature is viewed as a win-win solution in

order to ameliorate the ecological crisis by “selling nature to save it” (Dunlap and Fairhead, 2014, p. 948).

Commodity markets using natural resources reinforced by climate change mitigation and adaptation strategies might intensify economic production and consumption and by extension the ongoing degradation of the natural environment (Harvey, 2007). These can be encompassed by ecosystem alterations, unbalanced benefit sharing, political and economic corruption and export-oriented development models (Zografos and Martínez-Alier, 2009b; Martínez-Alier, 2010; Dunlap, 2016). For instance, scholars have argued that land and resource transfers involve different forms of international, national and local level of involvement, utilising a diversity of coercive and dubious tactics to retain resources control (Borras *et al.*, 2012; Dunlap and Fairhead, 2014; Dunlap, 2016). This type of land and resource transfers has been recognised as green grabbing: “transforming livelihoods and landscapes in profound ways. Sometimes the impacts are direct and material, as where appropriations of nature are manifest in forcible, sometimes violent removal of people from land” (Fairhead et al., 2012, p. 252).

Specifically, in Mexican wind and solar projects, the economic rationale has been largely standardised on a business model of private capital funding with high investment returns to shareholders, feeding energy into the grid and working through a liberalised but yet still regulated market (Baker and Tex, 2010; Baker, 2014; Sánchez *et al.*, 2019). This business model prior to the Energy Reform is called self-supply (autoabastecimiento), under this mode ‘clean’ energy becomes a distinct commodity, with tariffs available for big companies (e.g. Heineken, Walmart, CEMEX) to purchase their electricity demand from renewable sources (Hartmann and Ibáñez, 2007; Howe et al., 2015; Baker, 2016).

Under such a scheme there is little to no room for communities to own their solar or wind project. Indeed, when a community-owned wind project was proposed in the Isthmus, the authorities opposed it (Dunlap, 2017a). The Energy Reform has created a new institutional, legal and economic framework for the delivery of renewable energy developments. To date, the limited research which has

explored the dimensions of energy justice related to renewable developments in México, have predated this emerging socio-economic, legal and political context. This research aims to advance the evidence of wind and solar energy projects after the Energy Reform, which radically changed México´s energy system.

Solar and wind infrastructure pose some negative environmental externalities as wind farms have greater carbon footprint and solar photovoltaics (PV) contain hazardous chemical elements. In relation to economic and social benefits, empirical evidence of green infrastructure -such as solar PV and wind farms- suggests that in many cases the obtained benefits are in the hands of those who own the capital, rather than in host communities (Yenneti and Day, 2016; Dunlap, 2017b; Velasco-Herrejon and Bauwens, 2020).

In some cases, the burdens of energy infrastructure outweigh the benefits (Gross, 2007). In other cases, empirical evidence reveals that RE infrastructure is located in rural areas (Yenneti et al., 2016) or that projects got acceptance in areas with low levels of education (Roddis *et al.*, 2018) and other cases are located in areas with low-income population (Liljenfeldt and Pettersson, 2017). This might imply that an asymmetry of information exists, as a lack of education and information may be particularly disadvantageous to members of already disadvantaged minority groups. Thus, host communities are likely unable to negotiate for the possible benefits of RET projects may have brought (Yenneti and Day, 2016; Dunlap, 2018b; Siamanta and Dunlap, 2019).

The green economy might be seen as the lesser industrial evil, utilising a particular discursive technique in order to continue the proliferation of industrial waste in the name of climate change mitigation (Dunlap, 2014). This section attempted to discuss how market-oriented policies aiming at mitigating impacts on climate change might lead to widening existing inequalities. The following section, I will analyse the impacts of energy systems on disadvantaged and marginalised groups of society.

2.5 Recognition justice

The last core tenet of energy justice is recognition. Recognition justice considers groups in society that are routinely or repeatedly ignored or misrepresented and calls for a greater recognition of these groups in order to reduce social inequalities (McCauley *et al.*, 2013). The core tenet of recognition of justice was developed to go further than procedural and distributional justice by giving an important emphasis on the minorities that have been ignored systematically by various social, political and economic structures in society (McCauley *et al.*, 2013; Jenkins *et al.*, 2016; Jenkins et al., 2018). Building on Fraser´s (2000) concept of misrecognition, recognition of justice requires parity of participation in the form of social arrangements that permit all members of society to interact with one another as peers. Additionally, through including a cosmopolitan justice at the core of the conception of energy justice is recognition of the imperative to respect the dignity of each and every human being (McCauley *et al.*, 2019; Sovacool *et al.*, 2019). In other words, this tenet aims to illustrate how most forms of oppression have cultural aspects in need of remediation.

The inclusion of recognition of justice has been remarkable, because in its absence could lie cultural and political domination, insults, degradation and devaluation of people's views could be borne out (McCauley *et al.*, 2013; Sovacool *et al.*, 2016). This incorporation is highly important as it acknowledges limitations of procedural justice, highlighting that some groups are repeatedly and systematically disadvantaged within formal participation processes (Schlosberg, 2009).

In energy studies, recognition of justice highlights the importance of observing dominance in energy decision-making processes, such as the allocation of energy infrastructure within disadvantaged demographics and the need to recognise and include perspectives of less powerful populations. Recognition of justice draws attention to different forms of oppression such as racism (including white supremacy), sexism, ageism, among other types of discrimination in energy systems (Swanson, 2005). Most case studies used this tenet to address energy issues amongst elderly populations and people with disabilities by

recognising how policy makers overlooked issues related to fuel poverty (Hiteva, 2013; Snell et al., 2015; Chard and Walker, 2016). In addition, justice as recognition has been used to illustrate the difficulties faced by rural communities when large-scale energy projects are located in their territories (Yenneti et al., 2016).

In a more recent paper, recognition of justice aided in exposing the challenges post colonialism communities faced, in an ongoing energy transition (Castán Broto *et al.*, 2018). The case studies discussed above have widened the scope of the three core tenets. This research aims to contribute with a case study of RET developments where indigenous communities are facing similar issues of power, representation, and participation, among others but in a new institutional context.

Recognition of justice within energy systems considers groups in the society that are ignored and/or misrepresented and calls for a greater recognition of such groups in order to reduce social inequalities (McCauley *et al.*, 2013). It also requires parity of participation in the form of “social arrangements that permit all members of society to interact with one another as peers” (Heffron et al, 2015, p.175).

In the particular case of land tenure in Mexico, Baker (2016) asserts that the *‘ejido’* land tenure in México might enable community-ownership of renewable energy. However, it was also argued that each context in which community-ownership is pursued should have accurate legal amendments for land ownership. Baker's (2016) study recommends increasing local and community ownership of energy projects, thus connecting to the literatures of policies related to the potential advantages of decentralising energy developments in upper and lower-middle income countries (see for example, Alstone, Gershenson and Kammen, 2015; Alanne and Saar, 2006).

Appeals for recognition as a group are commonly understood in terms of redistribution, and not as recognition. In protests, people might feel the necessity to adjust their own vocabulary to technocratic policy terms, or protesters may have difficulties in expressing their concerns. This could explain why a benefit package might be perceived as a form of extortion, because it might undermine

the bond that a local community might have with the territories they live in (Drenthen, 2010; Devine-Wright, 2012). This claims that a negotiation on compensating schemes should recognise that the communities or groups have a unique identity, and this might impact positively on the acceptance of the project (Pesch, et al, 2017). Scholars in this area refer to recognition in terms of the capacity of any given social group to define their own identity in their own terms (ibid). As such, this heuristic approach aids to understand the way in which injustices are being recognised. It also explains how controversies around energy developments might occur, even if both formal and informal assessments adhere to the importance of distributional and procedural justice.

In framing the deployment of energy infrastructure, recognition injustices appear on both the production and consumption sides of the energy system. First, in the production side, through the installation of energy developments close to vulnerable groups' neighbourhoods or indigenous people´s territories without considering their rights, customs and values (Huesca-Perez and Sheinbaum-Pardo, 2016; Yenneti et al., 2016; Jenkins et al., 2017). Second, on the consumption side, through lack of respect and understanding for people who are commonly - and wrongly - accused of not being able to manage their energy necessities (Yenneti and Day, 2015; Dunlap, 2017a; Castán Broto *et al.*, 2018).

In many countries in the Americas, indigenous people are frequently marginalised and their culture, worldview and land-tenure systems are not recognised or are mediated as a – backward – by government officials and/or industry leaders (Yenneti et al., 2016; Velasco-Herrejon and Bauwens, 2020; Sánchez Contreras, 2021). The industry leaders and/or developers frequently believe that paying attention to Indigenous peoples' self-determination could slow down the development of the country (Vergara-Camus, 2012; Villavicencio Calzadilla and Mauger, 2017; Dunlap, 2018b). This is notably illustrated by the case of the indigenous people in the México and Kenya projects, where the project leader assured the government that the project complied with international standards related to indigenous people. Nevertheless, the developers did not recognise an ethnic group as indigenous, which led to the denial of legal right or claim to their land, and therefore, not eligible for land

compensation. This issue led to a lawsuit that is still pending (Villavicencio Calzadilla and Mauger, 2017).

In México, the wind energy development in the Isthmus of Tehuantepec is characterised by recognition of injustices. For example, Huesca-Perez and Sheinbaum-Pardo (2016) observed disrespect from businesses and government authorities for the territory and the culture of indigenous people. In different studies, Howe and Boyer (2015) and Dunlap (2017a) explained how elite members of the growing country's wind energy lobby made outrageous and racist claims against indigenous communities, whom they considered to be only ignorant communities obstructing the progress of México. This was evident and tangible when the indigenous community proposed a project of a community-owned wind farm in order to participate in the auction organised by the Federal Electricity Commission (CFE) (Baker, 2016). This project was excluded from competing for access to the electrical substation that is located on their own land (Baker, 2014; Dunlap, 2017a). The CFE argued that such community projects could never be able to obtain the financial requirements to develop their wind project. In this sense, the government failed to recognise the proposed project of the indigenous people of Oaxaca and ended the possibility that they could have managed the wind projects.

In the Indian context, the recognition of justice issues in Charanka relate to the Rabari community, a community lacking land ownership. This community has the particular characteristic of being nomadic which means that they are out of their territories for eight months every year. As a result, this situation poses difficulties related to the possibility to receive information about any local projects to be located within their land (Yenneti et al., 2016). Yenneti and Day (2016) note that, as a result, the Rabaris have been ignored by government authorities and local members of the castes. In this sense, the affected were the already marginalised Rabaris, whose way of life was not respected.

Evidence from Chile shows a long history of bitter relations between indigenous peoples and government, characterised by conflicts, principally due to the expansion of industrial projects located on indigenous territory (Villavicencio Calzadilla and Mauger, 2017). This fractured relationship is to be cautious

because most renewable energy developments are located in or neighbouring indigenous territories. The consultation processes have been characterised by a lack of respect for indigenous rights and lack of significant balance in compensation schemes for the impacted communities (Villavicencio Calzadilla and Mauger, 2017; Velasco-Herrejon and Bauwens, 2020). Consequently, this overlooking of indigenous territories and customs *(usos y costumbres)* has led to law actions delaying investments worth about 10% of GDP of Chile (Villavicencio Calzadilla and Mauger, 2017). However, issues outlined above appear to be slightly improving through the increased in consultations with indigenous people around wind energy projects (Velasco-Herrejon and Bauwens, 2020) by providing at least symbolic acknowledgment of their importance and value from government institutions (Villavicencio Calzadilla and Mauger, 2017).

Justice as recognition claims that certain groups of the society have historically experienced economic, cultural and social marginalisation. Hence, recognising these inequalities aids to ensure the respect and dignity of these disadvantaged groups which should be respected by others (Honneth, 1992; Wolsink, 2014). Accordingly, justice as recognition has been mostly proposed to point out at the injustices experienced by vulnerable societal groups, such as women, indigenous peoples, other ethnic groups, the working class or particular racial groups (Fraser, 2000; Bulkeley et al., 2014; Gillard et al., 2017).

Justice as recognition plays an important role especially when energy projects come to threaten the autonomy of a local community and ultimately causes the reinforcement of existing cultural, social and economic injustices. Justice as recognition alludes to the ethical need of vulnerable groups to define their own identity, which may be compromised by external definitions imposed by policy-makers or industry leaders (McCauley *et al.*, 2013; Monyei et al., 2018). Such definitions from outsiders contravene with the right of these groups and communities to preserve their collective identity autonomously. In consequence, justice as recognition allows to highlight the core characteristics that are intertwined to a particular context. In other words, groups of people should be able to self-identification and self-determination, which ties them as a community. Usually, cohesion and the relationship with the environment is an essential

component in the process of collective self-definition (Boege, 2008). Therefore, understanding justice as recognition requires attention for social and cultural practices as well as context, and these should be included in the general expert knowledge and policy categories in order to promote collective and inclusive decision-making.

2.5.1 Fighting for indigenous land

This section explores existing literature on grabbing indigenous land in México. As discussed in Section 2.2, imperialism and colonialism resurgence during an era of renewable energy technologies, which formed the foundation of energy systems in the colonial empires of the United Kingdom, France, Spain, The Netherlands and Portugal (Sovacool et al., 2013).

According to Gasparello (2020), large scale projects in México cause negative impacts such as: the loss of land and traditional territories; migration, eviction and resettlement; the depletion of the resources necessary for physical and cultural survival; destruction and pollution of the environment; the fragmentation of the community social fabric, and harassment and violence. Indeed, forms of territorialisation through infrastructural expansion are often violent, as simultaneous processes of enclosures and expulsions constitute a central aspect (Howe et al., 2015; Sanchez, 2016; Siamanta and Dunlap, 2019).

In México, the grabbing of territories and their richness responds in part to the reprimarisation[3] of the economy at the continental level, or neo-extractivism as some authors have called it, and in part to the capitalist ambition that spaces and populations – up to now marginal or not completely integrated into the market economy - are incorporated into the production of services and consumption of goods (Ceceña, 2012). This led indigenous peoples to have had an unprecedented role in territorial defense, for which they have used direct action,

[3] Throughout Latin America special regimes and laws were established that favored the extractive model and the reprimarization of economies driven by large transnational companies that managed to dominate key sectors of national economies, see Giarracca and Teubal (2013).

legal struggle and the strengthening of collective identities rooted in the territory, culture and ritual space (Gasparello, 2020).

Even though FPIC consultations in México might be seen as a bureaucratic tool (Baker, 2012; Dunlap, 2017a), it is still the most important instrument to protect indgenous territories, due to its binding nature —it must be respected by the States that signed it— is Convention 169 of the International Labor Organization (ILO, 1989). The claim for the respect of the right to consultation or eventually the complaint for its violation appears as the basis for many lawsuits linked to territorial disputes, which has contributed to the respect of a strategic argument that, on occasions and coupled with strong popular mobilisation, has managed to halt development of aggressive megaprojects (Gasparello, 2020).

Given the history of foreign intervention in México and more specifically in the region of Oaxaca regarding wind developments (Baker, 2016; Huesca-Perez and Sheinbaum-Pardo, 2016; Dunlap, 2018b, 2018a), colonial and neo-colonial based discrimination practices have been identified as a decisive factor in terms of project acceptance because indigenous communities in the Isthmus of Tehuantepec have regarded the deployment of wind projects as a threat to their indigenous rights, identity and cultures (Velasco-Herrejon and Bauwens, 2020). Velasco-Herrejon and Bauwens (2020) outlined how locals consider the wind energy projects promoted mostly by Spanish and French companies as a third conquest attempt because it follows similar strategies to the former colonial domination. Locals see wind promoters only as part of an extractive industry that benefits only foreign capital interests disregarding the local population concerns and needs (Velasco-Herrejon and Bauwens, 2020).

Certainly, there is an important gap to be filled by exploring wind and solar developments in Yucatán, where most of them are located in indigenous territories. Particularly, this research offers insights on RET developments located in communal land as well as provides empirical evidence on the power dynamics taking place in Yucatán. However, another key social group often systematically disadvantaged through such processes are women. The following section explores existing literature on energy justice related to women.

2.5.2 Indigenous women

This section aims to explore academic literature on the third tenet of energy justice with a focus on recognition of justice and indigenous women. From the perspective of Silvia Federici (2010) communal property regimes have included greater margins for action by women because, given the few to or no land rights they have had, the commons have been fundamental as a space for production and sociability. Hence, the commons, historically, have been related to the care or livelihood economies in which the role of women has been central (Shiva, 2006).

In a recent study, Damgaard et al. (2017) explored biogas developments in Nepal (Lohani et al., 2021). Their findings showed that biogas benefits women by improving their indoor air quality and by reducing the time and effort they need for collecting sources of fuel. Additionally, the authors believe that the participation of women was an explicit part of community biogas projects on the ground, and they noted that concerns about caste and ethnic equality did not appear to be an explicit concern amongst their studied communities (Damgaard et al., 2017)). These results, perhaps, are biased as gender inequalities were not part of the key objectives of the study, and such findings appear to be anomalous when compared with the wider literature (see for example Amir et al., 2020; Wilkes and Dijk, 2017).

For example, Moniruzzaman and Day (2020) did study gender energy justice in rural Bangladesh by analysing women´s energy conditions related to energy services and energy poverty impacts as well as their access to procedural and recognition of justice at household, community and national scales. In their findings, the authors concluded that distributional injustice is closely connected to, and enabled by, a lack of procedural energy justice and to a lack of recognition of justice to lower-class women in rural Bangladesh at all scales (ibid).

The relationship between women and energy in México is intrinsically linked to land ownership. In the 20th century, the Mexican Revolution of 1910 promoted the ejido as a type of ownership of social property. However, women were deprived of legal power to own and make decisions about the land. Thus, a predominantly male agrarian subject was established in México. According to estimates from the National Agrarian Registry (RAN), 77.53 % communal property rights belong to men and only 22.47 % belong to women (RAN, 2017). Sánchez Contreras (2021) argues that in México the relationship between indigenous peoples to their land can be understood from two perspectives: one not regulated by the State where women have continued the communalities that supports the territory and two, where the Mexican State administers the territory integrated predominantly by men. The author asserts this represents a serious issue for indigenous communities, especially in times of renewable energy extractivism, where the lack of legal power of indigenous women to decide on their communal lands has less to do with the tradition of uses and customs *(usos y costumbres)* than with the patriarchal and colonial logics that the legal framework of the nation-State has strengthened to facilitate land dispossession (Sánchez Contreras, 2021).

This section described the existing empirical evidence of energy justice related to women. It also briefly mentioned the tensions between indigenous women and land ownership in México. Although the aim of this thesis is to explore procedural, distributional and recognition of justice within solar and wind projects, the case study presented in this thesis also provides insights to understand perceptions of indigenous women in Yucatán by stakeholders.

2.6 Summary and Thesis Objectives

2.6.1 Research challenges and gaps

Based on the previous sections, most of the empirical work utilising energy justice as an analytical tool has focused on industrialised high-income countries

(Walker and Day, 2012; Simcock, 2016; Islar et al., 2017; Pesch *et al.*, 2017; Sovacool, 2017). Yet, there is, indeed, a growing body of literature in energy justice studies focusing on upper and lower-middle income countries (Yenneti and Day, 2015, 2016; Villavicencio Calzadilla and Mauger, 2017; Castán Broto *et al.*, 2018). In fact, there are three papers focusing specifically on energy justice in México. However, all of them are focused on wind energy developments (Baker, 2016; Villavicencio Calzadilla and Mauger, 2017; Velasco-Herrejon and Bauwens, 2020) and without an examination of the implications of the new energy laws brought out by the Energy Reform, discussed above. Therefore, such work provides only a limited understanding on wind developments within the previous institutional arrangements in México´s energy sector, while largely neglecting aspects of power that have been identified to achieve just processes in energy systems (Shove and Walker, 2007; Thombs, 2019).

Some research challenges can be identified to address this gap: firstly, this research is considering the new legal and economic framework from the Energy Reform. The restructuring of the energy sector facilitates and promotes, for the first time in México´s history, greater foreign capital to invest and install wind and solar projects in the country. This research aims to fill the gap on how these amendments to the law have social ramifications by promoting national energy policies disregarding potential local impacts in host communities.

Secondly, empirical studies in México are focused on perceptions about wind developments - no solar case studies have been conducted so far - , what appears to be the main challenge for research is to move beyond assessing only wind perceptions with energy justice lenses and identify the power dynamics inherent in energy policy-making and implementation of both wind and solar developments. Examining these dynamics could not only contribute to the literature on energy justice but could also add to the understanding of participatory processes in sensitive and vulnerable ecosystems and territories taking into account the power relations of all stakeholders within different infrastructure projects.

Thirdly, México is a multicultural country, rich in biodiversity and varying social and natural ecologies, that is among other things, a country with a vast population of indigenous people. This study uses the three tenets of energy justice particularly to address the challenges faced by indigenous peoples within solar and wind large-scale projects. Currently, a vast majority of such projects are to be located in communal land belonging to indigenous communities. Thus, the results of this study will support the development of methodologies that can be applied to other regions of México (and elsewhere in the world) who share similar characteristics.

2.6.2 Thesis aim and objectives

In order to fill the gaps observed above, the aim of this doctoral thesis is to critically examine the impacts of the development, deployment and indigenous responses to solar and wind energy in Yucatán using the energy justice framework along with theoretical underpinnings of the power cube.
The specific objectives are to:

1. analyse the deployment of solar and wind projects under the México´s new institutional and legal framework for energy in Yucatán;
2. identify and analyse the actors´ attitudes and perceptions to solar and wind energy projects, and the impacts being created on their communities;
3. analyse the participation of indigenous communities in the design, approval and deployment of solar and wind energy developments

Chapter 3: Methodology and Methods

3.1 Introduction

This chapter gives an outline of research methods I used in the study to obtain the data as well as the methodology underpinning the data collection. Accordingly, Section 3.2 discusses the qualitative approach used in this investigation. Section 3.3 and 3.4 details the research design, tools, and methods for data collection and analysis. Section 3.5 highlights the ethical considerations. Section 3.6 discusses research challenges. Finally, section 3.7 is an account of the researcher´s reflections during fieldwork. Whilst this does not directly answer the objectives set in this project, it was deemed important in the iterative and reflexive analysis of the data, especially in wider discourses of wind and solar development in rural areas of México.

3.2 Qualitative Methods

For the purpose of this study, I used qualitative methods. Qualitative research is based on the belief that first-hand experience provides the most meaningful data (Leedy, 1993). In addition, qualitative methods are used because, for the most part, they are intended to achieve depth of understanding (Patton, 2002). That is not to diminish the value of quantitative methods but to emphasise that qualitative methods lead to a more nuanced, rich and in-depth examination of a social phenomena. In other words, this thesis uses qualitative analysis because it facilitates exploring issues such as the role of communities within the deployment of renewable energy and what that implies (politically, socially and culturally) for a country transitioning towards a low-carbon future.

Qualitative methods are useful for understanding the different arenas involved in the energy transition in México (that is political, social, cultural) in which renewable energy policies are taken. In this research, qualitative methods were used to: (1) identify the main actors and their positions in relation to renewable energy developments in Yucatán; (2) to explore the different dynamics amongst actors; (3) to single out the trade-offs of the deployment of wind and solar

projects; (4) to identify the key aspects of different levels of governance within an ongoing energy transition.

As noted in Chapter 1, in order to investigate the governance of and relevance to energy transitions in México in more depth, I relied on a case study approach. This is useful because case studies facilitate the search for concepts and categories, which helps to understand a certain phenomenon where it is not clear the difference between phenomenon and context (Yin, 1994). Thus, I use Yucatán as a case study to explore the governance of energy transitions but also the unequal power relations in the development, deployment and indigenous responses to solar and wind energy in Yucatán.

3.2.1 Sampling

The snowball sampling method relies on referrals from initially sampled respondents to other people believed to have the characteristic of interest. The use of snowball sampling brings to the fore two concepts: social knowledge and power relations. In this sense, the snowball sampling design, social knowledge is presently viewed as primarily dynamic, processual and emergent (Seawright and Gerring, 2008). Thus, related to the notion of social knowledge is the notion of power relations which transpire between the researchers and the researched, and between the informants themselves. This feature too is tied to the fact that the snowball sampling makes use of social connections (Noy, 2005).

In addition, Faugier and Sargeant (1997) acknowledge that snowball sampling methodologies can facilitate studying hidden populations for whom sampling frames are not easily available. However, in order to reduce selection bias inherent in this type of method, multiple entry points into the communities were used through choosing as wide a range of interviewees as possible, to provide further contacts (Atkinson and Flint, 2001). For example, I relied heavily on snowballing to be able to access women interviewees. Initially, I approached women during different meetings for an interview. Some of them were comfortable having the interview whereas others were cautious and requested to have the interview in their

homes, the women themselves indicated to me other women who were eager to participate but due to household chores were not able to attend any meetings. Without snowballing, it is likely that women would be heavily underrepresented in my sample.

There was little information when I was researching the status of renewable developments in Yucatán in the media. However, there is a growing literature of wind energy in Oaxaca highlighting an array of conflicts between developers, government officials and indigenous population (Dyer, 2009; Hamister, 2010; Baker, 2012, 2014; Simon, 2013; Howe and Boyer, 2014, 2015; Juárez-Hernández and León, 2014; Howe, Boyer and Barrera, 2015; Sanchez, 2016; Dunlap, 2016, 2017a, 2018b, 2018c; Avila-Calero and -Calero, 2017; Mejía Carrasco, 2017; Brock and Dunlap, 2018; Siamanta and Dunlap, 2019). It was quite difficult to find information of such large-scale energy developments at a local level. Doing more depth research, I found videos made by scholars reporting their perceptions of the main issues with such developments. Thus, initially stakeholders' names were identified from newspaper articles, internet sources and policy documents from the government's website. Once I contacted these stakeholders, they suggested other potential respondents. My initial stakeholder was a scholar from the United States, Prof Shalanda Baker, back then she had finished conducting fieldwork in Yucatan. This interview was held through skype. She pointed out some of the key stakeholders to contact. Then, my first in-field interview was with Pedro Uc, an indigenous leader whom I contacted through Facebook. I explained my project and that Prof Shalanda Baker gave me his contact information. He accepted the interview and set up a time and date.

The Energy Reform opted for national auctions, a market mechanism, to boost renewable energy projects. This led to a large number of developments approved in a short period from 2016 to 2018. Instead of focusing on a specific technology (for example solar or wind energy), I decided to focus on those who have been accepted in the national auctions because each project has different characteristics and thus different stages of development. This allowed me to explore different stages of both solar and wind energy developments.

As the main purpose of this work is to develop an understanding of how RE developments have ramifications for energy justice, the sampling frame focused on sampling for diversity rather than a quantitative count of content. Thus, in this research I interviewed key actors, including indigenous communities, local, regional and national authorities, policymakers, developers, academics as well as international and national non-profit organisations identified by referral and snowball sampling (O'Leary, 2004).

I combined this analysis with a review of secondary literature on energy justice literature in order to provide an overview to investigate policy themes identified in the first step. Furthermore, I reviewed policy documents, amendments to the Law and grey literature, mostly published in México. The issues analysed included the role of government authorities in consultation and negotiation processes, their engagement with the community members on land acquisition processes, as well as the adequacy of the compensation paid to affected communities and the engagement mechanisms.

Importantly, initial contact was made through a scoping period, and further sampling was made through enquiries via email and snowballing (O'Leary, 2004). This allowed me to interview key stakeholders such as indigenous communities, national, state and local authorities, policymakers, developers, academics and both international and national non-profit organisations.

3.3 Methods

In order to address research objectives, I used purposive and snowballing sampling. In addition, I used three instruments: documentary sources, in-depth semi-structured interviews and ethnographic techniques. I conducted a policy review of energy reform, energy transition laws, among others in order to identify the principal key actors involved in such policies as well as knowing the possible environmental and societal implications of the approval of those policies.

Furthermore, the 76 semi-structured interviews used open questions as they allow respondents to express themselves in their own words and it allows complex motivational influences and frames of reference to be identified. This

was particularly important for this research as the education level of participants varies and some of them used indigenous languages. In the same vein, using open questions rest on the assumption that they are relevant to respondents and that respondents can give correct answers within the question-answer situation (Foddy, 1993) and handle the fact that in responding to a question people often provide answers to further questions (Fielding and Thomas, 2016). Additionally, I used non-participatory observation because I was invited to different meetings while I was doing fieldwork. I will expand in detail on the sampling and research methods in the following sections.

3.3.1 Documentary Sources

I used documentary sources as a key data collection instrument in policy reviewing. Furthermore, I used them to develop core themes and subsequent questions for interviewees for fieldwork.

Documents are key sources of information because they are stable, exact and have a broad coverage (Yin, 2003). However, they could be biased as they are often written for a particular purpose. Hence, it is important that such documents can be corroborated with other sources. In order to analyse these documents, I used qualitative content analysis because it allowed me to examine language with the aim of classifying large amounts of text into categories (Weber, 1990). According to Downe-Wamboldt (1992; p. 314) qualitative content analysis "provides knowledge and understanding of the phenomenon under study". For Hsieh and Shannon (2005), qualitative content analysis is a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and themes. Undoubtedly, one of the limitations to conduct this type of analysis are limited data (Weber, 1990) which was the case for the EIAs. I was able to analyse only the ones available, the rest of the EIAs were held by the SEMARNAT.

The documents used in this thesis included Mexican amendments to the law, government policies, international reports, civil society reports, press releases, developer presentations (e.g., YouTube videos from developer's website or meetings held in communities), EIAs and the social impact assessment SIAs available and government department websites. These sources were accessed online. In order to triangulate data from interviews, I reviewed three EIAs (San José, San Ignacio and Dzilam de Bravo energy developments) and an SIA (Justicia Social energy development). I reviewed this because there were the only ones available for public consultation.

Regarding the press releases, developer presentations, civil society reports and environmental and SIAs were assessed following four criteria: authenticity, credibility, representativeness and meaning (Scott, 2014). In this sense, I focused not only on the content but also to the author(s), objectives and the intended audience.

Regarding the policy documents and amendments to the law, I did not assess their authenticity. Rather I analysed them in order to explore the processes involved in policy making and how such policies interconnect. The policy review was particularly useful to detect themes and points of inquiry which formed the basis for creating interview questions.

3.3.2 Ethnographic techniques

For the purpose of this thesis, I used two ethnographic techniques: semi-structured interviews and participatory observation.

Ethnography refers to a description of peoples and cultures and has its origin as a research strategy in the literature of early social anthropology, which had as its objective the detailed and permanent description of the cultures and ways of life of small and isolated tribes (Descombe, 1998). There has been a disagreement as to whether the distinguishing feature of ethnography is the register of cultural knowledge (Spradley, 1980), detailed research social interaction patterns

(Gumperz and Cook-Gumperz, 1981) or the holistic analysis of societies (Lutz, 1981). Ethnography can also be defined as essentially descriptive, other times as a way of recording oral narratives (O'barr and Lind, 1981); by contrast, only occasionally is the emphasis in the development and verification of theories (Denzin, 1978). Overall, ethnography is considered a strand of anthropology that is dedicated to the observation and description of the different aspects of a particular culture, community or people, such as language, population, customs and livelihoods. Therefore, the methodological processes of ethnography are linked directly with society and its problems. I used ethnography as a research methodology because it describes and understands the perspectives of a variety of stakeholders involved in the development and deployment of solar and wind energy projects (Gómez Sánchez and Alarcón, 2005). Additionally, ethnographic techniques such as participatory observation aid in the analysis of participation (Clark et al., 2009) of indigenous communities in the design and approval of energy projects in Yucatan.

Ethnography can be described as a curious blending of methodological techniques (Denzin, 2017). Ethnographic approaches involve becoming a temporary part of the social setting. Theoretically, the researchers have first to learn the language; this not only means jargon and dialect, but also special meanings and unfamiliar uses of words. This gives sufficient insights into action in the setting to allow the collection of field notes (Fielding, 2016). Indeed, being born and raised in Yucatán gave me many advantages. Especially with my interactions with community members, I noticed a sense of relief from my research participants, both during interviews or meetings, when I told them I was a Yucatecan. For instance, many interviewees made questions about how it is living abroad without tacos and tortillas. The interviewees also asked for my background and the schools I have attended. These personal characteristics created a bond and made the interview run smoothly in a friendly environment (Reinharz, 2011). The first interview was crucial for my fieldwork because my first interviewee pointed me to additional contacts and invited me to attend a meeting organised by indigenous community members in Motul, a community located at the North of Yucatán, 36 minutes from the capital, Merida. I will expand in detail in the participatory observation section.

In this particular case, I do not consider myself as an indigenous Mayan because I do not speak the language fluently and I do not practice the same traditions. I am familiar with such traditions and I studied Mayan language in primary school so I can understand the most frequently used words. I was born and raised in the state capital, Merida, where there is only a small Mayan population. Most of indigenous communities are located outside the capital in rural areas. This has an effect of positioning me in a grey area, not quite inside or completely outside (Bell, 2019). I learned that in order to gain the trust of my participants, you have to share meals and never say ‘no’ to an invitation to their homes. My upbringing definitely gave me advantages because during meetings I was invited to have lunch (the most important meal in Yucatán) with community members. This helped me to gain their trust and listen to their main concerns, their fears and their hopes. I was able to see up close their indigenous knowledge and the ways they were organising themselves by reclaiming spaces of participation. Thus, being an overt observer allowed me to ask different questions and to move more freely in the field (Fielding, 2016).

As I will expand on Section 3.3.4, I did not anticipate I would conduct participatory observation. However, I was aware that the kinds of data the investigator gathers depends upon how they participate as an observer. Even though a researcher's participation is controllable to some degree, the observers cannot prevent themselves from being affected by the emotional interplay between the subjects of themselves and the observed. According to Schwartz and Schwartz (1955), there is a variable on the continuum of role activity is the degree to which the observer participates in the research situation, such a scale extending from passive participation to active participation. Within this scale of effective participation, the variables are the nature of the investigators’ emotional involvement in the interaction they are observing as well as the degree to which they become involved. The passive observer interacts with the observed as little as possible, this is a way of detaching themselves emotionally from their affective reactions and evaluations. The active observer maximizes their participation with the observed in order to gather data and attempts to integrate his role with other roles in the social situation (Schwartz and Schwartz, 1955).

During fieldwork, I used both types of participation. In the meetings organised by and for indigenous community members I remained a passive observer, taking notes of what was discussed, but during the breaks, I tried to mingle, presenting myself as a researcher which allowed me to schedule individual interviews. In the rest of the meetings I attended, I remained as a passive observer. This allowed me to see first-hand the interaction between different stakeholders.

Defining a research role for oneself is not entirely in our hands but it is, sometimes, tied to the people who facilitate research funding (Reinharz, 2011). When I reached the first face-to-face interview, I noticed the interviewee was cautious and was asking about my research and my sponsor. I made very clear the aims and objectives of my research, I explained in detail the ethics approval process and the fact that I do not work for the government. I also noticed that scholars from Yucatán appeared suspicious about the aims of my research. It was particularly difficult to gain their trust. Such scholars invited me to meetings they organised, demanding state environment agency Ministry of Urban Development and Environment (SEDUMA) spaces for debate regarding the potential impacts of large-scale renewable projects. I believe that attending those meetings allowed me to gain their trust as they kept inviting me to other meetings. Reinharz, (2011) explains how the relationship between sponsor and sponsored can become an ethical, methodological and interpersonal problem. To overcome this, I explained to interviewees that my sponsors (CONACYT and SENER) are not directly involved at any stage of my research project. By contract, I am obligated to send a progress report every six months signed by my supervisors. Actually, local scholars' interviewees were concerned that other institutions rather than CONACYT sponsored my research because they know this institution does not follow any particular agenda.

In the following sections, I explain in detail semi-structured interviews and participatory observation.

3.3.3 In-depth semi-structured interviews

In total, 76 semi-structured interviews were conducted from February to April 2018 in Yucatán (See Table 3.1). The interviews lasted between 1 and 2 hours. Importantly to highlight, there were no issues of multiple identities in this doctoral thesis regarding scholars being Mayas, all local scholars identified themselves as not indigenous.

Table 3.1 *Type of Interviews*

Organisation type	Number of interviewees
Community members	25
Non-governmental organisation	16
Government officials	12
Developers	4
Academics	13
NGOs	6

Semi-structured interviews were selected as the means of data collection for three main reasons. Firstly, they are suited for the examination of the perceptions and opinions of participants regarding complex issues and enable probing for more information and clarification of answers (Yin, 2003). Secondly, the diverse professional, educational and personal backgrounds of the sample group precluded the use of a standardized interview schedule. Third, the interviewer can adapt the research instrument to the respondents' level of comprehension and articulacy, and handle the fact that in responding to a question people often provide answers to further questions (Fielding and Thomas, 2016). This is particularly important for this thesis because there are different types of stakeholders. For instance, I have conducted interviews with "elite interviewees"

which might provide “the ding of data can be critical in uncovering the causal processes and mechanisms that are central to comprehensive causal explanations" (Tansey, 2007, p. 767). This type of interviewees involves talking to people who are especially knowledgeable about a particular area of research or about the context within certain research objectives. They are commonly in positions of authority of power by virtue of their experience and understanding (Gillham, 2005). At the same time, another stakeholder group is indigenous communities and the leaders of such communities. Both required different types of questions.

The questions were first going through a trailing process. Trailing means that attention should be paid in choosing questions thinking about the person who will be involved in the research study but not a member of the group that is actually being taken part of (Gillham, 2005). This allowed me to adapt the research instrument to the respondent’s level of comprehension and articulacy (Fielding and Thomas, 2016). In order to examine the energy governance and the power relations within energy transitions it is necessary to explore different perspectives and by doing so requires analysis from different stakeholders. At the same time, examining the local impacts of such policy outcomes would not be accurate to ask policy makers who are not living where the projects are being constructed. Thus, I prepared three different types of interviews: one for indigenous communities, another one for government authorities and the last one for NGO, research centres and academia.

Often interviews using open questions take a lot of time, as the interviewee might feel free to discuss a significant number of points. To overcome this variability, in some occasions I controlled by asking for the main reason rather than all reasons (Fowler and Mangione, 1990). There was never an intention to suppress interviewees’ responses rather there was a mechanism to redirect the interview to comprehensively explore their main perceptions.

Key questions were based on procedural, distributional and recognition of justice among all stakeholders since this research aims to analyse to what extent the renewable energy developments have ramifications to social injustices. As discussed in Chapter 2, this doctoral thesis uses an energy justice lens because

it aids to identify where, when and how injustices occur (McCauley *et al.*, 2013) This allows covering issues such as policies, design, planning, implementation of participatory mechanisms, and allocation of burdens and benefits of such developments as well as compilation of testimonies on whether developers engage with stakeholders by recognising different characteristics and addressing them with respect.

In all meetings with interviewees, I made sure my contact details were present and I encouraged them to contact me if they had any questions. Some interviews were held in rural communities where I was fully aware that the population might not be able to read. To avoid making them feel embarrassed, I offered to read out loud the consent form and I offered a copy in case they want to feel sure and confident.

3.3.4 Participatory observation

Initially, it was never my intention to conduct participant observation. However, access to those meetings was facilitated mostly by community members and local academics who invited me. Thus, at that moment I thought that it could be useful to attend those meetings since participation processes are under the scope of this thesis. From that moment, I researched participatory and non-participatory observation methodologies. During meetings I included the numbers present, the physical character of the setting, who said what to whom in a way that captured a general characterisation of the events (Randall, Harper and Rouncefield, 2007). I prepared field notes immediately after a round of observation (Fielding, 2016).

I used participation observation because it has the potential to engage people in all aspects of the research process and it is seen as a way of achieving a more relevant, morally aware and non-hierarchical research practice that can also be emancipatory (Pain, 2004). This was particularly important because one of the objectives of this thesis is to analyse power relations in different settings of participation. I also used non participatory observation in meetings where I was invited to attend but I was told I should remain as an observer. This was

especially valuable because it allowed me to understand interactions between different stakeholders in a naturalistic setting (James et al., 2019).

In addition to the interviews, I took in-depth notes during observations of key meetings (see Table 3.2). First, I attended meetings organised by academics where they requested state authorities for a space to discuss social and environmental implications of energy developments. Second, I attended meetings organised by indigenous communities where it is only possible to actively participate if one belongs to a community directly affected by these developments. In these meetings, the organisers only allowed the microphone to community members, observers, like myself, were allowed to take notes. Third, I attended meetings organised by academics, community members and local NGOs where they discussed mechanisms to protect their territories. Even though this type of meeting was held in an academic institution where an academic requested a space, community members organised this space to ask for legal counselling offered by an NGO.

Table 3.2 *Fieldwork meetings*

Type of meeting	Participants	Number
Public meeting	SEMARNAT and developers at communities	3
Consultation meeting	SENER, national and local authorities, communities	1
Organised meetings	Academics, state authorities, civil society, community members	4
Indigenous meetings	Indigenous and people by invitation only	3

I took notes during all meetings from descriptive information where I attempted to write as accurately as possible. For example, I took notes about the settings, actions, conversations and behaviours I observed during such meetings. I also included some reflective information, in which I wrote my thoughts, questions to

ask for clarification, ideas and concerns regarding my analysis (Clark et al., 2009). These notes took a very important part of my analysis, they complemented the information gathered in interviews.

Furthermore, once in the field and after my first interview I was referred to one of the Mayan leaders, Pedro Uc. He along with others now are a collective named Asamblea de defensores del territorio Maya *Múuch´Xíinbal*[4], an organisation that aims to defend Mayan territories. I had the privilege to witness how a growing number of indigenous peoples came together and organised themselves to defend their territory. During this interview, I was invited to attend a meeting where members of different communities were sharing their experiences and struggles against mega projects. In this eight hour-meeting held on a Saturday morning I was able to listen to many people and also after their participation I was able to interview them individually, as well as having informal conversations over meals.

Furthermore, I was also invited to workshops organised by academics and members of civil society organizations, including Articulación Yucatán[5] and Múuch Xíinbal in order to create a bridge to the local government. I was able to attend this meeting and observed the dynamics between these local and national governments as well as the academia, civil society, NGOs and a few community members. Additionally, when I visited communities, I realised that even though members were happy to speak to me they felt insecure when I was recording them, thus, I decided not to record them and instead I took notes. However, all quotations in this thesis are from the interviews.

During these meetings, I remained as an observer because the main purpose was to grasp how stakeholders interact in different spaces. At least I tried to remain an observer. Some community members invited me to a consultation meeting held by SENER. The meeting's location was in the town of San Jose Tipceh on a Sunday morning. I arrived and everything was ready: tents, chairs, food and music. I took a seat in the middle of the *"plaza".* The seats were taken

[4] Múuch Xíinbal is the Mayan for Walking Together

[5] Articulación Yucatán was formed in 2016 by local scholars in response to the rapid approval of wind and solar projects

mostly by middle aged and elderly people. Prior to the meeting, people sitting in the back started to yell that I should leave the meeting, as it was none of my business. People were yelling “Who are the outsiders? What do you want from us? You will disturb this meeting, kick them out of here”.

The authority from SENER addressed those claims by asking all attendees if they would agree to kick me out. The community members who invited me requested that the authorities give me the chance to introduce myself and based on that everyone could decide if I can stay or not. It was more than 40 minutes arguing between passing the microphone and shouting if they would allow me to explain who I was and what I was doing during the consultation processes. The main reason for not leaving the meeting immediately was that the community members who invited me to the meeting were saying: “please stay, you need to witness this injustice”. Whilst I never felt my safety was endangered. I was very uncomfortable and torn between wanting to respect both groups’ wishes. The community was clearly divided and I observed the tensions rising among and between different individuals, and at the end those who were asking me to excuse myself won out. I went to that meeting in order to observe the consultation meeting. Instead, I found myself at the centre of attention and claims of the community, a space I had never attempted to take. At that moment, my concerns were on the possibility of not having more interviewees from that community. I found it difficult to interview those community members openly in favour of solar and wind projects. However, when I came back to this town a few days later, I interviewed a few of those members. Additionally, a few days after, I contacted the SENER official who accepted to be interviewed. The SENER official requested a meeting in a hotel he was staying, and while he was having breakfast, I conducted the interview.

In all meetings, I clarified that I was conducting academic research for a doctoral degree (in the UK). Even in the meeting, I was asked to leave. I explained to SENER officials I was a researcher and showed my university ID along with information about my project in written form. The SENER official offered to be interviewed at a different time and location. Despite my aim to remain as a

passive observer, I believe that this situation also forms part of data collection as it tells us something which in any other case would not be possible to observe. It might indicate a lack of transparency and accountability on behalf of national authorities on the processes of implementation of solar and wind projects.

3.4 Data analysis

This thesis looked for analytical insights of the potential impacts of wind and solar energy infrastructure on indigenous host communities. In this section, I explain how I conducted the qualitative analysis used in this study. Such analysis used was the same for policy reviewing, interview data and notes from participatory observation.

3.4.1 Thematic analysis

I used thematic analysis of the data coded from policy reviews, documents, transcribed interviews and participatory observation notes. This type of analysis is useful for synthesising and analysing data collected through diverse qualitative methods (for example, interviews, observations and documents) (Vaismoradi *et al.*, 2016). Such a process involves not only organising the data but also making data become meaningful by developing themes that explain similarities and variations across codes. Furthermore, Foddy (1993) argued that answers to open questions are sometimes more valid than answers to closed questions only if the open-question answers can be interpreted and coded properly. As such, I developed themes through data-driven at first (Gibbs, 2012). For instance, procedural justice contains all related to the consultation processes, FPIC, and information disclosure. Recognition of justice includes aspects such as cultural issues, human rights, indigenous rights. Economic issues include distributional benefits of projects.

Interviews, workshops and consultation meetings were audio-recorded (with informed consent from the participants), and transcribed verbatim. Interviews

were conducted mostly in Spanish and in some interviews were a mix of Mayan and Spanish. I analysed transcripts in Spanish and I later translated excerpts to English. Thematic analysis was used to analyse all data. I transcribed audio recordings and then I translated from Mayan/Spanish to English.

I used a sequential analysis; this type of analysis is carried out sequentially in the sense that analysis begins during data gathering. This allowed me to reflect on my data between observations. In this approach, further data gathering is then directed to matters to which the observer has become sensitive by provisional analysis (Wald, 2004). In this sense, subsequent observation allowed me to amend and reflect on earlier ideas about the data, so I was able to refine and then pursue an analysis more consistent with the setting (Fielding, 2016). In this case, the concept-driven codes did not change but instead I included more codes regarding participation processes which became the data-driven codes.

The first set of initial codes helped to identify themes and patterns, which in turn helped to organise the data (Coffey and Atkinson, 1996). Further codes were a response to emergent data and analytical themes (Spencer, Ritchie and O'connor, 2003). After the process of referencing the data to their themes, I was able to compare and contrast accounts, perceptions about renewable projects in Yucatán and other key themes of this research. Coding helped to organise the data and managed in a way that I was able to look at it in different ways (Coffey and Atkinson, 1996). Initial concept-driven coding and data driven coding can be found in table 3.3.

Table 3.3 *Coding Themes*

Concept-driven	Data-driven
Procedural processes	Green capitalism
Recognition of justice	Energy communities
Economic issues	Business model
Climate change	Energy governance
Renewable energy	Scales of governance
Energy Reform	Politics

Prior to the fieldwork, I scoped out potential stakeholder interviewees. For example, in reviewing policy documents, I found key policy-makers who participated in the Energy Reform. I had time constraints regarding fieldwork. I spent three months conducting as many interviews as I could in Yucatan. Interviews with host communities reached saturation point where additional data do not lead to any new emergent themes (Saunders et al., 2018).

For coding field notes I used the Turner (1981) approach. This consisted in generating as many codes through a “brainstorming”. These codes were then compared to other field notes in the set. Some codes were discarded because they did not resonate with the other data. Importantly, once codes were established, an effort was made to identify parallel codes or processes in other types of collected data.

3.5 Ethics

All the field work carried out was approved by the University of York, Department of Environment and Geography Committee on the Ethics of Research on Human Beings. The ethics approval letters can be found in Appendix A. The researcher guaranteed that the interests of the participants were protected and that their participation was voluntary and based on informed consent. Recordings and pictures were taken only with permission. To ensure confidentiality, the identities of the participants were kept anonymous. All the photos used in this thesis had informed consent. Furthermore, care was taken over use of verbal (e.g., local greetings) and non-verbal (i.e., body) language.

To gain access to respondents, confidentiality and anonymity was guaranteed. Thus, when respondents requested anonymity, their names have been changed within this thesis. In fact, all respondents have been grouped into different categories. For national, state and municipal key policy, actors and government officials have not been divulged, instead they will be known as government officials. Scholars interviewed will be known as academia; NGOs' names were changed and community members will be known as indigenous populations with the exception of Pedro Uc who expressed his desire to be identifiable.

Despite the guarantee of anonymity, some participants were concerned of potential threats against them from the government and/or developers. I made the objectives of my research clear and clarified that taking part in the interview is voluntary and that no personal information will be shared with anyone. Such respondents mentioned that they felt scared but wanted to take part in the interview. As I will fully discuss in the following empirical chapters, some of the interviews took place outside their communities during meetings organised because they felt Merida (Capital of Yucatán) was a neutral territory.

I actively sought distance from my sponsors making sure that my interviewees know I was not politically aligned with them in any way. I also made it clear I did not belong to any political party and I did not offer any strong opinion even when directly asked. Identifying myself as a researcher might represent an ethical

issue because doing so is bound to change people's perceptions to some extent. It might make them more cautious but also it can make them more helpful. According to Gillham (2005) race and perceived social class are complex issues, the latter is especially curiously persistent and powerful, leading to an intrusive sense of deceiving in an interview situation. I was perceived as a Mexican, female, middle-class and this taken together will frame my interpretations of the research.

I was born and raised in Merida, Yucatán. This allowed me to research and get in contact with principal stakeholders in my own language. Furthermore, I was familiar with the rural context because when I was growing up, I had the chance to spend time in small rural communities due to my mother's job as a primary school teacher. Thus, I learned some words in Mayan and experienced some of the traditions and ways of living, such as the relationship with the environment, how to cook food and cosmogonic interpretations of life. Being born in Yucatán gave me some sort of advantage during fieldwork. This made it easier to be in the field with local communities in their everyday situations, which created a more fluid concept of power (Torres, 1992). According to Torres (1992) being in the field can never be restricted to the dominant face of power; theory must work with a fluid concept of power as a dialogical relation. In other words, the grounds of the relationship between researcher and the interviewee should avoid speaking patronizingly for others because only those directly concerned can speak in a practical way on behalf of themselves.

3.5.1 Positionality and Reflexivity

I acknowledge that conducting field research in a familiar context to the researcher has an inherent challenge of positionality (Moore, 2012). As a Mexican research scholar, I assured that I did not misrepresent the views and aims of this research even with association to the participants (Twyman, Morrison and Sporton, 1999; Herr and Anderson, 2012).

I disclosed my positionality and presented myself as a Mexican PhD researcher from the University of York conducting research in the Yucatán with the aim to find out how solar and wind developments might impact host communities. Additionally, I was reflexive and shifted position based on the necessity of the

situation (for example, from an outsider/observer to an insider/fellow Mexican). This helped enable meaningful engagement with the participants, while also being ethical and culturally sensitive during data collection (Twyman et al., 1999; Given, 2012).

3.5.2 Language and Translation

Interviews in Yucatán, México were conducted in Spanish, the country's national language and the researcher's native language. It is recognised that there will always be some insights and meanings that are lost during translation. This is because the representation of participants' experiences remains bound by the researcher's interpretation and level of subjectivity (van Nes *et al.*, 2010). Consequently, all quotations used in this thesis have been translated from Spanish to English and from Mayan to English, in as much as possible, a way that is fair and closest to the true meaning of the narratives.

3.6 Research limitations

A limitation in this research lies in the qualitative interviews having an inherent challenge relating to self-reported data (Brutus et al., 2013). This means that the researcher is only able to analyse what the participants say as truth, regardless of whether the answers were based on selective memory, attribution (inferring based only on behaviour or limited knowledge) or exaggeration (ibid). However, different sources of self-reported data were triangulated, combining the different sources to check the veracity of particular claims, which allowed for some degree of verification.

A further limitation within the research concerns the researcher´s analysis of the qualitative data, and the ways that it may be influenced by personal interpretations, although supported by literature (Brutus et al., 2013). Moreover, the timing is also a research limitation. I conducted fieldwork when most of the wind and solar projects were approved and in process to be installed. This allowed me to attend a variety of different meetings in a range of different

villages in Yucatán state. Further research should focus on such wind and solar projects already in operation, to gauge their ongoing effects on local populations as well as on consumers of the energy being produced.

Additionally, most of those who were interviewed or engaged informally during participatory observations had attended the different meetings where I was able to attend. The solar and wind projects are located in different rural towns in several parts of Yucatán. It was impossible for my research to cover all the towns and areas of the state, due to time constraints. However, I visited most of the rural towns where RET are to be installed, and there is at least one interviewee from each rural community. Future research can include a team of investigators dedicated to different parts of the state, in order to gain a more complete picture of the dynamics on the ground.

3.7 Challenges and Research Reflections

I embarked on my fieldwork thinking that it would be very difficult to conduct interviews in the field because historically, people from Yucatán are very reluctant to comment on social issues. Instead, I encountered an active civil society composed of scholars from local, national and international universities and a small but well organised indigenous collective group advocating for their rights, both for and against the development, who were keen to take part in my research.

Another aspect worth mentioning is that the year I conducted fieldwork it was an election year in México. Perhaps it was the most spotlighting and contested election so far, because for the first time the left party had a chance to win and they won. During the consultation meeting held by SENER, I heard that some community members were screaming that they do not want political parties in those meetings. I explained I did not belong to any but the skepticism was always present among some community members. To overcome this, I made

sure I wore my university ID and carried out a lot of copies of my project outline in case I needed to prove my identity and motives to conduct research.

Understandably, some organisations contain factions and when people know research is taking place, they may be keen to discover whether the researcher is affiliated to one or other faction (Fielding, 2016). This was the case in San Jose Tipceh, but not only about political parties but factions within the town. This municipality was clearly divided between the people who invited me to attend and the people who asked me to leave. In the face of the possibility that this heated moment could escalate, I decided to leave the town. Immediately I reported everything in my field journal.

I acknowledge it is impossible for a researcher to be independent from cognition, prior experience, understanding, scientific paradigms, and societal influence such as culture, politics and the hot topics that receive funding all affect how research is conceived, conducted, interpreted and used (Fazey et al., 2018). Researchers, including me, are inevitably embedded within, and not separate from, the systems they seek to observe (Guba and Lincoln, 1994). During fieldwork, community members approached me asking me in what way I could help them to protect their lands. I responded that sadly I did not have any power to help them at that moment but perhaps with my research I could increase awareness of what was happening in the state, so more people decided to conduct research stating their reason for doing so was that the research is important. I must admit that I felt touched by their claims, I felt powerless with an urgent need to do something to change injustices. I also felt surprised and I have an even greater admiration and respect for Mayan communities. I saw first-hand how they were organising themselves to create mechanisms to protect their rights. I saw their fear and their bravery to keep going even though history is against them.

On that note, through theories, concepts and findings researchers might also potentially influence society, which in turn reinforces how researchers or the public perceive and approach the world in which they are embedded (Audet, 2014). Thus, research might need to view action, learning and the generation of new knowledge as being more closely intertwined. It places greater emphasis on

the research as a reflective practice and focuses on creating change from within the system being studied rather than viewing it as an external problem (Fazey *et al.*, 2018).

Torres (1992) explains being at the field by using a Mexican saying *"metiéndose al ajo"* (Plunging into the garlic) to describe a challenging situation in which one "throws oneself in at the deep end" in order to acquire a profound understanding of the essence of complex human activity. This metaphor is grounded in two factors: the difficulty of peeling garlic which demands the removal of the skin of the segments, which are closely intertwined, and the lingering smell enclosed within each piece. In other words, it is useful to describe the challenge confronting the researcher when they become involved in the complexities of social analysis. This is the kind of research I wanted to conduct, where being part of the system you are studying includes dipping in and out of action to enable me to enhance learning about practical elements of change, while also providing opportunities for more critical thought and analysis (Midgley, 2000).

Chapter 4 Case Study

4.1 Introduction

This chapter briefly describes the case study investigated in this research. It presents information about Yucatán, México. Section 4.2 begins with an overview of Yucatán´ demographics. Section 4.3 presents details of the principal aspects of the Energy Reform regarding implications of solar and wind projects. . Section 4.3.1 describes the energy sector in Yucatan and section 4.3.2 displays the wind and solar projects. Section 4.4 discusses the ejido, a type of land ownership in Mexico. Finally, Section 4.5 offers an overview of international, national and regional laws interconnected in the development and deployment of solar and wind developments in Mexico.

4.2 Yucatan

The Yucatán Peninsula is located in the southeast region of México (See Figure 4.1), bounded on the north by the Gulf of México, on the southeast by the state of Quintana Roo and on the Southwest by the state of Campeche. The coast of the state comprises a wide area up to 245 km from the coastline. It is located in the middle of the Gulf of México and the Caribbean Sea: two large ecosystems communicated through the Yucatán channel accounting 196 km wide and reaching up to 2000 m deep (Pech *et al.*, 2016). The population of Yucatán accounts for 2.3 millions of inhabitants, being Mérida the capital and the largest city in Yucatán. The National Commission for the Development of the Indigenous Peoples of México (CDI) estimates that the state of Yucatán had 985,549 indigenous people accounting for almost half of the population in the state (CDI, 2015).

Figure 4.1. *Yucatán (source: Yucatán.com.mx)*

Yucatan is a region recognized as a biocultural territory. In other words, it is characterized by the great biodiversity of its ecosystems (see photo 1), intimately interrelated to local cultures, among which the Mayan people stand out, an ancient culture, alive to this day. The Yucatecan Mayan population maintains traditions and knowledge that safeguard and protect the biodiversity of the territories such as the milpa[6], vernacular construction (there are more than 1,600 archaeological sites) and respect for the monte. However, marginalization and poverty are lacerating realities that have accompanied the Mayan population of Yucatán, and that have worsened in recent decades. These have been the result of the two government policies that have been applied throughout history to the Yucatecan Mayan population, colonial segregation and national integration. Both

[6] The Mayan milpa system is a type of low-intensity ancestral agriculture, which, based on practices such as grazing, slashing and burning, establishes crops of corn, beans and squash (Toledo et al. 2003).

constrained the bearers of the Mayan culture to exercise their cultural richness in the strictly local sphere, without facilitating a broad cognitive exchange with the outside. The loss of the writing of the Mayan language translated into one of the greatest disadvantages for those who remained monolingual and also for bilinguals, as it reinforced the isolation and deterioration of the mechanisms of cultural survival (Bracamonte and Lizama, 2003).

Photo 4.1. *Cenote (source: authors' photograph, permission secured)*

Overall, the economy is mainly based on service activities accounting for 67% of the GDP whereas primary and secondary activities represent 3.8% and 28.9%, respectively (INEGI, 2018). Further, the population of Yucatán living in poverty conditions accounts for 40.8% (CONEVAL, 2018). In study of the Yucatán economy, it was found that Yucatán economic sectors are characterised by low productivity in the main economic sectors and branches; employed population with wages and salaries among the lowest on a national scale; low level of

formality of the productive activity; little capacity to generate formal employment; manufacturing production enclaves with little or no technological contribution to the industrial plant; light manufacturing with traditional technology and low productivity; tertiary activities with little generation of wealth; economic activities with little or no link with local sectors, so their impact on growth and generation of wealth is low; sectors with preponderance in the local economy are characterized by their isolation from the productive system, without direct and indirect links with industries (Albornoz Mendoza et al.,, 2015)

The tourist attractions of Yucatan are very varied, constituting an important part of the natural and cultural heritage of the state. Of these, without a doubt, the main one is the archaeological heritage, which for decades has attracted millions of national and international visitors to visit the ancient cities of the Mayan civilization. In the state there are more than 2000 archaeological zones, the main ones by influx and infrastructure for tourist attention: Chichén Itzá, Uxmal, Dzibichaltún, Izamal, Ek Balam, Mayapán, Sayil and Labná. The first two stand out, declared a World Heritage Site by UNESCO. These archaeological sites receive about 2 million tourists annually, making Yucatan the second most visited state for its archaeological sites nationwide (Daltabuit et al., 2007) and the state tourism project promotes the Mayan culture as one of the great local attractions.

This section briefly described the social, economic and cultural aspects of Yucatan in order to provide contextual information to this doctoral thesis.
The next section will discuss the key details of the Energy Reform.

4.3 The Energy Reform

This section attempts to briefly describe the most important characteristics of the Energy Reform focusing on the solar and wind energy projects. However, an in-depth analysis of the implications of the Energy Reform is beyond the scope of this research. The combination of different factors led to the approval of the energy reform. First, the two energy monopolies PEMEX (Petroleos Mexicanos) and CFE

(Comision Federal de Electricidad) operated with lack of transparency in outdated and unprofitable conditions (IEA, 2017). Second, private companies faced significant barriers due to the Mexican market still not completely privatized (Lokey, 2009). Furthermore, 46% of oil company PEMEX's infrastructure and over 30% of the electricity company CFE's transmission lines were considered vulnerable to the impacts of climate change (Prodesen, 2018). As a result, and after years of politically contested deliberation, both chambers of Congress in the Mexican government approved the Energy Reform, which, among other things, represents a complete reconfiguration of the energy sector. Following the constitutional reform of December 2013, by December 2015 the Mexican Senate approved 10 new laws and 12 modified ones. Key new components of new energy are in table 4.1.

Table 4.1 *New Laws from the Energy Reform*

Key aspects of the new Energy Reform Laws
The law replaced the former PEMEX and the new Federal Electricity Commission (CFE) Law, which redefined both companies as 'state productive enterprises' that are subject to normal corporate tax and will pay a dividend to the state.
Established the Coordinated Energy Regulatory Agencies Law in charge of the organisation and remit of the energy regulator CRE and the hydrocarbons regulator CNH.
The Hydrocarbons Law, which authorises and regulates the participation of private actors in the sector via service and profit-sharing contracts as well as "licences" and permits. It also creates an independent system operator for the gas pipeline network, CENAGAS.
A new Law on Environmental and Industrial Safety for the hydrocarbons sector, including a newly created specialised regulatory agency (ASEA).
The Electric Industry Law, which redefines the roles of the energy regulatory

agency CRE in the power sector and separates the transmission grid operator (CENACE) from the state utility CFE.
The Ministry of Finance (SHCP) maintains the right to set certain electricity tariffs, in particular for the residential sector and for agriculture. SENER, in turn, decides on the model of contract for each contractual area to maximise revenues for the nation, after receiving the opinion of SHCP and CNH.
The Ministry of Economy (SE) establishes the methodology for measuring local content in contracts for exploration and extraction of hydrocarbons and verifies compliance with the local content percentage specified by those instruments. SE also formulates and develops general policies in the industry and foreign trade, which have implications for the energy sector.
The Ministry of Environment and Natural Resources (SEMARNAT) is in charge of managing, regulating and promoting the sustainable use of the nation's natural resources, except hydrocarbons and radioactive minerals. It is responsible for regulatory and planning instruments related to the energy sector, in particular in the area of climate change policy

Source: Energy Reform Law.

The reform transforms the governance of Mexico's energy sector (see table 4.2). A number of responsibilities that were the domain of PEMEX and CFE have been transferred to independent regulatory bodies. The scope and pace of the reform have placed pressure on the capacity of government agencies and regulators whose roles have expanded significantly, and which need to have the resources and expertise required for effective implementation (IEA, 2017).

Table 4.2 *New Energy Institutional Framework*

Institutional Government Agencies

Ministry of Finance and Public Credit (SHCP)	Ministry of Energy (SENER)	Ministry of Environment and Natural Resources (SEMARNAT)
In charge of setting the fiscal and economic terms of contracts and bidding variables	Sets energy policies in all areas. In charge of conducting a Social Impact Assessment (SIA) in host communities. In charge of intermediate social contracts between developers and host community members.	Regulates and assess the environmental Impact of renewable energy projects. In charge of conducting a Strategic Environmental Assessment (SEA) of each renewable energy project.
Independent regulators		Operating Companies
Energy Regulatory Commission (CRE)		Comisión Federal de Electricidad (CFE)
Regulates electricity operations		A productive state electricity enterprise

Source: Author´s elaboration based on policy reports

The government of Mexico claims that It is also critical to ensure a smooth transition of responsibilities for energy security and energy data from PEMEX and CFE. However, current investments in Mexico are focused on oil, such as the

refinery Dos Bocas, which as previously outlined, was given an investment of 9.1 billion dollars (Ibarzábal and Bonilla, 2020). As discussed in Chapter 2, equity and energy sovereignty has been limited to the protection of markets, security of supply, and efficiency at the minimum cost (including opportunity and social cost - see Sovacool et al., 2019; Alvial-Palavicino and Ureta, 2017).

4.3.1 The Energy Sector in Yucatan

This section describes the energy sector in Yucatan. The energy generation in the Yucatán peninsula has been developed in the second half of the 20th century through thermal power plants 10 power plants of more than 30 MW developed during this time, of which eight power plants were inaugurated between 1976 and 1992 (Sánchez et al., 2019). During the last three decades of the last century all the energy generation, distribution and transmission activities were in the charge of the CFE. However, the recent four power plants are operated by private companies with installed capacity between 275 and 500 MW.

According to Sánchez et al. (2019) energy consumption amongst Yucatán, Campeche and Quintana Roo shows a certain imbalance with respect to the energy generation. For instance, energy consumption per capita in Quintana Roo was higher than the national average, whilst Yucatán was slightly lower and Campeche was even lower. In other words, whilst Campeche produces approximately the energy it consumes, Yucatán produces most of its energy demand and supplies the energy demand of Quintana Roo altogether (Geocomunes, 2021).

4.3.2 Solar and wind projects in Yucatán

As stated in Chapter 1, the first national auction approved sixteen energy projects to be located in Yucatan. Thus, large-scale commercial renewable energy projects have been approved, most of them would be located in territories where indigenous populations have been established for years (Baker, 2016). In fact, according to the Inter-American Commission on Human Rights (IACHR), 329,000

energy concessions have been granted, covering 35% of the national territory; 17% of those concessions affect indigenous territories (IACHR, 2017).

As detailed in the introductory chapter, in 2016, half of the 18 winning contracts in the first national auction of renewable energy projects were awarded to Yucatán responding to factors such as generation costs and deficit of electricity production in the entire peninsula (see Figure 4.2) (James, 2017). Furthermore, the energy generation is expected to increase, according to the PRODESEN (2008) estimates that during the period 2018-2032, the total of renewable projects in the Yucatán Peninsula will reach 32 projects, including 21 wind farms and 11 solar parks. Additionally, Yucatán has one the highest number of indigenous inhabitants in México. According to National Institute of Statistics and Geography (INEGI) figures, Yucatán has 2,097175 inhabitants of which approximately 40% identify as indigenous (INEGI, 2015). Given the preceding history within renewable projects, it felt necessary to explore renewable energy developments under the new Energy Transition Law. More importantly, this thesis would like to advance the literature to not only explore the processes but also to study the power relations resulting from an important reconfiguration of the energy sector.

Table 4.3 *Summary México round one auctions 2016*

Number	Company	Project	Technology	Capacity (MW)	State	Price in US/MWh
1	ENEL	Villanueva	solar	330	Coahuila	$39.89
2	ENEL	Villanueva3	solar	250	Coahuila	$42.73
3	Sunpower	Guajiro 2	Solar	100	Guanajuato	$43.74
4	ENEL	Don Jose	Solar	207	Guanajuato	$44.58
5	Jinko	Las Viborillas	Solar	100	Jalisco	$49.88
6	Canadian solar/Recurrent	Aguascalientes Potencia 1	Solar	63	Aguascalientes	$50.55
7	Thermion	Sol de insurgentes	solar	23	Baja California	$13.62
8	Sunpower/Vega Solar	Ticul 1	Solar	500	Yucatán	$34.30
9	Jinko	Concunul	Solar	70	Yucatán	$36.25
10	SunPower/Vega Solar	Ticul 1	Solar	500	Yucatán	$36.621

11	Jinko	San Ignacio	Solar	18	Yucatán	$41.26
12	Alarde/Photomeris	Kambul	Solar	30	Yucatán	$46.12
13	Acciona	El Cortijo	Wind	168	Tamaulipas	$49.19
14	Aldesa	Chacabal	Womd	30	Yucatán	$37.68
15	Aldesa	Chacabal II	Wind	30	Yucatán	$37.68
16	Envision/Viva Energia	Energía Renov De la Peninsula	Wind	90	Yucatán	$43.85
17	Consorcio Energía limpia	Tizimin	Wind	76	Yucatán	$44.88

Source Santiago and Sinclair 2017

The justification of using Yucatán as a case study to explore energy injustices are three-fold. First, the increasing number of renewable energy developments that have been approved in Yucatán – a trend that is expected to continue (James, 2017). Second, most of such projects are located in rural areas, which in many cases have majorities of indigenous peoples, who have experienced disadvantages across multiple social arenas and indicators, which might lead to injustices in consultation processes that limit possibilities for expression by normally excluding minorities (Fraser and Honneth, 2003). Third, these projects are developing under the recent liberalisation of the Mexican energy market, and this in turn is leading to a significant reconfiguration of energy governance and its institutions, allowing space for injustices to manifest through social and political structures and institutions that reinforce inequalities (Fraser and Honneth, 2003).

In addition, this research responds to calls for widening attention to the connections between sustainable energy and social justice as a relevant nexus to be studied and understood (Capaccioli et al., 2017). It also responds to calls for a greater understanding of the interaction, politics and contestation of energy justice solutions in particular settings and across the whole energy system (Yenneti and Day, 2016; Forman, 2017). Lastly, it responds to a call to increase local evidence in achieving remedial energy justice for indigenous peoples (Hurlbert and Rayner, 2018).

4.4 Land ownership in Yucatán

The historical analysis of the ejido is beyond the scope of this research. However, in this section I aim to provide contextual insights regarding the ejido in Mexico. During the colonial period, indigenous people could not have their own lands because such lands were assigned to the Spaniards. Back then, indigenous people were exploited to work in the fields to obtain minimum benefits. Arguably, it can be said that officially the Mexican ejido emerged in 1915 with the pronouncement of a Law that declared the concessions made to large landowners null and void. Thus, the land restitution was ordered through the National Agrarian Commission. This law took postulates of the Zapatistas´ Plan of Ayala, which was embodied in the Mexican Constitution of 1917.

In Mexico, more than half of the type of land ownership are ejidos. The ejido is an endemic land tenure model and one of the most important legacies of the Mexican Revolution, the ejido is an area of communal land used for agriculture, on which community members individually farm designated parcels and collectively maintain communal holdings (Appendini, 2008). The ejido have been studied due to its complexity as an agrarian policy (Karst and Clement, 1968), its fragile socioeconomic structure (Cord and Wodon, 2001), the socio-spatial organization (Torres-Mazuera, 2008), its urbanization (Olivera, 2015; Cenecorta, 2000) and its liberalization through the reforms of the Article 27 of the Mexican Constitution (Morett-Sánchez and Cosío-Ruiz; De Grammont, 2001).

Although the ejido, ideologically, seeked to bring social justice to a marginalized group, it also served as a form of political and economic control (García, 2021). Since the reform to article 27 of the Mexican Constitution in 1992 and especially in recent decades, the privatisation and land dispossession have increased rapidly in Yucatán (Torres-Mazuera, 2021). This entails the transformation of the land tenure resulting from processes that combine exploitation of labour and natural resources for the creation of new economic markets. Torres-Mazuera (2021) emphasises that the imposition of public policies that facilitate the integration of natural resources into emerging global markets – such as the

Energy Reform – and the interest of certain elite groups that have managed to collude with authorities and officials in order to seize the domain and/or exploitation of the ejido land.

4.5 International agreements and national policies interlinked with energy developments

This section aims to describe the international, national and state policies and agreements interconnected to the energy transition in Yucatan. As noticed in section 4.2.2, most of the solar and wind energy projects in Yucatan are located on indigenous land and as one of the objectives of this doctoral thesis is to analyse the participation of indigenous communities in the design, approval and deployment of solar and wind energy developments, this section describes que policy mechanisms for participation as well as the international agreements Mexico is part of.

Mexico is a signatory to the Paris Agreement (IPCC, 2015), and it was one of the first developing countries to submit its Intended Nationally Determined Contribution expressing its willingness to join efforts to respond to the impacts of climate change. Some scholars argue that the cost of mitigating CO2 emissions decreased in a transition where electricity generation growth using natural gas is replaced by renewable energies such as solar, wind, hydro and biomass (Islas et al., 2004). As stated in Chapter 1, Mexico has a very ambitious energy policy: increased by 35% of clean energy into the energy mix.

Mexico took an important step forward in its implementation of international human rights law by amending Article 1 of the Constitution in 2011. As a result, international human rights obligations that are incumbent in Mexico are directly applicable at all levels of the federal structure and must be respected and upheld in legislation, public policies and judicial decisions. Such obligations include the International Labour Organization (ILO) Indigenous and Tribal Peoples Convention, 1989 (No. 169), ratified by Mexico in 1990. It also includes the International Convention on the Elimination of All Forms of Racial Discrimination,

ratified by Mexico in 1975. The American Convention on Human Rights, ratified by Mexico in 1981, and its interpretation in the case law of the Inter-American Court of Human Rights; and the United Nations Declaration on the Rights of Indigenous Peoples. In this sense, national and international laws guaranteed the self-determination of indigenous peoples as well as their right to have free, prior, informed and consent disclosure of all developments that could impact their territories.

At a national level, the environmental legislation of Mexico has as its guiding axis the General Law of Ecological Balance and Environmental Protection (LGEEPA), promulgated on January 28, 1988. It is the principal environmental legal mechanism of the country. Within this law, it is mandatory that any company who wants to conduct any activity that could cause an impact should carry out an Environmental Impact Assessment Procedure (PEIA) (LGEEPA, 1988). The environmental mechanism for renewable energy developments within the PEIA is the Environmental Impact Statement (EIA) (SEMARNAT, 2013).

Regarding procedural aspects within energy projects, the Ministry of Energy (SENER) is in charge of evaluating every Social Impact Assessment submitted by the winning enterprises. Such evaluation must take into account the social, political, environmental and cultural characteristics where the project would be built (ETL, 2015). The SIA evaluates if the host territory includes indigenous peoples. However, SENER should assess a social impact assessment to determine if the territory is considered inhabited by indigenous population. Thus, if SENER considers a territory inhabited by indigenous settlements a consultation process should be conducted. When SENER confirms a consultation process would be carried out, then SENER prepares ad hoc protocols on the consultation for specific projects, based on the protocol of the National Commission for the Development of Indigenous Peoples, in collaboration with other relevant federal and state bodies (EIL, 2014).

At a state level, the institution is designed to protect the environment: Ministry of Urban Development and Environment (SEDUMA). Due to the change of government cabinet, this institution no longer exists, it got changed to the Ministry of Sustainable Development. I will focus on SEDUMA because my fieldwork took place when SEDUMA still exists. SEDUMA is an institution in charge of the

elaboration, implementation and evaluation of public policies and actions that promote a balanced development among environmental, social and economic aspects in order to encourage sustainability in accordance with the law. In terms of the involvement of renewable energy projects, SEDUMA participates if a consultation takes place at a determined location. However, SEDUMA has no jurisdiction to affect the deployment of renewable energy projects.

In terms of laws regarding indigenous peoples at a national level, the institution responsible for the coordination, promotion, monitoring and evaluating programs, projects, strategies and public actions in order to guarantee the integral and sustainable development of indigenous population is the National Commission for the Development of Indigenous Peoples (CDI). Accordingly, in 2013, CDI published a protocol including guidelines for the implementation of consultation of indigenous peoples that has served as a guide for some state institutions, although this protocol is not binding. However, national criteria to identify indigenous settlements remain controversial as it is unclear what type of methodology is used by national authorities.

At the state level, the rights of indigenous peoples are legally recognized to varying degrees. The constitutions of 28 out of 32 states explicitly recognize rights held by indigenous peoples and that 26 states have adopted regulatory laws in this area. In the particular case of Yucatan, its constitution establishes in Article 95: “The State will guarantee, protect and promote the social, economic, political and cultural development of the Mayan population”. In the same Article, section IV states that: “In the municipal development planning and programs that derive from them, the municipalities will give participation to the members of the Mayan communities, located in their respective jurisdictions, in the terms established by law in order to promote their integral development, strengthen local economies and improve their living conditions through coordinated actions between the three levels of government with an active participation of Mayan communities.”

In addition, at the state level, the government of Yucatan recognizes the multiculturalism of Yucatan, through INDEMAYA, a policy, inter-institutional and co- responsible institution that involves organizations and entities of the municipal

public administration, state and federal as well as the social and private sectors, with the objective of promoting the social, economic, political and cultural development of the Yucatecan Mayas. INDEMAYA has the responsibility of leading the integration of a Yucatan harmonious and respectful of their differences through defining specific areas for the planning and development of projects, serving as a consulting and advisory body, as well as promoting the projection of the Mayan people both nationally and internationally.

This section described briefly the key international, national and state laws regarding information access, self-determination rights of indigenous peoples, the right to be fully informed about any infrastructural project and the consultation processes under the Mexican Constitution. The next Chapter will analyse the findings of this research.

Chapter 5: Procedural injustices in México

All struggle, all resistance is – must be – concrete. And all struggle has a global resonance. If not here, then there. If not now, then soon. Elsewhere as well as here.

- Susan Sontag

5.1 Introduction

This chapter analyses key aspects regarding participatory processes in the deployment and development of wind and solar projects in Yucatán. Accordingly, section 5.2 discusses key aspects regarding the provision of information of wind and solar developments in Yucatán. Section 5.3 describes the participatory arenas in which host communities are able to participate as well as the spaces they create to participate in decision-making of such developments. Finally, section 5.4 is a summary of the results.

The data used throughout this chapter stems from semi-structured interviews and participatory observation with different actors involved in the development of wind and solar projects. Such interviews were analysed along with policy reviewing of the constitutional amendments made after the Energy Reform and media coverage of events related to the renewable energy projects in Yucatán. In addition, I draw on data from several meetings across the state, in different rural towns, where I observed the behaviours of stakeholders.

5.2 The [in]justices in consultations

5.2.1 Access to information

One important aspect to achieve a just procedural process is access to information (Gross, 2007). In México, in many cases information is difficult to access. In the case of Yucatán, the only way communities find out about projects in their communities is if they check the SEMARNAT weekly online bulletin. As such, if they do not have internet connections, they may not find out about the project until construction is started:

> “I was not aware of any wind project approval in my town, one day I heard big loud machines and I went to investigate where such noise came from, then I saw how big machines deforested our *monte*[7]*”* (Local farmer).

> “I do not know where I can find information about such projects, I believe we should be the first to know about this but I am sure we are the last ones to know” (Local beekeeper).

Furthermore, inhabitants of different towns of Yucatán asserted that access to reliable and relevant information was missing. For example, a common response about lack of information was the absence of key details such as the size and location of infrastructure, full disclosure of payment details and contract as well as the exact earnings of developers in case lease payments are done based on a percentage of profits and the environmental impacts. In fact, community members, local scholars and some interviewees from organisations of civil society echoed what Velasco-Herrejon and Bauwens (2020) findings about developers having a strategy intentionally aimed to provide limited access to data, to ensure lease prices and other benefits remained low in order to avoid further negotiations. The results here suggest that such strategies are not only used by developers but also by government officials who have adopted a similar strategy.

> “I do not like to advertise information regarding consultation meetings, I do my best to keep it between the developers and the community otherwise the process is delayed and we do not want that " (SENER interviewee).

Furthermore, the vast majority of state officials interviewed mentioned that it is not their responsibility to provide information regarding solar and wind projects, which is the responsibility of national agencies, because such energy projects are considered federal projects. Conversely, community members emphasise that the state officials should fully engage with residents:

> “The government should inform us about any project to be built in our town, all of them, from the ejido representative, municipal government,

[7] Monte refers to lowland forest

> state government, they need to ask us what we want for our town but none of them did" (Local woman).

Procedural justice should promote mechanisms to include communities in energy decision-making progress (Jenkins *et al.*, 2014) as well as providing full information disclosure by government and industry (McCauley *et al.*, 2013). However, my analysis shows that host community members do not participate in the decision-making nor the design of any solar or wind projects in the region:

> "When the projects arriving in the state, including developers and infrastructure, are already approved, we cannot do anything nor even evaluate their environmental and social impact. Presumably, all projects should carry out an environmental impacts assessment" (SEDUMA interviewee).

Conversely, an environmental engineering scholar stated that "it is true that projects are approved nationally but it is the state's duty to provide information regarding the impacts of large-scale projects, especially with the environmental conditions of the region". In addition, the vast majority of community members stated that what the government labelled as consultation, is more of a presentation of the project, with little to no information about real impacts on their territories and with no ability for them to influence decision-making of such projects (Rousseau, 2017).

Despite the obligation to consult indigenous people, local academics from lawyers to social and natural scientists interviewed, tended to laugh sarcastically when I asked about information-sharing mechanisms. In fact, some local scholars have organised meetings to provide full information, or "free, prior and informed consent" about the wind and solar projects to host communities (see *Photo 2*). In addition, they also observed that it is not mandatory in any law that the government or developer, must inform citizens about the projects to be carried out within their territory:

> "We have not had a public consultation in Yucatán until we requested it with the help of a member of a community. The reality is that we have to do all the processes to inform the communities. Once they know, we

coordinate with them to gather all the requirements to request a public meeting" (Local scholar).

Photo 5.1. *Scholars providing info about energy projects (source: authors own, permission secured)*

The information provided by SEMARNAT can be consulted weekly in the online Gazette (SEMARNAT, 2013). This poses an important challenge of information access for host communities. For example, many renewable energy projects are located in rural areas which have poor telecommunication infrastructure (INEGI, 2018). In Yucatán 40% of the population belongs to an indigenous community (INEGI, 2015). Whilst a considerable amount of the indigenous community speaks both Spanish and Mayan. Mayan is their primary language (CDI, 2015), yet the Gazette is published only in Spanish representing an important barrier to information access. In this sense, SEMARNAT does not provide essential information with at least the minimum inclusive engagement mechanisms such as a Mayan translation of the potential social and environmental impacts of wind

and solar projects. This implies that SEMARNAT knowingly controls access to information and exercises power over Mayan speaking communities.

Such fractures in procedural justice including information withheld or not accessible to local communities represents a significant injustice and is evidence that the deployment of solar and wind projects is not being carried out in accordance with international laws such as ILO 69. As such, contemporary solar and wind developments are in danger of reproducing inequalities and injustices, rather than recognizing the myriad ways in which societies flourish and deliver multiple forms of individual and collective wellbeing (Castán Broto *et al.*, 2018).

However, there is a possibility that such injustices do not occur due to deliberate obfuscatory processes and instead are due to a lack of clarity about who should be consulted and who the indigenous authorities are:

> “It was difficult to approach indigenous because we did not know who were the indigenous authorities in town, legally there is an ejido president but not all of the community see him as the top authority” (Wind developer interviewee).

Finally, whatever the cause, lack of transparency between stakeholders engenders localised conflicts and the pervasive perception that such developments reify and exacerbate existing procedural inequalities due to an inadequate application of consultation processes. In the next section, I continue exploring procedural justice through the environmental and social assessments which constitute formal trajectory mechanisms of information provision related to wind and solar projects in México.

5.2.2 The new energy framework and its evaluation mechanisms

The themes of institutional change and evaluation mechanisms together recurred throughout the data analysis. Since the Mexican federal government radically changed the country's energy laws in 2013, México is undertaking an ongoing restructuring of its energy sector. As a result, there have been important

institutional changes, accelerating the liberalisation of the energy sector (Baker, 2016).

Stakeholders from local and international NGOs, academics and local communities have a sense that policy makers did not take into account important agrarian and international laws. For instance, one said that the new laws from the Energy Reform are not compatible with existing laws. Indeed, in the Electricity Industry Law (ETL), all energy activities have the criteria of preferred activity. The law states that any renewable energy projects are considered preferred over other economic activities that take place in the territories in question (ETL, 2015):

> "They made the law to benefit themselves, you know, the government and developers. Did you know that an energy project is more important than my right of self-determination?" (Local interviewee).

Perhaps one of the most interesting key issues emerging from the data was land ownership. In México, there are different figures of land ownership; one of them is the ejido. The *ejido* and communal assemblies are contemplated in the Agrarian Law regulated by Article 27 of the Constitution. The agrarian law regulates the form in which the agrarian nuclei must be governed and the procedures that must be carried out to give certainty to the general bases of their economic and social organisation. The vast majority of community members interviewed own a piece of land called an *ejido*. National and international NGOs stakeholders expressed that the new laws have important inconsistencies regarding agrarian law and energy laws:

> *"*The ETL represents a major change by incorporating energy policies aimed at reducing CO2 emissions. Certainly, the national auctions have important limitations, it is the mechanism used by the rest of the world to increase clean energy generation" (International NGO interviewee).

According to the ETL, the criterion of legal servitude implies that landowners will be entitled to receive a consideration from the contractor of the megaproject (ETL, 2015). However, in the event that an agreement is not reached, the developer could promote the figure of "legal servitude" to the agricultural or

district judge, forcing the owner to “reach an agreement”; that is, to rent or sell their lands:

> “In México, there is a concept called legal servitude which forces land owners to sell or lease their land if this one will be used for energy activities. This is the opposite of what the agrarian law says” (Legal local scholar).

> “The criterion of legal servitude and preferential activity contradict the agrarian law, which specifies that only the communal or ejidal assembly make decisions about the communal lands” (Social anthropologist scholar).

In addition, when revising the law, Article 42 of the Electricity Industry Law also offers legal servitude to developers and distributors (EIL, 2014). Therefore, private, public, social or indigenous property is subordinated to energy activities:

> “The new laws from the energy reform unable us as citizens to do anything about them” (Local interviewee).

This implies that these laws contravene host communities´ ability to be a part of the decision-making process of any energy project within their territories. This is also against international laws regarding the self-determination of indigenous peoples.

Another issue that emerged in data collection was the environmental planning mechanisms used to assess the feasibility of renewable energy projects by state agencies and planners. Local scholars and NGOs typically expressed their concern about the relationship between Energy Reform and environmental authorities. There are different bodies and authorities who regulate environmental issues and planning in México regarding the deployment and implementation of renewable energy projects. Some interviewees felt that environmental laws are not adequately reflected at the national scale, creating a risk that the policies have legal gaps in environmental matters:

> “If politicians were serious about transitioning to more environmentally friendly policies, they should have made those policies prioritizing environmental outcomes. Such policies should be designed according to

> the environmental characteristics of each territory" (Local NGO interviewee).

Throughout my fieldwork, organised social society groups and mostly local scholars emphasised the risk of overlooking environmental impacts. It was somehow clear to them that solar and wind projects themselves were not inherently just nor a feasible solution to the pressing environmental issues faced in Yucatán communities. These findings were aligned with the document analysis I conducted with the EIAs and the SIAs. For example, an EIA included the location of the wind farm in Dzilam de Bravo closed to a natural protected area without any mitigating impacts on the ecosystems post-wind farm construction. Additionally, there was no migratory bird's assessment in the three EIAs I reviewed. In terms of the SIA, the study was limited to a cost-benefit analysis of the ejido land without an in-depth assessment of the social and economic conditions of the impacted communities. Moreover, when reviewing the General Law of Ecological Balance and Protection of the Environment (LGEEPA) is the main legal mechanism for environmental protection. This law establishes it is mandatory that any company who wants to conduct any activity that could cause an impact should carry out an Environmental Impact Assessment Procedure (PEIA) (LGEEPA, 1988). The adequate mechanism for renewable energy developments within the PEIA are the EIAs (SEMARNAT, 2013). Many interviewees from communities were unclear about all the procedures involved in RETs, for instance one resident noted that the new institutional framework of the energy sector integrates more institutions to "increase transparency" but makes it very difficult to follow up what institutions do.

Furthermore, the LGEEPA in its Article 40 states that the Ministry of Environment and Natural Resource (SEMARNAT) is in charge of executing public consultation meetings regarding any developments that might affect the population. Some community members were baffled when asked about mechanisms used by institutions regarding the communication of renewable energy information. Despite meeting all the requirements to request a public consultation (See Photo 5.2), LGEEPA Article 41 states that SEMARNAT will decide whether to conduct the requested public information meeting. *If* SEMARNAT decides in favour, the first step for the developers is to release a press statement in a newspaper of

wide circulation in the local area. In this regard, local scholars emphasized the importance of requesting public consultation:

> “Requesting the public consultations allows us to know who is behind such a large-scale project because the law obligates the developer to go to the community. Although it is a joke because they only go once to meet the requirements”. (Anthropologist interviewee).

Photo 5.2 Public Meeting, permission secured

Furthermore, interviewees expressed that the public consultation is crucial because only when SEMARNAT agrees to carry out the consultation then the EIAs are released to the public and to any interested party. After this time, any citizen may submit proposed measures of prevention, mitigation, and written observations. However, as interviewees stated it is up to SEMARNAT to address them or just annex them to the file. However, some local scholars have reported that the authorities did not even include citizens´ observations in the file.

> “Environmental laws in México are vague which make it easy for developers to find loops in their favour. We submitted observations but they did not include them in the files, so there is no evidence of this” (Local scholar).

Local scholars, in particular, were deeply concerned about how the energy transition is taking place. Interviewees also felt dissatisfied with the time constraints. One said, if SEMARNAT agrees on holding a public consultation, any citizen can request the EIA and any person has a period of 20 days to propose mitigation measures and send observations. Local academics and civil

society organizations expressed that they outlined all the perceived inconsistencies within EIA in relation to environmental law and how difficult the process is for communities to be involved in the consultation process:

> “The State makes you believe everything is legal and that your voice is taken into account. We have expressed our concerns following environmental laws and based on scientific evidence of the impacts of renewable energy projects in the region. However, the law is not binding, we are allowed to submit observations but SEMARNAT has no obligation to address them. It looks like a joke but that is the reality of environmental laws in México” (Local scholar interviewee).

According to Rosseau (2017) the haste with which the implementation of the new regulatory framework of the energy reform began, in a highly complex international context due to the drastic fall in oil prices aggravating the risks of the lack of preparation of different stakeholders. This resonates among interviewees from government officials stating that the rapid changes within the energy sector forced them to approach emerging challenges as a “learning by doing”:

> “This is the first time that solar and wind projects are to be installed in Yucatán. We do not have any experience regarding such projects so when we heard that SEMARNAT approved them, we believed the environmental national authority” (State government interviewee).

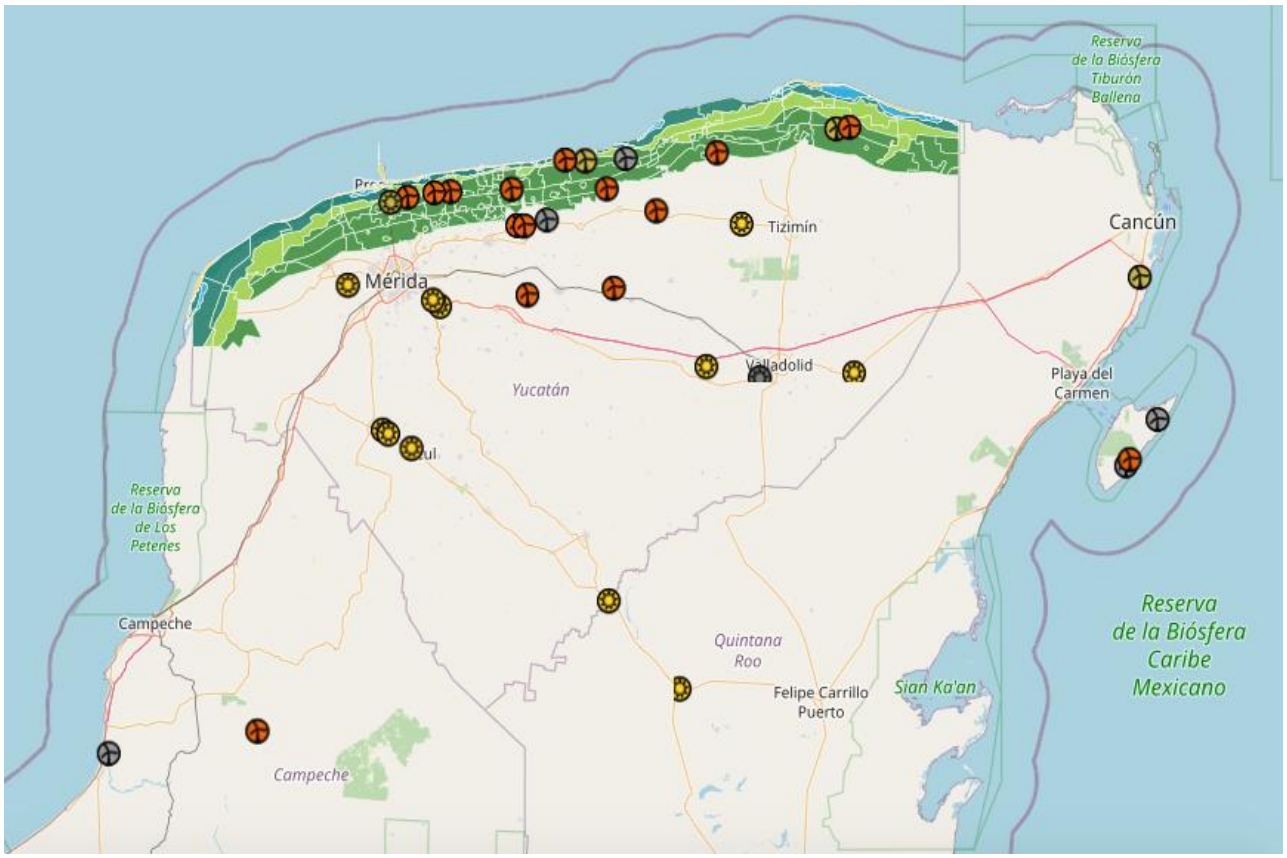
Interviewees from NGOs felt that institutions in México normally tend to follow the laws. However, they raised concerns about how the laws are made to favour certain elites, for instance one interviewee said that it seems that the law is tailored to favour certain people that clearly are not the indigenous population (Villavicencio Calzadilla, Mauger and Fellow, 2017).

Many local scholars emphasized the importance of conducting an environmental strategic assessment (SEA). In fact, such scholars manifested their concern to the State environment (SEDUMA) and demanded meetings to debate the implications of the implementation of solar and wind projects. However, I will expand on this in section 5.3.

To continue, it is worth noting to mention that the Energy Transition Law established in Article 19 that SEMARNAT, supported by specialized public institutions and educational research centres, should conduct an SEA. This should include the relevant characteristics of the ecosystems potentially affected by the projects as well as regionally assess the potential environmental impacts in order to consider adaptation and mitigation measures.

However, local scholars reported, “SEMARNAT has approved several projects without any single SEA. Basically, energy developments and developers are not respecting the law”. Figure *3* shows how wind and solar projects are often located in sensitive environmental areas. When interviewing local scholars and members of civil society organisations, they emphasised that the territorial ecological planning of the coast changed without further discussions. A scholar expert in environmental engineering mentioned that this rapid amendment to the local ordering planning is merely to approve the first wind project in Yucatán, located in Dzilam Bravo.

Figure 5.1. *Environmental Protected Areas (source Geocomunes, 2020)*



Additionally, the ETL established obligations to the Ministry of Energy (SENER) such as carrying out a Social Impact Assessment (SIA). Nonetheless, since the law came into force in 2013 until June 2018, there were no guidelines on what SIAs should include, and this suggests a governance problem (Rosseau, 2017). Among other things, the SIA evaluates economic and social criteria as well as if the host territory inhabits indigenous population, and if indigenous communities

are present, SENER should carry out a consultation in accordance with international laws. This has posed an important challenge regarding the self-identification and self-determination of indigenous population that I will discuss in Chapter 7. Further, some stakeholders from national authorities stressed that renewable energy and indigenous communities are “always a delicate issue and might cause conflicts within communities but I am confident in our laws”.

Whilst the National Commission for the Development of Indigenous Peoples (CDI) is a national institution that orients the public policies for the integral and sustainable development of the indigenous peoples and communities, promoting the respect for their culture and the enforcement of their rights, in practice it does little to protect indigenous rights. For example, as expressed by interviewees, CDI has no influence when it comes to renewable projects. The vast majority of scholars and community members interviewed expressed that the CDI published a protocol including guidelines for the implementation of consultation of indigenous peoples that has served as a guide for some state institutions, although this protocol is not legally binding nor was it taken into account during the policy making of the Energy Reform and its secondary laws.

As stated in Chapter 4, at a state level, there are two governmental institutions designed to protect the environment and the indigenous population: Ministry of Sustainable Development (SEDUMA) and The Institute for the Development of the Mayan Culture of the State of Yucatán (INDEMAYA), respectively. The legal framework of INDEMAYA is based on international instruments such as the ILO 169; national laws in the Mexican Constitution and by state laws of the Constitution of the state of Yucatán. Despite the existence of institutions, it seems that México lacks of coordination between agencies as stated by one interviewee:

> “SENER officials are never in contact to SEDUMA, to the CDI nor to the INDEMAYA to assess community characteristics” (Local agriculture interviewee).

Some interviewees from communities felt that people who are in charge of some agencies do not represent them. For instance, some interviewees mentioned that the governor of the state appoints the person in charge of the INDEMAYA

meaning it is not a just appointment, as he does not belong to any Mayan community:

> “The INDEMAYA is an adornment institution. I mean it is a state institution but they do nothing regarding renewable energy projects and indigenous rights” (Craftswoman interviewee).

These participatory mechanisms (consultations, public meetings) through closed spaces controlled by elite groups have caused conflicts within the host communities. This section has highlighted that there is no meaningful participation where community members have influence on the design or implementation of such projects in their territories. These ambiguities in legal mechanisms of assessment and participation have caused civil society, local academics and host community members to organise spaces to debate the current implementation process of solar and wind energy in Yucatán.

Furthermore, the regulatory framework of EIAs is highly technical, costly and difficult to access. This study agrees with previous findings that procedures for licensing developments make it more difficult, yet not impossible, for low-income communities to resist renewable developments (Clough and Bell, 2016). This suggests energy infrastructure may shift to areas of less regulation and less participation. In addition, evidence here suggests that projects are more likely to be approved in areas, which are known to be systematically under-represented in formal planning processes (Roddis *et al.*, 2018). Thus, lack of information disclosure from developers and national authorities is an urgent issue to be addressed (Yenneti and Day, 2015) using mechanism of inclusion based on local knowledge, greater information disclosure and better institutional representation, as denying the ability to affect decisions might be taken as inevitable progress (Heffron and McCauley, 2014; Islar, Brogaard and Lemberg-Pedersen, 2017).

These sections demonstrated that the energy reform and the secondary laws clearly overlap with agrarian and international laws. The restructuring of the energy system highlights the state of environmental laws in México. The results suggested that environmental laws are lacking mechanisms to guarantee compliance. Moreover, it provides insights on the fragmented relationship between government and civil society. As a result, indigenous communities and

civil society are organising to demand the right form to be taken into account in shaping a just energy transition. The next section will expand on participatory spaces demanded by local communities and social organisations.

5.3 Recovering Participatory Spaces

This section will draw upon data collected during different meetings. I attended meetings organised by indigenous communities, another one organised by local scholars demanding debate with state authorities, a consultation meeting held by SENER as part of indigenous consultation and a meeting convened by indigenous communities with local scholars and local NGOs.

5.3.1 Alliances

Perhaps one the most interesting finding throughout this research is the important alliance between local scholars and community members to advance participatory mechanisms taking into account that some of such spaces of participation are often shaped by power relations (Cornwall, 2002; Gaventa, 2003). I encountered a few local scholars who were concerned about the lack of information about fast approval of RET projects. This echoes the activist lens of energy justice and the results here advances findings of Bedi, (2018) where activists aid the energy discussions beyond dominant government officials and international corporations. In this study, energy justice activism centres on concerns of energy justice and ecological protection, whilst taking into account climate change considerations. Through this and previous chapters, the results illustrate that energy justice activism in Yucatán centres on the need to include accurate spaces of participation where people can influence decision-making whilst respecting ecological protection, cultural matters and the self-determination of indigenous peoples. Such spaces of participation should include impartiality and full information disclosure and culturally adequated engagement mechanisms (McCauley et al., 2013; Todd and Zografos, 2005).

The local scholars, with some people from the communities, requested public meetings in order to obtain and scrutinise the EIA of the project to analyse it (see Photo 5.3).

Photo 5.3. Local scholars analysing EIA (permission secured)

These academics outlined all the perceived inconsistencies within EIA in relation to environmental law and how difficult the process is for communities to be involved in the consultation process:

> "There were no consultations here in Yucatán. Government authorities do not fulfil their duty to inform citizens about infrastructure to be installed in the region. When we found out about the arrival of almost ten large-scale energy projects without proper planning and information disclosure, we decided to get together and analyse such projects. We encountered several challenges along the way but also, we found other local scholars having the same concerns. More importantly, we also found local community members worried about the impacts on their livelihoods. Thus, we decided to organise ourselves and request information and participatory mechanisms in the RET decision-making" (Local scholar interviewee).

The role of this group of academics has been imparting important knowledge and advice, and ensuring communities affected have access to impartial information by connecting energy schemes with participatory processes. They have also

performed a facilitative role by improving the capacity of organisations between local communities and the state. Nevertheless, even these academics faced some challenges. For example, they stated that the process of requesting a public meeting is perhaps, deliberately difficult and has a cost associated with it:

> “Previously, SEMARNAT only required an ID and proof of address. Recently, they are asking the requested member for a letter of residency and a proof they have paid the council tax issued by the county council and this costs money and time to do it. It seems they do it on purpose for us not to have a chance to review the MIAs” (Local scholar interviewee).

Once the academics obtain the EIAs, they share it with community members of the community. However, they (community members) are not necessarily able to understand such documents:

> “The EIAs are almost impossible to read, they have millions of pages with some words I do not understand, I have no time to read what would happen to my community with a renewable energy project” (Indigenous woman interviewee).

Overall, views on whether the consultation processes achieved procedural justice were converging. On one hand, developers and authorities agreed that the implementation has been difficult due to lack of clear approaches to communities and lack of resources. On the other hand, information has not been free of coercion, transparent and with appropriate mechanisms of participation accurate for any given community.

Since the first meeting I observed how indigenous communities were organising themselves to distribute information regarding developments in their towns. During their meetings, they were leading everything, from deciding who is invited, the order of participation and the logistics. Then I observed how they protect their own spaces. They chose their allies based on trust. They prefer to engage with local scholars that have no hidden intentions regarding the renewable projects. This was especially evident when national environmental organisations arrived in their towns trying to invite them to their meetings, but were met with cynicism and mistrust of such invited spaces:

> “Those big NGOs have an agenda, they get their funding through national and international programs, they do not want to build with us, they want to build upon us, they are also an imposition” (Community interviewee).

As I discussed previously, they chose their allies very carefully. I was invited to the meeting after two interviews, one from an international scholar who conducted fieldwork in the state who put me in contact with local scholars. The second interview was with Pedro Uc, one of the main organisers from indigenous communities. At that time, in 2018, community members were organising with the objective to defend their territories. Today, that organisational process led to a movement involving indigenous people from several rural towns of Yucatán, their collective is called Muuch Xiimbal and has developed important activities aimed at defending indigenous rights and their territory.

Back then, during fieldwork, the meeting with Pedro Uc was crucial to gain access to the other meetings organised by indigenous communities. This meeting was held in a coffee shop in Mérida, the capital of Yucatán. I arrived on time and Pedro Uc was waiting for me. I introduced myself and handed in the ethics protocol, which he asked to take home. He was asking me questions such as where I was from, where I studied and after that, he asked me about my research project. He seemed satisfied with my answers and I emphasised I came from the University of York, in the UK, and that I will follow the ethics rules from my institutions. He mentioned “sorry for the questions but these days you do not know who you can trust, especially with this green capitalistic economy”. After this, the interview began and ended when I was invited to the meeting to take place three days later.

During the meal of this meeting, I asked them how indigenous groups and scholars met and how they organised the meetings. In a completely friendly atmosphere, community members outlined the essential role local scholars have had in helping them to navigate the difficult and often obscure processes:

> “They are helping us to understand this chaos with government institutions as well as helping us to obtain information in government websites regarding these megaprojects”. (Community member interviewee).

> “They are also helping us to understand the legal terms and how the law can help us to protect our land”. (Community member interviewee).

A more skeptical member emphasized: *“*There are people and NGO with an agenda, we do not trust them, and they work for powerful people so we need to be extra careful about who we trust”. One of them even made a joke about me: “we have to google you and evaluate if we can trust you and you are here so you passed the test”.

In the same vein, local scholars observed that there are national and international NGOs who have funding but they have an agenda incompatible with indigenous rights. One of them expressed:

> “There is a document analysing the current status of renewable energy in Yucatán. The funny thing is that the same consultancy group that helped to write the Energy Reform made it. When we read it, we saw that the stakeholders from the study were mostly government authorities and developers, the smallest number of stakeholders were people from the community”. *(Local scholar interviewee).*

Whilst the above quotes indicate that there was a deep unease about the intentions of different actors involved in the renewable energy developments, and groups who were apparently attempting to ai indigenous people, it was not always the case that intentionality was the root of the issue. For some interviewees, a key concern was the procedures large organisations used to try and “engage” indigenous people or create opportunity spaces for renewable energy developments in Yucatán. For such interviewees, the mechanisms used by such organisations failed to take into account the needs, wants, rights, knowledges or rights of local communities:

> *“*Maybe those big organizations might not have hidden intentions but the approaching mechanisms are not accurate for locals. Actually, at the very end, if energy projects are needed in communities, that initiative should start in the communities, otherwise it is the same imposition they have been experiencing for decades” (Civil Society Interviewee).

The alliances between indigenous communities and local scholars also facilitate the engagement of other social civil organisations (for example, environmental organisations, women collectives, human rights advocates). The results here suggest that inadequate procedural mechanisms led to what Pesch et al (2017) describe as advocacy movements claiming to include underrepresented stakeholders in the design and planning of energy policies. The next section will analyse power dynamics within solar and wind developments in Yucatán.

5.3.2. Spaces of disempowerment

As noted in Chapter 2, procedural justice refers to who participates in decision making, how those decisions are contested and how impartial such processes of participation are (Sovacool and Dworkin, 2015). However, little work on procedural justice focuses on the flows of power within and between participatory processes. As such, this section uses the power cube (Gaventa, 2003) to understand spaces for participation shaped by power relations among key stakeholders. In this section, I explore the different types of meetings within renewable projects. During fieldwork I was able to attend to indigenous meetings organised and run by them; meetings organised by academics where they demand state authorities to debate renewable developments, meetings organised between indigenous, academics and local NGOs and to the consultation meeting carried out by SENER in a host community.

Members of the community San José Tipceh invited me to a consultation meeting run by SENER. The meeting took place on a Sunday morning in the main square of a little town. The main square was ready; developers orchestrated a scenario allocating chairs for the audience and a panel at the front for national and local authorities. The main square had empty seats. Some members of the community remained standing up at the back. Some others were on the side. Women and their children remained aside but close enough to witness the meeting. The seats were taken mostly by middle aged and elderly people.

On one side of the plaza, there was a place with food and drinks for the attendees. From far away, one could hear music emanating from large speakers and from time to time, a representative of the Institute for the development of Mayan Culture (INDEMAYA) invited the residents to the meeting in Spanish and Mayan. Little by little, people were filling the empty chairs. The meeting started two hours later than it was expected. I sat in the middle to observe how the meeting was conducted.

The consultation started by introducing all authorities. Suddenly, a group of people sat in the back explicitly yelled: *"*We do not want outsiders, they are coming for electoral reasons, they need to leave or we will kick them out; who are the outsiders? What do you want from us? You will disturb this meeting, kick them out of here".

The authority from SENER addressed those claims by asking all attendees if they would agree to ask me to leave. Interestingly, the authorities only gave the microphone to those who were yelling but not to those members of the local community who had invited me to the meeting in the first place. The locals who had invited me requested a chance to introduce myself and fully explain why I was interested in the proceedings before everyone made a decision on whether I could stay or not. More than 40 minutes was spent with people arguing, passing the microphone and shouting if they would allow me to explain who I was and what I was doing during the consultation processes. I observed how the community was divided as well as the evident tensions amongst individuals. Some of the yelling between community members was *"*You have no land, you have no rights to say anything; you do not want the business man to give us money, you are jealous". Other members counter-argued, "I have rights, I have international rights if the government decides to undercut me, and I have rights as an indigenous person; they are not telling the whole truth and how the project will impact us".

The new energy policy took place in a closed space meaning that decisions are made by a set of actors behind closed doors. Such participation spaces are also

known as “provided” within the state, in the sense that certain elites make decisions for the citizens without the need for broader inclusion or involvement (Gaventa, 2003). Furthermore, the consultation held by SENER, represents forums in which indigenous peoples participated took place via the structures described in the institutional and state laws. In this case, meetings occur in an invited space where the developers and communal presidents invite landowners to inform them about the project. This type of space is considered as efforts made to widen participation where various kinds of authorities invited people to part of the discussion (Cornwall, 2003). Nonetheless, in Yucatán it appears that the current laws enabled little deliberation among attendees. Rather, interviewees describe what seems to amount to as a tick-box requirement to obtain the permits (Yenneti and Day, 2015; Dunlap, 2017a; Velasco-Herrejon and Bauwens, 2020). Unsurprisingly, citizens felt distrust of the authorities.

When interviewing community members from different localities, the vast majority observed that if the developers organise meetings to inform about the project, such meetings included food, some toys for children as well as school supplies. The content of those meetings was mostly based on climate change arguments to justify the necessity of solar and wind projects within localities. Not a single community member expressed that information about the size of the project, the contracts and the environmental impacts were discussed. In some of the meetings run by developers the question-and-answer section was limited and according to other community members, in some meetings there was not a Q&A section. Moreover, some community members emphasized the meetings were held in Spanish rather than Mayan, and not all community members were familiar with technical vocabulary.

> “They told us that a turbine will generate electricity and that our energy bills will be reduced but they never told us about environmental and social impacts” (Local interviewee).

This evidence suggests that consultations regarding renewable energy developments lack transparency and appropriate mechanisms of participation. Not only do indigenous people lack the ability to influence decisions, but also, they have no incentives to be involved in social issues because they feel

powerless even in spaces created for them. This has caused protests against RET developments (See Photo 5.4) As I will argue in the next section, however, indigenous communities have claimed their own and that their rights should be respected.

Photo 5.4 Protest against energy developments, permission secured

5.3.3 Claiming spaces

During meetings organised by local scholars and community members where state authorities were invited (see *Photo 5.5*), I had the opportunity to observe how different actors interact regarding renewable energy developments.

Photo 5.5. Meetings organised by community members and local scholars, permission secured

In this meeting, local scholars with community members requested State authorities to debate about the potential impacts of these projects in the Peninsula, in particular the impacts on indigenous communities and their land. Attendees included officials from SEMARNAT, SEDUMA, academics from national and international institutions, NGOs, industry members and community members. Such claimed spaces emerged out of common concerns where local scholars and community members reject hegemonic spaces and create spaces for themselves (Gaventa, 2003).

The meeting began with local academics' presentations, from anthropologists, human rights experts, chemical engineers, physics and environmental engineers. After these, a SEDUMA representative took the stage offering possible solutions to the mentioned issues. The speaker stated, "a possible solution could be to run an environmental observatory. Such an observatory would have a board of people from different government institutions". The public reacted contemptuously, some of them laughing, some of them eye rolling. A community member yelled "But that is the problem, you are the problem, the solution cannot be the problem". It was clear that the "power" within this meeting lay not with government authorities nor developers' representatives. In opposition to public meetings and meetings organised by developers, this meeting was not unilateral or the one-way transmission of selected information from elites. Indeed, there were exchanges of views from different stakeholders, it was clear how community members felt in charge when their voice was the first on the agenda.

When the head of SEDUMA spoke (see *Photo 5.6 and Photo 5.7*), he emphasized that in fact environmental assessments should be carried out in a better way but he also added, "Who is going to do it? We do not have unlimited resources". When he said that, the head of SEMARNAT laughed at her notes, moving her head in a way it could be interpreted as a moral superiority towards academics and community members.

Photo 5.6. Head of the Environmental agency in the meeting organised by community members and local scholars, permission secured

Photo 5.7. Environmental agency representative in the meeting organised by community members and local scholars, permission secured

After the meeting, I interviewed civil society, one of them said that “Look at the SEMARNAT representative; she came here to laugh and to imply we cannot do anything". In the same vein, a community member expressed “at least we are trying to do something, they have the power and do nothing but benefit themselves and their business friends”.

A significant number of community members raised their voices questioning how renewable projects could lead to land dispossessions. In addition, they questioned the process and the business model adopted by national authorities. More importantly, some of them demanded their right of self-determination, free of coercion consultations. The government authorities nodded with their heads and observed that certainly the policies should emphasise the role of indigenous

communities. However, government officials also stated that they are not able to change it, especially at that moment when it was election season. During the meeting, local scholars from different disciplines echoed the need of rethinking the energy transition beyond a mere technological change.

Additionally, in this meeting the academics questioned the rapid approval and some EIAs as well as pointing out indigenous rights violations. Even though the head of SEDUMA acknowledged the evidence presented, he emphasised that the state ministry does not have a say when national authorities conduct the consultations. A number of stakeholders noted that there was a lack of clarity as to whom should be consulted, which authorities represented the indigenous communities, and the capacities and resources of the institutions responsible for carrying out consultations. Current consultation processes are seriously hindered by the lack of trust and mutual understanding between the parties.

During this meeting, officials responded they have limited influence and resources, as the regulatory framework does not allow them to do much. In contrast, scholars claimed that this passive approach is due to a lack of political will against industry member's pressures to conduct business in the state. At the end, officials acknowledged the environmental and human rights violations in energy projects but did not offer possible actions to be taken to mitigate or prevent such violations in present and future projects. The meeting concluded with authorities asking local scholars to produce a final document with a proposal for renewable energy in Yucatán. At the time of writing, the ruling party changed, SEDUMA was replaced and changed its name to the Ministry of Sustainable Development and no mitigation actions have been conducted thus far.

I was invited by a community member to a meeting organised and run by indigenous population from different municipalities of Yucatán. The attendees had common renewable energy developments in their communities. This meeting aimed to express all the trouble they were facing and to discuss ways in which they can defend their own territory. The vast majority of attendees were indigenous and just a little part were academics and few local NGOs members

who were there to listen to everyone, and at the end, international indigenous rights were discussed.

They constantly highlighted that developers asked them what they needed out of the blue and most of the time the only thing that came up in their minds was money but most of the time they did not feel comfortable enough to say it. For example, the lack of accurate spaces to promote debates regarding energy infrastructure propitiate that participants lose interest and end up accepting what they have been offered. As one local farmer claimed: “I went there because they were offering food and drinks but I did not participate in any debate, they were not asking us anything. At the end they do whatever they want”. As a result, indigenous communities have claimed their own spaces in alliance with academics and local NGOs to protect their rights. This meeting lasted an entire day, I was able to share a meal with different community members in a respectful environment. Certainly, there were two main organisers but the entire conversation and debates were inclusive and horizontal. The attendees spoke freely about their concerns and the potential ways to protect themselves and their territory.

In a meeting requested by indigenous members with the participation of academics and NGOs, more in-depth legal strategies to face injustices were discussed. During this meeting, NGOs were discussing legal actions to possibly halt these developments. Indigenous members were discussing strategies to facilitate information to other communities affected. Whilst academics were suggesting to prioritize ways to increase awareness of possible impacts of large-scale developments. The participation in this type of meeting was well organised and it was not necessary for a person to lead it.

This section illustrated how indigenous communities, local scholars and social organisations have claimed spaces to participate in decision-making of RET in Yucatán. During the meetings, allies and experts on international law, anthropology, human rights, amongst others, addressed all questions from community members. I was able to observe that for indigenous members not every person is trustworthy. They feel comfortable when they lead the meetings,

when they are a priority, in their own language and in their own spaces. Some of them mentioned that authorities and developers constantly patronise them. Perhaps the success of the alliance relies on how the horizontal relationship between local scholars and indigenous communities is grounded on respecting their autonomy, knowledge and capabilities. However, whilst such claimed spaces are empowering, this section has also outlined the limits to that power, when considering the formal invited spaces of the officials, developers and regulatory schema.

5.4 Concluding discussion

The findings illustrate that achieving procedural justice requires not only detailed information and the ability to affect energy decisions but also accurate engaging mechanisms, which value local knowledge and respect the customs of indigenous peoples (Yenneti and Day, 2015; Castán Broto *et al.*, 2018; Velasco-Herrejon and Bauwens, 2020). Arguably, failure to include such aspects of procedural justice in the implementation of renewable energy projects in upper and lower-middle income economies with large inequalities such as México might be problematic due to the possibility of widening such existing inequalities. Procedural justice would also require local community capacity building to widen participation from different stakeholders in order to avoid government and developers acting to exercise traditional power structures. However, insights from organising energy communities in high income countries such as the United Kingdom showed that this community initiative presents difficulties in creating common visions and achieving social actions (Baxter et al., 2020; Vuichard et al., 2019; Parkhill et al., 2015). Therefore, this might be a problem in an economy of any size but particularly lower income countries or countries with higher incomes but large inequalities.

The current situation of indigenous peoples in Yucatán shows that there is a significant gap between the legal, political and institutional reality and the country's international commitments. This gap continues to widen, especially because of the development model that underpins the energy policies which has a major impact on indigenous territories in Yucatán. Therefore, there is an urgent

need to sharpen governments, legislatures and civil society organisations to promote more grassroots spaces for inclusive and meaningful participation where indigenous peoples take the lead of their decisions regarding energy infrastructure.

Indeed, this analysis aided by the conceptual “power cube” tool, has shown that equity in energy systems can best be enhanced by shifting decision-making powers away from the elites and towards citizens, and by ensuring adequate spaces for exerting public pressure and exercising scrutiny over officials and their decisions (Fung, 2006). Furthermore, within the context of low-carbon energy transitions, it is vital to advocate inclusive participation for governing changes within complex socio-technical systems (Chilvers and Longhurst, 2016; Gillard et al., 2016) More importantly, the use of the power cubes identifies that power is not static. In fact, power flows depending on the type of spaces (Gaventa, 2003). For example, the meetings organised by government officials were identified as an invited space where attendees had little room to raise concerns regarding the deployment of solar and wind projects. This was the opposite when scholars and community members demanded to environmental authorities a meeting to discuss the potential impacts of such projects. This meeting was not unilateral because all members expressed their concerns and the authorities had to address such claims. The authorities attempt to address those concerns albeit in a limited way by not offering concrete solutions to their claims. As a result, community members, local scholars and civil society organisations organised themselves to take legal actions. At the time of writing many energy projects are cancelled or suspended due to lawsuits.

Building on such insights, this chapter has shown, that if México seeks to transition to a low carbon energy system it should include less-heard voices, particularly those of impacted indigenous communities, into the energy decision making to secure fair and equity outcomes (Yenneti and Day, 2015, 2016; Yenneti et al., 2016; Damgaard et al., 2017; Velasco-Herrejon and Bauwens, 2020). More importantly, impacted communities need to be included in inclusive participatory processes based on mutual respect and where stakeholders have

the opportunity to scrutinize and to influence outcomes; ultimately this would help to legitimise decisions (Dryzek, 2012; Huesca-Perez and Sheinbaum-Pardo, 2016; Dunlap, 2017a).

Overall, the findings here focused on the alliance between academics and indigenous, agreed with the small body literature on energy justice that acknowledges the importance of energy intermediaries because they connect local projects with a wider understanding of energy issues, sharing learning and working towards a more inclusive decision-making participatory processes (Bedi, 2018; Lacey-Barnacle and Bird, 2018; Lacey-Barnacle et al., 2020). The important alliance among scholars and indigenous communities and civil society is a bridge that links creating a solid opposition providing expertise and respect for indigenous customs by creating spaces to contest persistent power and resource imbalances (Gaventa, 2003; Jenkins *et al.*, 2016; Gillard et al., 2017).

The local scholars have an important connection with members of the community; their approach involved the awareness of indigenous rights, the ability to communicate complex issues via a simple language, acknowledging particular community characteristics and the willingness to listen to community concerns and claims. As discussed in Chapter 3, there were no issues of multiple identities in this study. All local scholars identified themselves as not indigenous. This chapter has argued that the groundwork should be laid for a sustained and inclusive dialogue with indigenous peoples that builds the trust that is needed to establish a new relationship between indigenous peoples, civil society, industry and the State, based on equality, respect and non-discrimination.

Chapter 6: Distributional justice

My utility may not only depend on what I get but on the manner in which I get in. That is my utility may not only depend on the consequences of policy but on the policy itself.

- John Stuart Mill

6.1 Introduction

As discussed in Chapter 2, distributional justice within the literature on energy justice refers to who is bearing the cost and who is getting the benefits, in this case, of solar and wind projects in Yucatán, México. Normally, renewable energy developments can supply benefits to host communities through community benefit packages to landowners through land rental agreements and to local authorities through the accruement of business rate (Burke and Stephens, 2018). Distributional justice within solar and wind projects have been overlooked and this may be due to the misconception that such projects are socially good and hence inherently just. In this section, I explore distributive justice in Yucatán related to solar and wind large-scale projects. Accordingly, Section 6.2 analyses the unbalanced negotiations of land lease and infrastructure development in host communities. Section 6.3 explores the potential job creation through wind and solar projects. Section 6.4 analyses in detail the processes to acquire land to build solar and wind projects. Then, Section 6.5 discusses the final end of the energy generation through these developments and Section 6.6 argues how national energy policies might impact local communities and their environment. Finally, Section 6.7 provides concluding remarks.

6.2 Infrastructure development

At the time of writing this thesis, there are 28 renewable energy projects to be located in Yucatán, 17 wind projects and 11 solar developments which accounts for 24,787 hectares (Sánchez *et al.*, 2019). These types of projects are expected

to bring infrastructure benefits to the host region. In this section, I explore some findings regarding improvements of infrastructure development in host communities.

As noted above, renewable energy developments can supply benefits to host communities (Burke and Stephens, 2018), however, little is discussed about the possible dis-benefits of hosting such large-scale projects. The results here differ with European studies where changing the landscape represents challenges to the acceptance of RET (Gross, 2007; Parkhill *et al.*, 2013; Scognamiglio, 2016; Roddis *et al.*, 2018). The results here showed a few concerns regarding the aesthetics of the landscape related to energy infrastructure.

The interviewees were keen to discuss with regard to whom these benefited. Currently, in Yucatán there is information available on 17 wind projects and 11 solar projects. Such availability of analysed, systematized and georeferenced information is the result of a project in conjunction with local academics and the collective Geocomunes[8].

Study participants from communities' state that *"*developers promise building parks and schools for children, health centres and cultural activities if they get consent to start renewable parks". Perhaps what community members agree the most is that they do not see any advantage of such developments. Ejido members of Suma de Hidalgo managed to request the lease contracts because the developers acquired their signatures with dubious processes. Such contracts include the clauses of the land lease clarifying how much ejido members will be paid. For instance, the lease contract described that the payment of the land is only for the surface of each wind turbine separately. This alerted some ejido members, one of them asked his nephew to look for help to get those contracts. A few weeks later, community members were able to see the contract and with help of a lawyer friend found out what they called during interviews, outrageous clauses:

> "The developers told us that we will receive 90 thousand pesos but they did not clarify the periodicity. In addition, they did not specify that the

[8] The information and maps can be consulted in https://geocomunes.org/Visualizadores/PeninsulaYucatán/

> money will be divided amongst all landowners from the ejido. We found that the amount will be every six months and divided between more than 200 landowners, which will account for 30 cents of a peso per hectare per year. That is outrageous; we cannot buy anything with that amount" (Local farmer interviewee).

As I discussed in Section 3.6, I conducted fieldwork in a particular time in the electoral history of México and I noticed the impact of such when analysing the data. One of the campaign slogans of the current president, Andrés Manuel López Obrador, was "for the sake of México, the poor first". I observed how some community members felt hopeful about new elected authorities while others felt that "México will be the same no matter who is in power". Some of interviewees observed that the solar and wind power projects arrive with a good timing:

> "The town is divided, on one side we have electoral propaganda giving us gifts along with promises to build roads, hospitals and schools. On the other side, we have the energy developers promising almost exactly the same thing. Both of such promises in exchange of our vote and signature" *(*Local farmer).

> *"*We do not need roads; the foreigners need roads to get to our land. Energy infrastructure is not for us either, it is for the government and for business men" (Local woman interviewee).

When I interviewed state government authorities about implementation of these projects and the potential infrastructure development, they acknowledged, "there will be various benefits for host communities, roads will be built, parks and economic growth". However, SEDUMA officials argued that due to electoral times they cannot advance any debates around the implementation of RETs and often said *"*We cannot do much because of the election; this period is a dead period". In the same vein, local academics felt uncertainty about these projects and their claims to their social and environmental impacts. One of them said, "You never know who is going to win elections, what party they are from and what kind of policies they will promote".

Undoubtedly, the elections slightly affected interviewee's responses. For instance, at the beginning of a consultation meeting, some community members were yelling, "We do not want political parties here". Others expressed that during the electoral season, the government takes advantage of infrastructure projects promising affluent economic development. A community member said, "The government only remembers us when they want our vote, the rest of the time we do not exist for them".

Overall, the fieldwork occurred without any major issue related to the elections. However, I sensed a heated atmosphere when community members and government officials were in the same meeting room. I observed a broken relationship between State and civil society and a general feeling of disappointment towards government officials. This might be a result of a perception of years of consistently disinterest from the Mexican government towards indigenous communities.

The sentiment of most of the community members I interviewed felt scammed regarding the benefits of such projects. Some of them felt that developers took an assistentialist role. An indigenous woman from Dzilam Bravo expressed that developers approached women of her community offering a cultural house for them to create craft embroidery, at first, she stated, thought it was a great initiative but when discussing among them, some said that they do not like doing embroidery. When interviewing three women at the same time as they felt more comfortable to do it that way, they asserted that "imagine if someone forces you to change your personal career to a whole different one, that is the problem with foreign businessmen, they like to decide for us and I believe it is not fair".

In the town of Motul, locals emphasized that developers offered roads, new parks for children and equipment for hospitals. A young man stated reluctantly that "they are just like politicians in campaign, they promise a lot of projects, economic growth but there is not a single guarantee of that". In addition, local scholars and local NGOs asserted that developers cannot meet what they promise due to the legal clauses of the leasing contracts:

> "The contracts explicitly established that the developer can sell the project whenever they want and the buyer might or might not develop promised

> infrastructure, ultimately developers promise a lot of infrastructural projects without any guarantee because there is no process monitoring from the government" (Local NGO interviewee).

Others described that providing quality goods and services is what the government is supposed to do. In fact, a community member linked the role of the government to what developers promise by emphasizing that "it is not surprising that private developers are colluding with government authorities because one promises to the people what they neglected to do for our people". Overall, community members from different host communities agreed on what an indigenous woman said "they are giving us so little and they will make an outstanding profit out of these machines in our territory, I do not see how that is fair at all". Other community members suggested that developers behave in a paternalistic way stating that "the developers arrived in our town and offered us food, money, scholar supplies for our kids; it is similar to what politicians do during the electoral season, they never ask what we need".

Civil society interviewees agreed that these large-scale projects heavily damage the environment and the ecosystems within. A vast majority of residents interviewees expressed their concerns regarding big developments to be built close to natural protected areas (See Photo 6.1).

> "Developers promise a lot of roads, parks and schools in exchange to deforest our land, they do not care about the bees or the people we live thanks to the products of our bees" (A local beekeeper).

Photo 6.1 Wind project located close to a natural protected area

In the same vein, local scholars and local civil society organisations emphasized that the EIAs lack accurate environmental assessments regarding the potential cumulative impacts of solar and wind infrastructure developments, they emphasised that all of the information is desk based and the SEMARNAT approves them.

As discussed in Chapter 4, the arrival of such projects has raised concerns regarding procedural justice but it has also raised environmental concerns amongst host communities as well as citizens of the region. Thus, some communities have protested against such developments emphasising solar and wind infrastructure would destroy the ecosystems they use in their daily life:

> “We appreciate even those fruitless trees because we enjoy the shade, our animals’ benefits from that shade too; those bushes guide our bees;

> our birds have memory, they sing 7 times upon that tree and that means the rainy season is about to begin. The government and developers think in terms of money, we think our natural resources have no price" (An elder farmer interviewee).

Though there were several proposals including infrastructure development in host communities, there was no mandatory obligation for the developers to implement them and from my visits to communities where the wind solar was already built, I observed that no facilities had actually been provided or begun. These results echoed case studies in Oaxaca (Howe et al., 2015; Siamanta and Dunlap, 2019; Velasco-Herrejon and Bauwens, 2020) as well as what other studies have found in India (Yenneti and Day, 2015, 2016; Yenneti et al., 2016).

Furthermore, results here resonate on how science and technology is used by governments as predictive methods (risk assessments, cost-benefit analysis) to retain management and control (Jasanoff, 2005). However, this poses important key issues found in Yucatán. First, technical proficiency conveys the false impression that analysis is rigorous and complete, leaving as an afterthought what falls outside its field of vision. For instance, the narrative from government and industry relies on the idea that renewable technology and other infrastructure development themselves are good a priori and sufficient to solve climate change impacts. As noted in Chapter 5 and complemented in this chapter, there is little to no room for integrating local knowledge. Second, these technologies tend to pre-empt political discussion (Jasanoff, 2005). In Yucatán, RET arrived with economic and technical feasibility where experts create high entry barriers against legitimate positions that cannot express themselves in terms of the dominant discourse. To overcome this, infrastructure development should seek not only what science and engineering can do, but also it should integrate the ethical and political consequences in the analysis of all kinds of technologies (Jasanoff and Kim, 2013).

In addition, the findings in this research highlight that cumulative impacts are missing from the EIAs and it is needed to be included. Local scholars and community members expressed their concerns about the lack of cumulative impact assessments. For example, an environmental engineer strongly stated

that wind farms cannot be installed without an appropriate study of the migratory birds: “Yucatan is the corridor of migratory birds, the risk of altering this migration will have impacts to the ecosystems”. Other community interviewees emphasized that wind turbines are located too close to the only highway connecting Progreso to Yucatan: “If a hurricane hit Yucatan, those wind turbines might block the only entry point to the capital where the shelters are located in case of droughts”.

Finally, to advance further, this section has shown that infrastructure development (for example, parks, cultural centres) are viewed as another imposition and not what community members want and need for their own developmental choice. Additionally, this section highlighted concerns among residents of the region regarding the cumulative impacts of wind and solar infrastructure. The following section explores distributional injustices focusing on job creations.

6.3 Employment

Renewable energy if completed in full would potentially create 235,280 jobs in producer countries (Werenfels and Westphal, 2010). In 2017 renewable energy industry created 10.3 million jobs worldwide (IRENA, 2019). However, at least locally, interviewees from communities and local NGOs, respectively, stated that there are not enough jobs for all community members:

> “When I asked about the jobs they will offer, developers told us they will be construction and cleaning activities and it will last until the construction ends which in some cases could be 3 months or 6 months” (Local interviewee).

> “Well-paid jobs are characterised by high technical skills. The communities lack that type of specialization. Middle age and elderly members’ average education are primary school. So, you can totally tell when they refer to job creation, they are talking about jobs for people living outside of rural communities. Developers do not offer training so at the end the available jobs for communities are temporary and poorly paid” (Local NGO interviewee).

Some developers and government authorities argued that the projects provide a large number of job opportunities for host communities and its neighbouring towns. A developer mentioned that “these projects will generate many jobs and that cannot be any bad for communities”. Similarly, national authorities argued that in a cost-benefit analysis, host communities would have many advantages as one stated “they do nothing with that land and now they have the opportunity to receive a payment for it without the need to work”. Conversely, a community member mentioned that “governments are neglecting agricultural aid for small producers, thus when developers arrive in our town and see large territories, they see a money opportunity and they argue that without their business idea we would not have incomes”.

Interestingly, I interviewed a SENER representative in México City, when I asked his opinion about the temporary jobs, he emphasized that “It is true there are not high skilled workforce in Yucatán, but we are investing in people like you, to become experts in the future, like all public policy, there is a learning curve. In the future, you might be advising solar and wind companies' '. He, then argued that renewable energy is a priority for national government:

> “México will generate more and more clean energy like all nations do, México needs a solid energy system, and eventually the sector will create more and more jobs”. *(Government official interviewee).*

When I asked about potential local impacts of national energy policies, he pointed out that he was not responsible for the current energy legislation and he admitted not being aware about the employment rates of Yucatán. He emphasised he is not an expert on environmental impacts of solar and wind developments, but assured me they are being carried out according to the laws.

Furthermore, once RET projects are accepted, developers prepare the EIAs where in most cases includes a social section establishing the economic and social impact of the project. Nevertheless, EIAs lack a deep analysis and therefore offer little information about what kind of jobs the project would create, how many and what kind of work conditions is provided:

> “When I asked about the jobs they will offer, developers promised many jobs, they told us the town will grow economically. However, they forgot to tell us that the jobs are temporary and also forgot to tell us about job remuneration. I think there are no benefits with this project” (Local interviewee).

When interviewing a representative of an international NGO, he pointed out that they are applying concepts of energy justice in México with a focus on how workers from fossil fuel industries would be relocated given the energy transition towards a low-carbon future. However, when asked about social impacts of livelihoods regarding RETs developments, the interviewee expressed that the organisation has not any project related to local impacts:

> “We are working on a project with an energy justice approach. This is aimed at rethinking how governments would reallocate workers from PEMEX to other industries. The transition towards a low-carbon economy is imminent, organisations and governments need to focus on what kind of jobs that transition would need and how to distribute them in a just way” (International NGO interviewee).

A scholar with expertise in sociology observed that negotiations about leasing land are not transparent and that there is a lack of evidence of quality of jobs within the community related to energy projects. Certainly, when I reviewed the EIAs and SIAs it was not clear the quantity of jobs per community, and when interviewing some community members hired to deforest the land, most of them argued that the jobs are not permanent and the salary is not sufficient:

> “I am sadly helping them to destroy our *monte*, the house of our animals but I have no other choice but to work with these people” (Local interviewee).

Some interviewees expressed concerns regarding the way SENER serves as mediator when negotiating the price of the land between developers and landowners. A SENER official stated that “I always try to get the best price for the community even though it is a hard job”. When I asked community members about this, the vast majority felt deceived regarding meetings with developers

and SENER where contract clauses were negotiated. It is worth mentioning that not all host communities in Yucatán reported this type of negotiations. I asked about this to local scholars and civil society members, they attributed it to the lack of transparency and accountability. One stated “government authorities do not involve all community members affected by the project, they negotiate with just a few they can convince to accept such unbalanced contracts”. This is consistent with what I reported in the procedural justice chapter where SENER officials intentionally prefer to conduct meetings with selected people without scrutiny of all affected by solar and wind projects.

Interviewees from academia agreed that as a “representative from SENER it could not be impartial because they have the agenda of increasing renewable energy developments”. Furthermore, from the perspective of such interviewees, permits have been granted via a questionable, coercive and duplicitous process and opaque mechanisms:

> “It is clear that some people who are close friends of the communal president and the president itself received extra-legal remuneration for their collaboration. Developers approached them first, gave them money, food and alcohol and temporary jobs to convince the rest to accept the project and if not, we received threats and some of us like to live in peace and that is why we remained quiet.”

While host communities might lose land and benefit only from temporary low paid jobs, non-local workers might emerge as beneficiaries with no personal costs and burdens. National authorities might also benefit from this type of developments because they are consistent with international commitments to transit to a low-carbon future and national policies to increase 35% of renewable energy into the energy mix. The debates pose unanswered questions about the long-term livelihoods of host community members, now without land resources and with the climate crisis, living in already marginalised communities. The next section tackles issues of land dispossession related to climate energy policies.

6.4 Land Dispossession in the name of Climate Change

Results of this study supports concerns about climate change policies in Yucatán might lead to issues of land dispossession. Particularly when such RET developments are to be installed in communal lands. Green policies, particularly energy policies, seem as solutions to climate issues with a spill of social benefits rather than rethinking the relations between economy, society and nature. This suggests that by simply shifting technologies promoting economic activities with lower pollutant externalities might solve environmental, economic and societal problems. In this section, I aim to illustrate how green technologies such as wind turbines and solar cells can have consequences that can offset intended benefits.

Large scale RETs developments in Yucatán would require thousands of hectares of land (See Photo 6.2).

Photo 6.2. Solar project "San Ignacio" (source photo by Cuauhtémoc Moreno)

Throughout my fieldwork, developers, government and some international NGOs argued that México must promote policies to tackle climate change impacts. Indeed, one of the recurrent themes from data collection was climate change. When attending to meetings organised by developers, the principal narrative justifying solar and wind projects was the recurrent theme of avoiding climate impacts:

> "Climate change impacts are real and are going to hit hard. We need to do all in our power to ameliorate such impacts. We now know that energy is the sector that pollutes the most and we need to shift the energy system" (Developer representative).

Interestingly, authorities and developers emphasised how important solar and wind projects for climate change impacts. Whilst community members, academics and some local NGOs felt that governments are using climate change as a means to fast-approval such projects. On the one hand, stakeholders from government and developers felt that renewable energy projects are essential to ameliorate climate change impacts. On the other hand, local scholars observed that there is a lack of policies aiming at reducing energy consumption:

> "There is this false discourse that solar and wind energy generation should by itself solve the climate crisis. It is a fact that we need energy but governments are overlooking policies to reduce energy consumption" (Environmental engineering scholar).

According to the vast majority of interviewees from host communities, the most important aspect regarding solar and wind projects is the possibility of losing their lands. During the many interviews with community members, some members referred to the implementation of the energy policy as another way of neo-colonialism and even mentioned several times the term 'green capitalism'. A community member from San José Tipceh expressed that "they want our land to solve climate change, the business logic is to deforest our land to put solar panels".

A woman from a different community echoed these concerns about dispossession in the name of climate change:

> *"*They want to steal my land to transform it into a desert piece of soil. Government says there will be economic growth, they also said that it will alleviate poverty but I honestly cannot see how. Bringing machines to generate energy we cannot use because they will sell it to big companies does not sound like I would get money from it. They just want our land to make millions for themselves and their business friends. They do not realise that what they see as a piece of land for us is our nature, our way of living, and we know how to best take care of it."

Similar findings were echoed by local scholars and civil society interviewees regarding the climate change discourse used by developers and governments in order to get solar and wind large scale approval. Internationally, the World Bank suggests that to tackle energy poverty means lending support to large-scale infrastructural projects rather than small-scale renewable production (Martinot, 2001). Notably, 90 companies are responsible for two thirds of the world's CO2 emissions (Heede, 2014). Achieving pollutant reductions might increase the company's value in the market and therefore increase their profits. However, little is advertised about the burdens of host communities and the compensation deals. If social cost is accounted for and informed perhaps the revenues of advertising green companies might not be as high as it normally is.

In addition, wind and solar developments will require the use of rare metals and minerals. For example, solar power plant projects in Mexico are estimated to require 228 thousand tons of minerals, mainly aluminium, whilst wind power projects will require 1,336 miles of tons of minerals, mainly iron (Geocomunes, 2020). This might represent pressing challenges such as the need of natural resources and supply chain due to the large amounts of rare materials required for the low-carbon energy technologies and infrastructure. For example, rare material extractions occur in areas where such activities remain environmentally mismanagement and they might be a source of conflict at those sites of resource extractions (Sovacool et al., 2020; Mulvaney, 2013)

Furthermore, wind farms will require the use of 1,200 tons of cement for the foundation of each wind turbine (Geocomunes, 2020). It is estimated that the mining of minerals and production of cement account for a third of industrial GHG emissions (Azadi et al., 2020). Given the considerable requirements of minerals and cement, and the aforementioned issues associated with these materials, together with plans to expand the sorts of developments that rely on such materials, it is clear that environmental policies are needed to mitigate such impacts - an aspect currently omitted in current policy (Geocomunes, 2020; Mulvaney, 2020).

According to some community members, they found out about the project in a meeting organised by the *ejido* president and the developers. It is in such meetings that developers told them a big project is going to be built and it will bring local economic growth without getting into more details. Some interviewees from communities indicated that the procedures of actual enclosure were extra-legal; they accused local authorities of colluding with developers. The aim, according to interviewees of the collusion was to deliberately trick illiterate and vulnerable members of communities into signing what they were told was an attendance list, but in reality, was an agreement to allow developers to use their communal land:

> “At the end of the meeting, developers opened a bag full of money and told us that this money is only for attendance. In order to receive the money, attendees had to sign what looked like an attendance list. Developers told us this was just the beginning of a series of incoming payments. During the meeting, everything was just about the many benefits of the project. That made me feel suspicious and I looked up information on the internet. After researching and meeting with a lawyer friend, we requested information about the project and it turned out that what we signed in that meeting was an agreement to cede our communal land to the developers to begin the project. We are losing our land because they want to solve climate change.”

Additionally, some interviewees from host communities were concerned about the consequences of not being able to use their land. Some of them observed that their family members had to commute to the capital for jobs:

> “My dad had to partially move to Mérida because there is a lack of agricultural support. A few years ago, agricultural programs provided us with backyard animals as well as livestock. Now we have only one cow. I am worried that with the leasing of the communal land, that cow will not have a place to pasture” (Local interviewee).

According to interviewees from local and national NGOs, local and international scholars México adopted environmental policies that favours entities possessing financial liquidity to build and operate large-scale renewable energy projects (Baker, 2016). Interviewees from national government agencies asserted, “renewable energy is expensive, México by itself cannot invest in it and it does not have the technology”. Using large-size projects, developers are able, at least in theory, to reduce fixed costs such as legal and permitting fees relative to variable cost, and thus reduce the overall cost of the project measured in terms of cost per unit of output and maximize returns:

> “National auctions are how other nations boosted renewable energy generation; it definitely has downsides but it is how it is done worldwide. México is following such a trend, otherwise such technology would not be affordable. I believe increasing renewable energy generation is an excellent policy” (International NGO interviewee).

National auctions used as a market-driven promote competitiveness amongst developers where the price of the electricity is one key important aspect to be selected as a winner. Hence, México is trying to reduce the costs through national auctions to incentivise foreign capital to invest in these technologies. However, such energy policy is carried out at the expenses of the livelihoods of many host communities in Yucatán. In addition, the market-driven mechanisms offer little incentives to engage properly with host communities.

As argued by Harvey (2018, p. 74) injustices often manifested under capitalist modus operandi concept of accumulation by dispossession which is characterised by coercive processes of asset accumulation in the hands of the

powerful at the expense of the less favoured. Recently, Baka (2017) coined the term “Energy dispossessions” which refers to the ways in which networks of power such as the state and private sector actors are responsible for the appropriation of livelihood resources (Baka, 2017). Such discourses of appropriation were evident in the local interviews:

> “I am always amazed at how policymakers cannot see that their businesses rely heavily on our nature. It should be in their best interests to carry out accurate environmental assessments. This is not new; we have had this social engineer since colonisation. The process of accumulation of capital and the process of separation of local producers and their livelihoods, implies that the common land is expropriated and transformed into merchandise” (Local farmer interviewee).

Conversely, the responses from national and state government officials agree that leasing the land will bring economic benefits to landowners because rent money will help them to improve their wellbeing. Some of them mentioned that without these types of developments, the land would remain unused and the population will not have that income:

> “The government cannot use economic growth as an excuse to violate indigenous rights. By doing so, they are acting condescendingly by thinking they know the best projects for the community without even visiting it once and really asking them what they need to improve their economic status” (Local scholar interviewee).

According to Moore (2016), this way of making policies relies on how historically capitalism is built because from the perspective of imperial administrators, merchants, planters, and conquistadores, humans that happen to be indigenous peoples were not human at all. They were regarded as part of nature, along with trees and soils and rivers and treated accordingly. Under this capitalist rationality, the [unpaid] work and resources of disadvantaged groups is mobilised in service to transforming natural landscapes with the purpose of endless accumulation of capital. Again, this perspective resonated throughout the local interviews:

> “There was not a problem if the State would look after us. However, you can clearly see that land grabbing practices are facilitated by members of the government and business men. They have this idea that they can treat us like a purchasable object. We are protecting our land, our rights and our nature because that is how we live. Our land as well as our dignity is not for sale” (Local interviewee).

This discourse is similar to cases in Latin America. For example, a former president of Peru referred to nature as “empty land” (Shiva, 2006). In this sense, Navarro (2012) highlights that this type of narratives not only denies the rights of native peoples but also strips the nature of its right of self-preservation, regeneration and sustainability. Farmers highlighted how government officials characterised their land as unproductive:

> “Government officials use a particular narrative to strengthen the idea that our lands had not previously been sufficiently productive. The authorities also stated that our land is an impacted area, so it would not matter if they installed wind and solar parks. As you can see, they are all excuses to justify losing our land” (Farmer interviewee).

These results not only indicate that local communities are not part of the planning processes but also that their opinion is overlooked by what policy makers believe is an economic solution for communities. In this sense, the right of self-determination is violated but also there is evidence of how government authorities implement policies aiming economic growth at the expense of international indigenous laws. This could be explained by the fact that rural communities are often the economically disadvantaged population in the country. At the time of writing, some of the projects are facing lawsuits mostly due to the land grabbing extra-legal mechanisms used to obtain permits to lease communal land.

6.5 Provision of clean energy

One of the concerning findings from this study is that host communities would not benefit from solar and wind projects. The energy access in México covers 98% of the population. However, a frequently raised point regarding potential benefits of solar and wind energy projects in Yucatán is the local access to low-cost or free clean energy. Energy bills in Yucatán are considered higher than other regions of the country (Geocomunes, 2021). This is explained by the costly transmissions' lines making it possible to transfer converted energy into residential areas.

During the interviewees with government officials, the majority expressed that the energy bills will decrease. When asked developers if the communities will be provided with solar and/or wind energy, they pointed out that their responsibility is to generate the energy and then sell it to the CFE. During an interview with a developer, he claimed with a short laugh "of course that energy is not for the communities, we will sell the energy and sell the clean energy certificates". This is not something new, Baker (2016) described how big companies like Walmart and Heineken are benefiting from this type of energy business. In this sense, it is clear that distributional injustices are occurring in the deployment of RETs.

Clough and Bell (2016) explains that the distribution of costs and benefits of energy infrastructure range from suffering hazards associated with proximity infrastructure sites but are not enjoying substantial economic benefits from the development. The results of this research are aligned to the above literature as reflected by a community member in the below quote:

> "I asked if that electricity will be used in our community or if we are getting discounts in our electricity bill but the developer said that it is likely we are not getting any discount as developers will sell the energy to the CFE and they will decide what to do with it. The wind turbines will be in our territory but we are not going to be able to use more electricity at a better price to power our homes. Why do I accept that?". (Farmer interviewee).

When interviewing, some community members who were in favour of solar and wind projects. They see this as an opportunity to reduce their energy bill. One of

them stated that “it would be a huge relief to see energy discounts in our bills, I do not see a downside of that”. Another one noted that reducing energy bills could be a way to reduce poverty and “have some pesitos for savings or even entertainment”. Nevertheless, the vast majority of community members, scholars and civil society are sure that those energy bill reduction promises will never materialize. A natural scientist scholar angrily stated:

> “They encompass these proposals with misleading expressions, such as nature-based solutions, neutral carbon, zero net emissions or the even more absurd negative emissions. Absurd because there is no gas that once emitted is less than zero. All are language traps, since they do not reduce greenhouse gas emissions, but claim to offset those emissions to justify continuing to pollute. They are not reductions, but accounting juggling so that the sum ends in zero or even negative, in which humanity will be owing the favour to the companies that caused the disaster.”

An agricultural engineer echoed and expand this by stating:

> “All the companies that now talk about "climate solutions based on nature" intend to open new fronts of dispute over the control of agricultural fields and territories, which they hope will help them obtain new tradable credits in the carbon markets, despite the fact that demonstrated that these markets have not worked to combat climate change.”

Moreover, other scholars mentioned that increasing energy generation in Yucatán has nothing to do about providing clean and affordable energy to citizens, they assure that is to sell such energy to big industries in Quintana Roo, the neighbour state, where mass tourism require large quantities of energy to supply big resorts of Cancun and Riviera Maya. As a result, the state of Yucatán is a power surplus state (See Figure 5), the government benefits by selling the electricity produced at much higher prices to industrial units in the state and to the power-deficient neighbouring states. In this sense, energy benefits accrue at the national level and in other states, and monetary benefits to the state

government and business developers, whilst there is little to nothing return to the local more impoverished communities.

6.6 National policies, local impacts

Stakeholders from the communities and local scholars were concerned about how national policies resulting from the Energy Reform might have an impact on local communities. For example, interviewees from the communities claimed that policies have been made at the national level without taking into account the possible impacts on localities. Such stakeholders were impressed about how fast projects arrived to their communities. The vast majority felt that projects were approved fast because *la orden vino de arriba,* referring to the order came from the highest hierarchy, which in the case of México is understood as the national legislation:

> “It took us by surprise that a lot of projects were arriving at the Peninsula. It was silently disturbing. You know you have no voice because the decision came from the national government. However, they have no clue about our region, our type of soil, or our water supply mechanisms. They politically use energy policies without analysing it first, those legislators have never been in this town, how would they know if that policy fits in here?” (Local farmer interviewee).

During interviews and meetings, I observed that authorities of different agencies when questioned about their responsibility in the implementation of renewable projects, and they often said that they cannot do anything about it, that a particular task is the responsibility of someone else. For example, the following quote illustrates the general responses when asked to the state environmental agency:

> “We do not have enough budget to hire specialised staff to evaluate environmental impacts of such projects. That is the responsibility of SEMARNAT, you should talk to them.”

National authorities recognised in interviews with me that Mexican policy makers made a great achievement of passing the Energy Reform. They agreed that México must follow international trends to tackle climate change. For instance, an interviewee stated that the Energy Reform and the ETL were not only made to solve structural issues in the sector but they are very crucial to achieve environmental targets. Conversely, stakeholders from academia, community members and some NGOs had a sense that RE projects in the Peninsula might be doing more harm than good. Some of the community members felt dissatisfied with the mechanisms adopted by México.

> "The developer told us that they will cut our trees to put panels in order to save the planet from climate change. How ironic is it? They want to save the planet by killing trees. I might not have a school degree but even I know that sounds absurd. Those SENER officials coming from México City had no idea of what they approved. And do not get me started with the State authorities, they know our region and they let them do whatever they want. Our municipal president is fooled by the developers and government officials" (Local interviewee).

Another community member echoed this view by saying that a diverse and stable forest, full of biological and ecological interactions is not the same as a solar energy project. Academics and local NGOs emphasised that attributing the responsibility of climate change impacts to indigenous communities was a bold move even for the government. This was illustrated by one of the local academics:

> "In some of the meetings, developers explained how climate change is causing natural disasters and how we should shift to low carbon alternatives as if community members were responsible for a great amount of CO2 emissions. We clearly know it is not the case."

The overall feeling amongst scholars, NGOs and community members was anger when they pointed out that biodiversity might be endangered by infrastructure that is supposed to ease climate change impacts. Further, they agreed that national policies have impacts on local livelihoods. There was a

general sentiment of discontent regarding national energy policies amongst community members, local scholars, NGOs and civil society:

> “The renewable energy project in Tizimin is really close to the protected area Rio Largartos and in fact it is violating the ecological state protocols. As a national policy of one of the most important sectors in the country, the policy has a vertical approach. Such policy is overlooking environmental laws, and indigenous rights laws" (Local scholar interviewee).

Issues related to the implementation of renewable projects were particularly prominent in the interview data. Local scholars and activists drew upon this issue by mentioning that in Mérida, the state capital consumes the vast majority of energy and people from the city clearly emit large amounts of CO2 than people from rural communities. However, the government adopted large scale projects located in rural areas because it is profitable. Interviewees made the connection between mechanisms approved by policy makers and the implications for host rural communities:

> “The new electric market created in the Energy Reform is nothing but absurd. Companies might buy clean energy certificates in order to keep polluting thousands of livelihood communities. This national policy contravenes so many laws and they are still being approved by SEMARNAT” (Local NGO interviewee).

Another theme that the government authorities brought up was the urgent need to achieve energy security. National authorities especially claimed that México should pursue energy security in order to stop relying on coal to generate electricity:

> “The trend is clear: we need to shift from coal to renewable energy. This would make us more resilient and less petroleum dependent” (SENER interviewee).

Similarly, other interviewees claimed that renewable projects would help to achieve energy sovereignty asserted that “we cannot risk the possibility of

shortage in energy supply, especially because we have the USA as our neighbour and its leader is not quite fond of us". These findings echoed how energy sovereignty has been focused on safeguarding markets and supply without considering social costs (Ibarzábal and Bonilla, 2020; Sovacool et al., 2019; Alvial-Palavicino and Ureta, 2017).

However, since the approval of the energy reform to the time of writing, fossil fuel for energy generation has not decreased, in fact, despite the increase in installed capacity of renewable energy, electric power generation increased emissions from 133 to 162 Gg of CO2 between 2005 and 2017, hence as long as the increasing in fossil fuels for electric power generation continues, the growth of renewable energies will not have a significant impact on reducing CO2 emissions (Geocomunes, 2021). Therefore, the country is keen to generate more and more energy by widening energy sources but not decreasing the use of fossil fuel.

The majority of community members interviewed felt reluctant about the business model of renewable projects. For instance, one stated, "The vulnerability of communities, myself included, was not considered when they made the Energy Reform". Another claimed: "Nature is wise, you see nature has limits for resources of production and waste whereas the political economic system is based on limitless consumption and waste. That is how we got where we are now". In addition, a community member noted that "they call it clean energy but it has nothing clean in the way they violate human rights and environmental state protocols".

There is an increasing concern among stakeholders about how those projects are approved. On the one hand, community members stated that energy policies are still relying on technical and financial criteria overlooking social aspects such as possible affected livelihoods. On the other hand, academics added that the way the government is planning for the transition to a low-carbon future might risk the environment. A community member explained to me that "projects have been approved by an algorithm. The projects who meet the financial and technological criteria are approved without the consent of indigenous communities". Such views are aligned with the critiques on how energy transitions are frequently approached and understood in the mainstream policy

literature as primarily technologically and market driven (Murphy and Lawhon, 2011).

The vast majority of interviewees felt that the efforts to include social criteria are not enough, especially when there is a risk to compromise the livelihood of many indigenous communities.

> “The principal banks such as the World Bank and the BID tried to promote more social aspects into the requirements for financing renewable energy projects, but they are not sufficient when the decision is mainly based on economic indicators” (International NGO interviewee).

Similarly, an interviewee from a local civil society organisation claimed that If the project has enough investors, it is very likely that it would be approved regardless of the social aspects of each affected town. Furthermore, some scholars mentioned how ironic it is that the projects are approved under technical and economic criteria whilst the environmental and social assessments are approved with very little scientific rigor. For instance, they highlight the fact that Yucatán has a high risk of hurricanes and the MIAs do not include information about mitigating strategies for wind turbines and solar installations in case of such disasters.

Another interviewee asserted that “some of the EIAs do not specify how much the turbines weigh, isn't it funny?”. In the same vein, interviewees reported that “because projects are nationally approved based on technical and economic criteria it does not matter if such developments would be located close to state natural protected areas”. Another scholar added that time constrained might endangered the veracity of social and environmental evaluations:

> “The timetable is very limited and that is why developers conduct MIAs from their desks without spending enough time in the communities analysing the biodiversity. Some of the environmental consultancies hired to conduct these are not even located in Yucatán. They are mostly located in México City and they lack knowledge of the region and their environmental laws”.

On one occasion, whilst interviewing a local scholar showed me a map from an EIA and a photo (See Photo 6.3). The map showed the extension of a project located very close to a state natural protected area home to a diversity of birds, the disappointed scholar after a sigh expressed:

"Look at it, I cannot believe they authorised that project. They have no shame"

Photo 6.3. *Wind project in Dzilam de Bravo, Yucatán by Jesus Bobadilla*

The authorities are limited in their capacity to examine the assessments submitted by companies and to ensure proper oversight of their activities. In fact, officials from national, state and local levels argued they are constrained by both financial and time limitations to conduct the consultation processes. This might cause indigenous rights violations because facilitating accurate information, adequate mechanisms of participation, and inclusion of indigenous customs and ways of living, require time and financial resources. In addition, the secrecy of such projects does not encourage transparent processes.

> "I am the only one who runs these meetings and I hope that in all of them everything runs smoothly as possible and that is why I always tell

> developers not to make a fuss in the media, otherwise outsiders will come to disrupt the consultation processes". (SENER interviewee).

This section raises concerns about how national energy policies might be overlooking social aspects into the energy transition. As it can be seen in previous sections, the relationship between society and government is fragmented and avoiding people's inputs into the decision-making might have a high cost to México. In this sense, as noted in chapter 2, the approval of renewable energy projects based on innovation in technology as a mechanism of systemic change (Shove and Pantzar, 2005) might neglect the potential inputs of a range of different actors involved in the energy transition (Chilvers and Longhurst, 2016). These results suggest a disconnection between policies made at a national level and the impacts on communities who would host developments resulting from such policy decisions. Thus, the results indicate that the Energy Reform and ETL with a top-down approach might be undermining state and local authorities' capacity to participate in decision-making of their development. The developers arrived in Yucatán when they already had projects approved causing some conflicts between levels of governance and community members.

6.7 Concluding Remarks

As an emerging market country, Mexican political and economic actions are subject to the attention of international policy. Following the international development agenda, México has adopted climate policies immersed in a neoliberal pathway of national policy regarding electricity generation capacity, creating a lucrative market for capital owners (Baker, 2018). The distributional justice aid pointed out who are benefited and who are bearing the costs of installing large scale solar and wind developments. Whilst private companies profit from these projects, most of the local communities perceive that they have no benefits at all. Instead, there is a great concern about land dispossession.

This Chapter has discussed the distribution of the benefits and burdens arising from the development of solar and wind projects in Yucatan. Drawing on the accounts of all stakeholders, the results suggest there is a strong case for claims of distribution injustices. The solar and wind projects are spatially distributed in rural areas mostly inhabited by indigenous peoples. The risk of losing land resources from a social minority is justified on the basis of achieving a greater good in terms of national economic development and international climate change targets. The deployment of solar and wind projects is seen - by developers and governments - as an environmental good, however, results suggest that such projects can create social inequalities. Proper policies should be adopted to ensure that the burden-bearers are not always the poor and marginalised indigenous communities.

The results here are similar to those in Oaxaca, México, characterised by conflicts and dubious practices (Howe and Boyer, 2014; Howe et al., 2015; Friede and Lehmann, 2016; Mejía Carrasco, 2017; Siamanta and Dunlap, 2019). These practices include land grabbing and control of common use, asymmetrical negotiations between developers and communities, dubious contracts for land rents, harassment, and verbal and even physical attacks against people who question or oppose projects (Dunlap, 2016, 2017b, 2017a, 2018; Velasco-Herrejon and Bauwens, 2020). In addition, the evidence here suggests that projects aiming at reducing the impacts of climate change might lead to the dispossession of land belonging to indigenous communities.

The siting of solar and wind power plants is key to avoid concentrating the burdens in certain areas. Therefore, a country's energy policies should promote the distribution of solar and wind developments in a way that not only takes into account their economic and technical viability in different areas (Villavicencio Calzadilla and Mauger, 2017) but also such policies should take into account the less heard voices, those voices that will be bearing the costs of hosting large-scale infrastructure projects. As discussed in Chapter 3, I reviewed some EIAs and SIAs reports; such reports are lacking local knowledge and expertise of those who better know their territory. These reports rely on risk assessments and cost-benefit analysis without conducting in-field assessments with host

communities. Such analysis definitely should be included in the EIAs and SIAs in order to prevent distributional injustices.

The evidence suggests that the policies adopted to attain climate change targets might be neglecting indigenous rights by forcing indigenous communities to rent out or sell their land to businesses. There is a rising risk of land dispossession, conflicts and forced displacement as a result of the growing interest in natural resources in indigenous territories (Dunlap, 2017b, 2018a). This way of conducting business has raised social conflicts concerns as energy infrastructures aggressively acquire natural resources commonly in undeveloped rural areas (Del Rio and Burguillo, 2009; Zografos and Martínez-Alier, 2009; Yenneti et al., 2016; Ablo and Asamoah, 2018; Zárate-Toledo, Patiño and Fraga, 2019; Velasco-Herrejon and Bauwens, 2020). Governance arrangements regarding renewable energy in México need to be strengthened, particularly in relation to securing the involvement of all affected communities with representation of socio-culturally marginalised groups.

This chapter depicted how environmental targets, politics and development are intertwined in the energy transition in México. There is no doubt that the international arena plays an important role in national decisions regarding climate change. However, results here suggested that the energy transition has little to do with environmental concerns. Overall, results here suggested that there is a potential risk to endanger biodiversity and ecosystems in Yucatán due to lack of scientific rigor within the environmental assessments of these developments. The evidence points out that the climate change narrative, political interest and the market mechanisms are unlikely to be the pathway to achieve a just energy transition.

Results here suggest that the Energy Reform and the Energy Transition Law frameworks have a vertically top-down organisation. The Energy Reform has a vertical structure where there is not even room for local government authorities. Interestingly, when investigating the jurisdiction related to renewable energy projects, the Electricity Industry Law in its Article 7 states that all electricity activities are federal jurisdiction. This means that this law does not grant any competence to state or municipal authorities.

The findings illustrate the need to rethink relations between society, environment and economy. In spite of the liberalisation of the energy sector, México retaining energy sector assets might direct energy futures to a semi-centralized system replicating many of the social and political inequities characteristic of the prevailing fossil fuel regime (Mitchell, 2009). Thus, México should incorporate other forms of energy production such as off grid, energy communities where the assets can be redistributed (Capaccioli *et al.*, 2017; Lacey-Barnacle and Bird, 2018).

Chapter 7: Recognising Injustices

They talk to me about progress, about 'achievements', diseases cured, improved standards of living. I am talking about societies drained of their essences, cultures trampled underfoot, institutions undermined, lands confiscated, religions smashed, magnificent artistic creations destroyed, extraordinary possibilities wiped out.

- Aimé Césaire

7.1 Introduction

The energy justice literature particularly with recognition of justice have been focused on elderly population, disabled people, and increasing energy bills in Europe and in the United States (Walker and Day, 2012; Middlemiss and Gillard, 2015; Snell et al., 2015; Liddell *et al.*, 2016; Reames, 2016; Gillard et al., 2017). This chapter highlights the recognition [in]justices occurred in Yucatán within the deployment of wind and solar energy projects in indigenous territories. Section 7.2 highlights indigenous rights violations regarding their right of self-determination and how language barriers impact. Section 7.3 analyses the role of indigenous women within the deployment of wind and solar projects in Yucatán. Section 7.4 explores the struggle of indigenous communities facing rapid approval of large-scale energy projects. Section 7.5 important human and indigenous rights violations. Section 7.6 explores alternatives of development. To conclude, Section 7.7 provides a summary of this chapter.

7.2 Contesting land: *La Tierra es de quien la Trabaja*[9]

[9] The land belongs to those who work it

A strand of literature scholarship has been focused on questioning how environmental change is embedded in issues of class, race, gender, sexuality, nationality (Reames, 2016; Monyei *et al.*, 2018). Thus, looking at how society understands their relationship with the whole of nature, and how that nature has been radically remade over the past five centuries is important to trace the path towards a just and sustainable energy transition for all. It is perhaps the idea of "for all" that this chapter aims to address. In this section, the results will focus on the dynamics between indigenous communities and key actors and how energy transition is taking place in rural areas in Yucatán, México.

I named this section *"La Tierra es de quien la trabaja" with* a purpose. It was a phrase I was very familiar with prior fieldwork but it was also a phrase I heard during fieldwork. I first heard that phrase in primary school when the teacher was telling us all about the Mexican Revolution. My teacher mentioned "La tierra es de quien la trabaja" is a famous phrase of Emiliano Zapata Salazar, a well-known peasant leader, who fought for the enactment of the agrarian reform, proposed in 1911, during the Mexican Revolution. In the history of México, Zapata represented the peasant resistance, fought for social inclusion, agrarian reforms, defence of communal land ownership for peasants and indigenous communities and the redistribution of lands (Zamora Lomelí, 2015). Many years after that school lesson, I heard indigenous communities yelling out loud *"Recuerden que la tierra es de quien la trabaja, recuerden nuestra lucha, recuerden nuestros derechos"*[10] *in* meetings I attended during fieldwork.

In order to contextualise, since 1915 the ejido is a society of social interest; made up of Mexican peasants by birth, with an initial social patrimony made up of the lands, forests and waters that the State gives them free of charge in inalienable, non-transferable, attachable property subject to their use based on cooperation and economic democracy (Navarrete, 2017). In spite of this, many scholars have argued that over the years this type of land ownership has not served its purpose (Zúñiga Alegría and Castillo López, 2010; Torres-Mazuera, 2015), this type of analysis, however, is beyond the scope of this doctoral thesis. As mentioned in previous chapters, México is distinctive in that half of the national territory is

[10] Translation: Remember that the land belongs to those who work it, remember our fight, remember our rights

owned collectively by peasants and indigenous peoples in the form of *ejidos* and agrarian communities.

During many interviews with community members, I noticed how they kept repeating “they want to steal our land”. As discussed in Chapter 6, I observed an increasing concern regarding the dispossession of their land. Indeed, México has a long history of contested land. Despite the fact that the type of land ownership “*ejido*” was created as an instrument to redistribute the land, the outcomes of such ownership remain as one of the most contested issues in México (Vergara-Camus, 2012).

Some authors reported that in Oaxaca some *presidentes ejidales*[11] have colluded with developers in order to fast track the approval of renewable energy projects (Dunlap, 2017a; Brock and Dunlap, 2018). As noted in Chapter 6, in Yucatán there are similar results regarding interviewees reporting extra-legal activities from the developers and governments to indigenous peoples. In spite of this, most of interviewees from communities recognized that the structure of communal land, land owners have more possibilities to protect their territory, at least with the aid of legal mechanisms:

> “We have the ejido and it can be problematic but, in a way, it acts as a mechanism to protect our land. You see communal land is what we have on our side to defend us from green capitalism. It is true that the signature of the ejido president is sometimes the only requirement to lease the land. However, if the ejido president signs anything without the collective agreement, we can use this legally to override leasing contracts. We know that some ejidos have done it and we are looking for legal aid to do the same. You see, that legal process is expensive and sometimes becomes a long and tedious process. We normally do not understand legal terms but with the help of social organisations we believe we can claim our rights” (Local agriculture interviewee).

These efforts to defend communal land might represent important challenges for indigenous communities. The misrecognition of their territories and indigenous

[11] Ejido presidents

rights might lead to injustices when implementing RET developments. Furthermore, the vast majority of community members felt upset regarding the arrival of solar and wind projects to their towns. Overall, it was argued how these projects bring conflict within their communities:

> "These big projects divide our community, sooner or later we found out when the business man offers money to the ejido president, and some of them accepted it but some of us rejected because we want to protect our land, this is when we organise ourselves, we are just a few that will not be bought by the rich" (Local woman interviewee).

Interestingly, community interviewees observed that both developers and government officials argued that with renewable energy projects at least landowners will receive some sort of income which is automatically something good because it is beneficial, as their land is not producing economic profits through agriculture or livestock farming. This also accords with government officials' views, if the land is not producing profits by itself then any project that would be beneficial for those who own a piece of land. A community member stated:

> *"*The SENER official arrogantly expressed that our land is not producing food, therefore, hosting the infrastructure in our land would bring economic benefits to all. However, it was the government who decided to cut down agriculture subsidies and all the support for rural zones. For our family, there is no separation from us and the land. They like to impose how we should work our land. The truth is that they do not care about our opinion, they think because we are poor and indigenous can do whatever they want with our land. That land is all we have and we will defend it" (Local elderly interviewee).

This posed two further important issues for community members; firstly, the government neglected rural zones by cancelling agricultural subsidies for peasants. The second one raised concern to community members who claimed that their land is part of their lives. There is substantial evidence that most agricultural labourers' dependence on common land results as major victimised groups as they have lost their traditional livelihoods and the ability to pursue their

customary lifestyle (Yenneti and Day, 2016; Yenneti et al., 2016; Baka, 2017). The abandonment of social programs to alleviate poverty from the government also contributes to an inevitable acceptance of renewable energy project not because people are happy to host such developments but because they do not have the means to either refuse nor to reject any kind of aid even if it is not proportional just to the value of their lands.

The vast majority of community members emphasised how their daily activities are closely linked with the land. Some of them pointed out the first thing to do is to go and check-up the land, others stated that they were weeding the land to feed animals, others said that they regularly grow some vegetables for self-consumption. This type of relationship amongst communities and their land can be understood as a non-mercantile valuation (Martínez-Alier, 2010) which are sometimes constructed from long-term ties with the territory, woven by stories that connect with each other based on collective memory. A local farmer captured this by stating:

> “They see our land only as a money maker. They do not care what we do with our land, they are not even interested in our traditions and how we feel about the land our ancestors gave us. They do not respect us, they do not respect our ways of living, they only care to make money to the detriment of our lives, tell me how I am supposed not to be upset about it? They cannot see how important our land is for all of us. We have been fighting for territory rights since forever. Since I remember, this is a constant battle against governments and their rich friends” (Local beekeeper).

The ties between indigenous people and their natural resources were more evident when during a meeting organised by community members, one of them was saying they have a binnacle of how the weather is every day. I asked what kind of information they include in it, and he said:

> “Everything, we observe the colour of the leaves, we write how many times a particular bird sings because that tells us it will rain, we mark all-natural changes over the year so we know how the harvesting season will be. For instance, this year we will have droughts. We compare our

> predictions at the end of the year and the results are mostly consistent to what happened throughout the year. We know the impacts of climate change are real because we observe them all the time, we keep a record of them and we prepare accordingly. We share this information but governments are not interested."

Furthermore, another community member expressed that "we are not only being affected by these projects but we are being ignored by developers and authorities, they think we are stupid because we are indigenous and did not finish school but no one knows the territory better than us". Sustainable development proposals are immersed in the neoliberal trend of national economic policy, which in many cases goes against the collective organisations of indigenous subsistence. In addition, the instruments of environmental policy planning, such as territorial ordinances and management programs, from their epistemological definition, are incapable of integrating local knowledge.

During the course of fieldwork in San Jose Tipceh, a small community where a solar project is planned to install 1 million 227 thousand panels in an area of 700 hectares that will be deforested, I observed that conflicts arose not only between landowners but also between landowners and inhabitants of the community due to the vagueness ambiguity of the Energy Transition Law forced the Ministry of Energy to conduct a consultation. As such, the law does not specify whether to consult the *ejidatarios*[12] where the project will take place or to the entire community that will bear the costs of hosting such developments. As noted in Chapter 5, nevertheless, international laws mandate to consult all indigenous population:

> "I do not belong to the ejido but I do live in this town and I have a say regarding any kind of project to be installed here, the consequences of such projects are something not only ejido members will face but the entire community" (Local interviewee).

Consequently, some community members mentioned that they did not know that they have lacked awareness of having the right to be consulted even though you

[12] Ejido members integrated mostly by men

are not a landowner. This issue has been documented by the UN in the National Human Rights Commission noted, in its recommendation No. 56/2016, that consultation meetings only recognise indigenous members who own land, which means that agrarian authorities do not represent all members of an indigenous community.

Consulting only *ejidatarios* poses important issues because rights of other groups, (e.g., young and women) also members of host communities, are being overlooked. Those community members without land ownership felt that they will bear the impacts without any benefits as reflected by a resident of San José Tipceh:

> “The main thing is to defend the territory, if we don't have the territory, we lose everything, we lose everything. That is the most important right now. Stop the dispossession, the exploitation of the territory. I might not own a piece of land where the machines will be installed but those will be in my town. I will feel the heat of the sun more intensely because they are going to deforest a very big piece of land” (Local agriculture).

Some of those lacking land ownerships have decided to attend the consultation meetings and demand their right of self-determination even if they do not belong to the ejido. By doing so, there have been conflicts during consultation meetings where the landowners stated that people from the community that does not own a piece of land have no right to be in the meetings and as such, they are not entitled to receive any compensation from the developers. In this sense, people who lack land ownership referred to the landowners who wanted the project approved without questioning the possible impacts as “being bought by the rich”, “traitors” and “the corrupted”.

Aspects of colonialism were themes that came up amongst most of the host community members. Some interviewees mentioned that the way government and promoters behave can be understood as a green neo-colonialism, while for others implementing renewable energy projects means reducing CO_2 emissions, for indigenous communities means losing their land and the ecosystem services.

In a meeting with indigenous members, local scholars and a local NGO specialising in litigation were explaining how communities in Oaxaca defended their territory legally against renewable energy developments. After this, a community member expressed that “indigenous in Oaxaca are very different from indigenous in Yucatán. We have a history that precedes us. The caste war of Yucatán[13] can explain why there are still conflicts between Mayas”. An interviewee argued that the conflicts within communities echoed what happened to the caste war:

> “In this case, the government and developers arrived in the towns and immediately approached the municipal president and the ejido president offering different sorts of things in exchange of the promise to convince the rest of the community to accept a given development. If someone opposes them, they are in charge of threatening them” (Local farmer interviewee).

This situation upset the rest of the community who eventually found out about the hidden agreements between government, developers and municipal authorities. Therefore, the general feeling within communities remains hostile in a never-ending battle. In the same vein, an anthropologist specialist in Mayan history said, “The distrust among us is not something arbitrary, we have a history that tells us not to trust alliances between government and powerful people”. Moreover, a community member said, “Those Mayas do not look after community interests, they are looking after their own benefits, they betrayed us like their ancestors and look what happened to us”. Interestingly, SENER officials stressed that when conducting consultations, it is easier than in other states:

> “In Oaxaca it is dangerous to enter the towns, community members are well organised and nothing happened without them noticing. Here in

[13] The caste war from 1847 to 1901 is explained as a war where members of a very large sector of the Mayan indigenous from the South and the East of the Peninsula, specifically those who had not been fully mediated and intellectually subjugated, led the war. An anthropologist in an interview explained that the Mayans rebelled not only against the “criollos” but also against the mestizos and mulattos that lived in ‘enemy’ territory located in the West of the Peninsula. It is claimed, this war was more properly - but not quite - inter-ethnic because Mayas fought against Mayas.

> Yucatán, the population is not so rebellious, they do not protest, they are not violent. It is somehow easier to work here in Yucatán because of this."

This could imply that the lack of community organisations, perhaps given the history that precedes it, might facilitate the deployment of the renewable developments without further scrutiny in Yucatán. Notably, the community of Juchitan, Oaxaca organised a protest against a wind energy project (Dunlap, 2014). Because of this, SENER included consultations to indigenous people as a mandatory matter (Baker, 2012). However, the developer found ways to get the project done by changing the name of the project then re-submitting it to obtain permits, and eventually it started operating. Perhaps the Oaxaca experience influenced how indigenous communities in Yucatán are organising themselves and creating important alliances to claim a seat in decision-making planning.

This view was echoed by a local scholar specialising in anthropology, who mentioned that the origin of land conflicts within any given community in Yucatán exist since the Spanish conquest:

> "There is not a surprise that members of the same community are in conflict due to these megaprojects. History precedes us. Back in the colonial years, the Spanish crown representatives made sure to divide the population through different strategies. For example, Spaniards offered privileges to those who remain on their side and obey the rules of The New Spain"

Overall, this section has highlighted that the incipient questions about the injustice of power involved in the design and implementation of solar and wind projects produce a feeling of indignation that, in addition to mobilising against imposition, is capable of producing a boost of political self-determination. There was a general feeling that, like in the past, indigenous people are left out of the development of their own towns and communities, violating international laws that México has signed. The next section highlights conflicts reported within indigenous communities.

7.3 Conflicts in host communities

A frequent reported problem was conflicts within communities. This section presents results from interviews on community members´ views of solar and wind project impacts on their localities. It should be noted that the results presented here are based on interviewees´ responses when asked about advantages and disadvantages of solar and wind developments (See Appendix A for a complete list of interview questions).

Whilst procedural and distributional justice are core elements for achieving energy justice, recognition of justice through democratic participation and a sense of giving voice to the less powerful is essential to avoid social conflicts in energy decisions (Hurlbert and Rayner, 2018). During the meeting in San José Tipceh before SENER asked me to leave, I observed how divided the community was, community members were exchanging insults loudly. The vast majority of community members interviewed expressed how worried they are because the arrival of solar and wind development only brings conflicts amongst them. Someone mentioned the ones in favour of such projects receive direct money from developers in exchange of getting the consent of those who even question the developments:

> “I have received death threats if I do not sign the lease contract, those threats came from our own neighbours. We like to live a peaceful life but with the arrival of energy projects we live with fear because we know there are hidden interests of powerful people. Here in México if you are indigenous defending your land you might get killed” (Local interviewee).

During the meeting in Merida where community members attended, I approached some of them asking for an interview. All of them stated that I can conduct the interview here outside San José Tipceh because it is a neutral space. The overall feeling was fear, a woman observed that *“*It is hard to talk about this freely, we are in danger in our towns, people with money pay to keep us quiet”. Despite being afraid, they felt they were not alone, that their “scientist friends look after us and teach us how to defend our land and our rights, it is still scary but it is worth fighting”. However, those scholars were concerned about

such life threats within host communities and someone stated that *"we are in constant communication, when they tell us about a life-threatening situation, we try to write about it in local press, we need to rise those concerns and at the very least make noise so the government authorities feel a little responsible".*

The theme of conflicts related to corruption recurred throughout the data. This was especially emphasised amongst interviewees when expressed their lack of trust in government institutions. Contrasting with national data, in a trust in institutions ranking, senators, congressional representatives, political parties and presidency rank the lowest with 5.3 for senators and the rest 5.1 in a scale of 0 to 10 (Mitofsky, 2019). A resident on one rural community under study who attended meetings with private companies and government authorities explained:

> "We know politicians will not listen to us. They have not done it so far and they will not do it in the future. Therefore, they collude to developers and pay people from our town to intimidate anyone who question those big developments" (Local woman interviewee)

The overall sentiment amongst community members is a sense of neglect from government authorities because as an interviewee stressed, they do not trust in people from INDEMAYA[14] because they have been bribed by the government. For instance, a community member during a consultation meeting organised by SENER, observed that such consultations are a "circus show" already planned to get away from what they want. Another interviewee echoed this stating that authorities from INDEMAYA are present during the consultations organised by SENER. Similarly, an ejido member stressed that "they are not on our side, instead they are on the government and private interests' side. They do not protect indigenous; they protect themselves". This echoed with Dunlap's work in Oaxaca where he concluded that wind energy consultations in indigenous territories are a bureaucratic trap that uses FPIC methodology, a useless tool with vested interests and power asymmetries in order to serve as a great mechanism to widening the political control and economic growth (Dunlap, 2017a).

[14] INDEMAYA is an state agency aiming at the implementation of public policies for the Mayan population

Likewise, there were some suggestions from community members that developers overlooked the views of the communities and acted in complicity with the government. An interviewee raised concerns about when the developers arrived in their town, “it felt like they already had everything ready to build the projects. It is clear that the government gave them permission to use our territory”. Similarly, local academics and civil society together further questioned the legitimacy of such projects by suggesting that government institutions and the private sector are colluded. For example, in different interviews some members of civil society organizations stated that one of the renewable energy developments belongs to a businessman who was in a government position and he is known as a powerful person. Overall, the findings suggest that communities and civil society organizations perceived wind and solar developments as corrupted.

In the same vein, another important observation made by interviewees is that the environmental assessments are conducted by consultants hired by the developers, which represents a conflict of interest. Subsequently, a social scientist interviewee asserted that the social assessment carried out by SENER also represents a conflict of interest because the national policy is to increase solar and wind energy generation and by doing so, they are keen to fast approve such developments without further analysis and debates on the social implications of local communities.

I also observed the distrust in institutions when I attended a claiming space meeting to debate around renewable energy developments. One of the solutions that state authorities gave to them was to submit observations to a renewable energy board. State authorities explained that the board of renewable energy advisors will evaluate the projects but the audience reacted negatively arguing that people from that board are friends of people in charge of different state agencies so they definitely do not trust them. Conversely, national government authorities claimed: “Energy Reform will bring more accountability and transparency to the Energy Sector”. During interviewees with government authorities, the general sense is that all processes involving deployment and implementation of renewable projects are following the laws.

This section highlighted the rise of social conflicts within host community members. Different interviewees expressed that they received death threats, blackmail, coercion if you even question the solar or wind project. In addition, this illustrates a ruptured relationship between government authorities and the society. Particularly, indigenous stakeholders felt abandoned and, in some ways, they felt anger towards the government. Furthermore, taken together these suggest that there is a concern that government and private developers are colluding to fast-approved projects. Overall, these results suggest that issues of corruption and distrust in government institutions surround the energy transition in México.

7.4 Contravening human rights

Interviews with community members and key informants reveal important human rights violations related to indigenous people. Throughout this doctoral thesis, I have illustrated procedural injustices, distributional injustices and some consequences of overlooked indigenous rights. This section begins by outlining national and international laws subscribed by México, and then highlights how these are overlapping the energy legislation under renewable developments.

México took an important step forward in its implementation of international human rights law by amending Article 1 of the Constitution in 2011. As a result, international human rights obligations that are incumbent in México are directly applicable at all levels of the federal structure and must be respected and upheld in legislation, public policies and judicial decisions. Such obligations include the International Labour Organization (ILO) Indigenous and Tribal Peoples Convention 1989 (No. 169), ratified by México in 1990. It also includes the International Convention on the Elimination of All Forms of Racial Discrimination, ratified by México in 1975. The American Convention on Human Rights, ratified by México in 1981, and its interpretation in the case law of the Inter-American Court of Human Rights; and the United Nations Declaration on the Rights of Indigenous Peoples.

Despite all those commitments, results suggest that energy transition in México might be overlooking indigenous rights and as mentioned in the previous

sections it could endanger biodiversity in Yucatán. During a meeting, a legal scholar explained international rights and how the Inter-American Court of Humans Rights might be the last entity, they can approach in order to defend their lands, a community member asked: “So are you telling me we have a padrino[15] Who is above the government? Are we not losing our lands?”

As noted in the previous section, results reveal a sense of abandonment from the state and a clear fear towards the government. Local activists and academics agreed on that, “the Electricity Industry Law does not establish that the consultation to indigenous peoples is binding”. The indigenous and Tribal Peoples Convention (ILO 169), which México has been a signatory party since 1992 states that indigenous communities need to be consulted when a project might affect them in any way. Nevertheless, when reviewing the policy documents, I found that Article 117 of the Electricity Industry Law establishes the right to consultation in case of occupation of land or legal servitude that affects the lands of the original peoples, but without guaranteeing the principles of ILO Convention 169. For example, the law does not clarify whether the consultation is prior to the approval of the project or before it is built, it does not define mechanisms to guarantee it is free, informed and consent. Thus, these loopholes allow granting permits for renewable projects including exploration and exploitation of the land before consulting indigenous and for long periods of 40 years with a clause of renewing the leasing for another two periods of 40 years without any further consultation. This implies a clear threat to the “prior” condition, included in the right of consultation of indigenous peoples. The result suggests that in such consultations, the specifications regarding the objectives of the prior consultation generated controversies. Given that for many movements that defend indigenous rights, it should be linked to the right to self-determination and territorial autonomy, while for companies and some state agencies the criterion of consultation should be closer to the idea of negotiation (Gonzalez and Del Pozo Martinez, 2016).

Community members felt disappointed with the consequential laws of the Energy Reform and the lack of trust in agrarian laws. There was a general concern of

[15] The exact translation would be godfather but the interviewee refers to a protector body

how privatising the energy sector can become the beginning of privatizing the land and ultimately vanish their cultural heritage:

> “They want us to disappear because we are a tiny stone in their shoes. Now they come to our towns promising economic prosperity in exchange for our lands but where were they when we had money to eat” (Local interviewee).

> “Something similar happened with the Agrarian Reform, the main purpose was to privatise communal lands under the false promise of benefits from private ownership. In reality, it was because most of the communal land represents a barrier to big developers and their infrastructure” (Local scholar with expertise in sociology interviewee).

The vast majority of scholars expressed that international laws have been a key factor to legally halt wind and solar developments. However, they also agreed that indigenous rights violations should not exist because of the existence of those protecting laws. This was echoed by a member of the collective Articulación Yucatán: “Even the UN relator has visited some renewable energy parks and nothing has happened in communities´ favour”.

The environmental justice atlas reported 154 cases of social and environmental conflicts in México (EJatlas, 2021). Despite this, both national and state government officials´ interviewees asserted indigenous rights have been respected. For instance, a national government interviewee assured that “México has strong mechanisms to protect indigenous rights and that renewable energy projects should not be a threat to them”. State authority interviewees also mentioned, “Indigenous rights have been procured but it is not up to us to decide what prior means, if it is prior to the project being accepted or prior to building it”. Certainly, results here offer evidence that indigenous rights have been overlooked as, among other things, the right of self-determination is not respected by imposing solar and wind projects on their lands. This will be discussed in the following section.

7.4.1 Misrecognition of self-determination

This section highlights how indigenous peoples expressed their desire to define and pursue their own economic, social and cultural development, in accordance with international standards, as a fundamental means of exercising their right to self-determination.

Some members expressed that they believe that being indigenous is perceived poorly by the policymaking elite. Community members felt neglected by the government authorities and in general anyone with power. A community member explicitly expresses interest in participating in policy making. However, it was acknowledged that historically indigenous peoples have been left out of the energy transition.

> "I disagree with their [politicians] ways of making policies. They do not know our town, they do not know what we do, and they obviously do not know what we need. The way of policymaking should change. I would like to see those men in suits coming to our town and ask us what kind of life we want. We need to have a say in the development of our own town, we live here, and they do not" (Local interviewee).

The interviewees expressed they received insults and intimations:

> *"*I saw friends of the communal president with developers drinking beers. They threaten me, they [the people close to the communal president] told me the development is happening whether you like it or not, stupid black dwarf" (Community member from Suma de Hidalgo).

Among indigenous peoples, there was an overall sentiment of being neglected because of being Mayas:

> *"*They think because we are Mayans, we are ignorant but we are not. They think we do not understand and they constantly patronise us. I am sick of it" (Local woman interviewee).

On a different note, the vast majority of interviewees from host communities reported that their enjoyment of the self-determination right was limited, however, by the development models imposed on their territories and, in particular, by the increase in renewable energy projects that has resulted from legislative reforms and economic policies having a negative impact on their rights and interests. Several indigenous interviewees claim to have been denied the right to self-identification by government authorities. This was particularly echoed by a handcraft woman stating:

> "they told me I am not Mayan according to their data. They are telling me what I am and I consider that very rude". In addition to this, a beekeeper expressed: "They decide if we are indigenous or not and of course they are saying we are not so they do not need to conduct a consultation".

Interviewees generally emphasised that there were no effective and cultural mechanisms of inclusion. In fact, it was reported that some of the consultation meetings were held during important celebrations such as "the day of the dead", a well-known Mexican holiday, leading to a low attendance and local communities not being informed:

> "They did the consultation on the Day of the Dead, of course all of us were paying respect to our dead. We all were busy in hannal pixan[16] and we never found out what that meeting was all about. You might think they are foreigners, they do not know, but our government was aware of such meetings, they should have told them. However, I believe they did it on purpose" (Local elderly interviewee).

By way of contrast to interviewees and participants at the local case study, interviews who are representatives of national authorities claimed that consultation processes are held in accordance with the law. They argued that the processes are transparent and free of coercion, and take into account the needs of Mayan communities:

[16] In Maya means food for the souls

> “The rights of indigenous communities have been respected, a proof of that is a protocol that we design to conduct the consultation processes according to the characteristics of a given community” (SENER interviewee).

When asked community members if they want to host such energy projects, the vast majority argued that they do not see any benefits, the processes are not transparent and the community is divided:

> “If you ask me, they are not being transparent, they do not ask our permission, they just want to build the parks to make money at our expense, the expense of the Mayan people. If business and government truly ask our opinion, they would know if we ever would have wanted renewable energy projects in our territories they would have to be managed and owned by us, the members of the communities.”

The rapid approval of wind and solar projects and their implementation have caused protests, conflicts within communities, and those who claim their rights have been stigmatised. For instance, in a press release local representatives from industry asked State authorities “to not delay development just because a minority is against foreign investment” (Fitzmaurice, 2018). In a response to local industry and authorities, academia and members of indigenous communities released their own press release stating among other things that “It is not the indigenous communities that represent an obstacle for development, but the constant violations of the rights of the Mayan communities to exercise their self-determination and the protection of their lands, territories and natural resources, which constitutes a real threat to fair, equitable and sustainable development in Yucatán” (Articulacion, 2018).

A frequently raised point during interviews and meetings is how eager host communities are in developing their own future:

> “they imposed these big projects, they never ask what we think and they do not take into account how we see our future, we have other ways. Back in the day we used to eat from the land and mother nature, now they

> impose agroindustry projects, solar projects, monocultures. Our way of using natural resources is sustainable, the way power people with big industries are destructive" (Community member from Ticul).

An agricultural engineer echoed this and expanded by stating that "the milpa method is sustainable and it provides food security to the towns but we have seen how governments promote large scale agriculture that ends up damaging the quality of soil for future crops."

According to interviewees of host communities, big projects only led to people migrating to the capital looking for jobs to be able to afford food. A few women discussed how their husbands and sons commute 2-3 hours a day to Merida because there are not government subsidies for agriculture like there was before:

> "It is a trap, they cut the subsidies for the milpa, people with money and the government decided to install solar parks promising we would have money to eat but it is a lie, we do not want money we want to eat from our land like our ancestors did" (Local farmer interviewee).

> *"*We are not against renewable energy, we are not against helping mother nature, we live here, we all live thanks to natural resources. We are against the way the government and developers are blatantly implementing such projects violating our rights and environmental laws. They do not want to help mother nature; they just want more money. More power" (Community member interviewee).

Alongside, a community member expressed that *"*there are no possibilities of owning an energy project" because the business model adopted favours economic and technical criteria. A young woman from Tizimín mentioned that "it would be better if the government helped communities to build our own energy projects, in that way we could use that energy for our homes and then reduce our energy bills". Conversely, another community member mentioned that the idea of having their own energy projects is not bad but to really own such projects it should be in response to the needs of the town, we should collectively reach that

conclusion and not the other way around. Other community members interviewed see the scale of the projects very problematic.

> “I think they destroy thousands of hectares because they want to earn more money but they should think about the climate crisis they are attempting to tackle; would it not be better to do it at a much smaller scale?” (Local interviewee).

> “What if instead of destroying our lands, they offer the opportunity to install solar energy on our roofs, so we can sell it to the government? They do not care about being kind to nature, they care about making money” (Local woman interviewee).

Overall, the results highlight that failing to recognise indigenous rights might lead to a violation of their rights. This section shows that the development and deployment of solar and wind projects in indigenous communities are overlooking the self-determination right of the Mayan population. In this sense, this translates into delays of RET implementation in Yucatán. Moreover, the results here suggest that the scale of development matters significantly more than the particular technology for promoting socio-political energy justice (Banarjee *et al.*, 2017). It suggests that México should offer and encourage energy communities operated by and for community members if they accept to host such projects. This poses enormous challenges and requires government aid but it might allow empowerment of such communities.

7.5 Women and the energy transition

In-depth interviews with indigenous women revealed underlying stories about how they engage with solar and wind projects in their towns. Another important theme emerging in the data was the many obstacles’ women face when claiming their rights. This section presents results from interviews on women´ perceptions concerning their role within the energy transition in Yucatán.

Notably, both the INDC and the SENER policies have included aspects of gender in energy systems. For example, the aim to generate 43% of clean energy by 2030; substitution of heavy fuels for natural gas, clean energy and biomass in national industry; 25% reduction in methane leaks, venting and controlled combustion; and control of soot particles in industrial equipment and installations (INDC, 2015). These policies and actions include a cross-cutting human rights and gender perspective in order for the measures to be implemented to take into account women as important decision makers regarding energy consumption. They also emphasise the importance of implementing them such that they do not exacerbate the impacts of climate change that already have disproportionate adverse effects based solely on gender (INDC, 2015). Furthermore, INDC establishes is fundamental to incorporate a gender and human rights approach into capacity building, prioritising the most vulnerable sectors and regions in order to reduce social inequality and the gap between women and men rights (INDC, 2015). In practice, at least in RE developments in Yucatán, the approach authorities and developers have had in the communities still do not include mechanisms to promote participation of women in the information/consultation processes where most of the time, women cannot be part of the debates due to housework activities but also due to lack of land ownership. This result aligned to the claims made by Capaccioli *et al.*, (2017) where they call for greater attention to women if seeking energy justice outcomes.

Results also reveal that among indigenous peoples, women have been even more excluded from the energy transition in Yucatán. As mentioned in the previous section, I had the opportunity to attend several meetings as I was invited by community members and by some scholars. The meetings were mostly led by men and most of the attendees were also men. The ratio of attendees amongst indigenous peoples was approximately 70% men and 30% women. Concerns amongst women on renewable projects implementation were related to the insufficient facilities to conduct consultation meetings. The majority mentioned that authorities and promoters bring food, music and presents to such meetings but do not include day-care facilities:

> “I know more women who would like to come to this meeting but we have children and we have to take care of elderly family members. I am here with my daughter because even if she gets bored, I would be able to tell her I fight for our rights but all women do not have the option” (Local woman farmer interviewee).

Another important factor concerns how women are participating in meetings regarding the future of their lands. As one said *“*We are the ones who harvest the land, we feed the livestock, we prepare food with vegetables from the land and yet we have no rights on whether or not to install solar and wind projects. It is outrageous.” A craftswoman expressed that due to lack of job opportunities within communities, their husbands had to migrate to the United States. It is particularly important to highlight the existing inequality patterns within indigenous communities. On the one hand, land tenure is usually not transferred to women, which reduces their decision-making capacity in the *ejido* assembly. On the other hand, men frequently have migrated to the U.S. or have grown old and are unable to work in the land. This entails the emergence of various conflicts, especially if the community members negotiate financial benefits that deepen the inequalities between them (Zaremberg et al., 2018).

In another case, an interviewee expressed that ejido authorities tried to discredit a woman who raised her voice questioning the impacts of renewable projects:

> “Some men friends of the ejido president tried to discredit this woman, arguing that she has no moral authority to say anything as she is living with a married man. Because of it, this woman stopped attending the meetings”.

Another theme brought up by some women is that during the public meetings or consultation meetings held by developers and/or ejido authorities is that women felt men do not question such developments because they do not dare to ask important matters:

> “During meetings, men never asked questions, my guess is that they feel embarrassed, so women are the ones who really are asking important questions even though they are a minority in the meetings.”

> *"*They use our culture for profits, they sell us as folklore, they show our clothes as colourful. We are a commodity but the profit is divided by the non-indigenous. They get richer at our expense and they do not let us decide on our future"

Results of this study show that indigenous women face even more obstacles of claiming their rights within the energy transitions in Yucatán regardless that in official documents incorporates women participation. On one side, lack of land ownership due to the redistribution of land compounds mostly by men even though women claim they are the ones doing a lot of work in communal lands. On the other side, women have been questioned about their opinion due to their behaviour considered not socially acceptable for women. This represents an important issue and constitutes a misrecognition of justice.

7.7 Chapter summary

This chapter critically analysed the results on recognition of justice within indigenous communities facing the approval of large-scale solar and wind projects. The chapter expands on issues related to the process of implementation such energy technologies (Chapter 5) within indigenous host communities, as well as advancing the re-distribution of burdens and benefits (Chapter 6) among indigenous communities whether or not they own a communal land. The discussion presented here centred in the challenges faced by indigenous communities, conflicts brought up by RET developments and contested land issues which emphasized the implications of this research´s findings on: (1) addressing indigenous rights violations within RET developments, (2) introducing energy generation alternatives at lower scales, (3) understanding the complexity of carrying out RET projects in communal lands and (4) the double challenge indigenous women face when claiming their rights.

Undoubtedly, if México seeks to transition to a low carbon energy system it should include less-heard voices into the energy decision making to secure fair and equity outcomes (Roddis *et al.*, 2018). Host communities need to be included in inclusive participatory processes based on mutual respect and where stakeholders have the opportunity to scrutinise and to influence outcomes;

ultimately this could help to legitimise decisions (Dryzek, 2012; Huesca-Perez and Sheinbaum-Pardo, 2016). More importantly, there is a need for a commitment by regional institutions, policy-makers, energy industry leaders and state officials towards identifying and serving the most vulnerable communities – in lieu of mimicking the lifestyles, consumption patterns and aspirations of Western societies.

The establishment of energy and extractive projects undermines the ownership of the land of ejidos and communities and the rights to the territory of indigenous peoples, in addition to destroying rural life. Hence, these initiatives have generated hundreds of resistance movements. Some of the results here underline that other approaches of renewable energy ownership should be considered because incentives for local communities´ involvement is the potential for shared public–private ownership of energy assets (Heffron and McCauley, 2014).

Certainly, market-oriented energy policies in México are lacking both procedural and recognition of justice, perhaps shifting from market-driven mechanisms towards community management and ownership might enable energy justice principles in renewable energy developments in the country. Energy policies should be treated as a matter of human rights. México should take into account and centre the policies where the ultimate goal can be participatory civil society control over energy processes, reflecting interests of a broader range of stakeholders as most successful cases providing good communication are normally the ones who offer community participation in the assets of the project (Bedi, 2018).

Experiences in the country of wind and solar energy production have not meant a change to an open energy system. The Mexican government has maintained a concession policy to foreign private companies that allows them to maintain the concentration of power generation for their benefit, while environmental costs are borne by the communities. This section highlights structural characteristics of social and economic inequalities within RET projects. It provides evidence of imbalanced development; it suggests that México through national policies

aiming to achieve international environmental commitments outweigh local benefits.

The results here support that sustainable renewable energy developments require a human rights-based approach. For example, reaching the Sustainable Development Goals (SDGs) and their overall ambition of “leaving no one behind” will require specific attention to the rights, aspirations, and participation of indigenous women and men. Including aspects of recognition of justice with nuanced power relations might enable effective and coordinated measures by institutions throughout the federal, state and municipal system. Including changes to the legal, political and institutional framework to ensure the realization of the rights of indigenous peoples in key areas such as lands, territories and natural resources; their own development priorities; self-determination; political participation; and access to justice.

Results illustrate a disconnection between the government and communities. Perceived injustices manifested through social structures and institutions that ignore, misrepresent or reinforce inequalities, and through social processes that limit possibilities for expression and ostracise minorities (Fraser and Honneth, 2003; Swanson, 2005). This research showed that policies should no longer reflect a welfare-based approach but rather a human rights-based bottom-up approach that promotes the self-determination of indigenous peoples and takes into account their own proposals and priorities, ensuring the full participation of indigenous peoples in the preparation and development of such programmes and policies (Hurlbert and Rayner, 2018).

Chapter 8: Conclusions

Let's wake up! Let's wake up, humankind! We are running out of time. We must share our conscience free of the rapacious capitalism, racism and patriarchy that will only assure our own self-destruction

- Berta Cáceres

This chapter summarises the key findings, conclusions and critical reflections from investigating the impacts of development, deployment and indigenous responses to solar and wind energy in Yucatán. Section 8.1 summarises the key findings and contributions of this research and how they address the objectives outlined in Section 2.6.2. Furthermore, Section 8.2 offers recommendations for policy, industry and future research on this subject. Finally, this chapter closes this thesis with section 8.3, concluding remarks.

8.1 Key findings and contributions

Utilising the energy justice framework as a tool of where, how, when injustices occur in energy systems offer an alternative solution to highlight where injustices occur within the development and deployment of solar and wind projects while also addressing issues of who is bearing the cost of energy developments. The three tenets of energy justice have the ability to see through aspects of procedural, distribution and recognition of justice. For example, distributional justice insights showed that wind and solar energy development necessitate further critical empirical enquiries for highlighting the overall global configurations of RET projects. This is especially important regarding the social and ecological impacts generated by wind and solar infrastructures, which require large quantities of mineral extraction (Dunlap, 2018; Mulvaney, 2013; Sovacool et al., 2020). In addition, results here echoed research conducted by Yenneti and Day (2016) and drawing on the accounts of community members of Yucatan, distributional injustices were found. On one hand, the Mexican government seems to work under utilitarian principles where dispossessing of land resources to indigenous communities is justified by national economic development and the

need for carbon emission reduction targets. In this sense, the use of the land to fulfill host communities' needs are also endangered and the lease payments of the land are not evenly distributed to all members of the community. These results have some policy implications. First, renewable technologies are not inherent just, and as discussed in Chapter 5 and 6, can create social inequalities. Therefore, energy policies should be scrutinised and government arrangements need to take serious commitments to the host communities and ensure they are delivered. Proper mechanisms should be adopted to ensure that the burden-bearers are not always the poor and marginalised social groups.

The recognition of justice tenet highlighted that land acquisitions for wind and solar projects can alienate vulnerable Mayan communities from their sources of livelihood, and thus, increase inequalities. Failure to implement just and legitimate procedures in land leasing is not only crucial to widening the precariousness of marginalised communities, but it also decreases communities' trust in political institutions. The results recognised the value of the concepts of recognition of justice to illustrate the struggles faced by the Mayan communities in Yucatan, especially Mayan women who lack land, which becomes more important as solar and wind energy is rolled out on a global scale. In Mexico, there are more than 60 indigenous cultures, thus further analysis of wind and solar implementation in other states, would offer useful comparisons and a deeper understanding of specific aspects of recognition of justice concerns arising from the ambitious national energy policies.

This research has illustrated the value of the application of procedural justice to solar and wind energy developments. The empirical results found that providing detailed information in inclusive communication mechanisms, valuing local knowledge, addressing communities' concerns and securing the involvement of all affected communities with representation of marginalised groups, in solar and wind project implementation are essential for protecting the interests of the community and promoting distributional justice. Failure of procedural justice in the deployment of large-scale energy projects in developing economies like Mexico is problematic because it can impact the social acceptance of wind and

solar energy projects (Velasco-Herrejon and Bauwens, 2020), and it can also perpetuate and widen inequalities and silence the voices of powerless and lower social groups, such as Mayan population. Implementation of procedural justice should include the ability for Mayan population to affect outcomes of energy projects located in their territories. As discussed in Chapter 2, energy justice highlights that changes in energy systems must address inequalities in power and injustices across the energy systems. However, it falls short of enquiring how these injustices historically arise and embedded themselves. Therefore, the incorporation of the power cube enables both historical and spatial forms of injustice to be examined in-depth into the relations of power among different stakeholders. For instance, the power cube enables to assess that public consultations organised by government officials and/or developers are not enough to ensure procedural justice in wind and solar developments. Policy makers need to recognize that organising meetings with developers and host communities to decide where or how - not if - solar and wind projects are built is a relatively weak approach to community engagement and may have limited positive impacts. This led to host communities and civil society organising, claiming their own spaces to exercise their right of full information disclosure and their fulfilment of their rights as well as demand a seat at the table. Energy policies should shift private large-scale energy projects to a more inclusive decentralised energy system aligned to the environmental, cultural and social aspects of host communities.

Academic literature on wind developments in Western countries has procedural (Simcock, 2018; Pesch et al., 2017), distributional (Roddis et al., 2018) and recognition injustices (Gillar et al., 2017). However, results here resonated with case studies conducted in India (Yenetti et al., 2016; Yenneti and Day, 2016) , Chile (Hernando-Arrese and Rasch, 2022), Colombia (Corredor, 2018) where there are pressing concerns about land dispossession in indigenous lands, poor engagement mechanisms, power asymmetries on benefits and burdens of the energy transition.

Renewable energy developments in Mexico haven been critically discussed by Velasco-Herrejon and Bauwens (2020), Howe and Boyer (2015) and Dunlap (2016, 2017, 2018) in southern Mexico. Their focus is on Oaxaca which was the

first node of investment in RET in Mexico. In their work, they highlighted indigenous rights violations, limited participatory spaces and asymmetries of power. This research showed that RET investments are expanding into new peripheries of Mexico, where land is cheap, and perhaps there was a perception that investors and firms can replicate such injustices in Yucatan, as local residents cannot really question it. Although some findings resonate with literature of wind developments in Oaxaca, findings here showed that residents questioned wind and solar developments in Yucatan. In fact, residents of Yucatan organised and demanded to be included in energy decisions. The results here showed that injustices occurred in wind projects similar to solar projects in Yucatan. Energy justice for Mayan communities in Yucatan means to have the ability to say no to any energy project; energy justice means full information disclosure in Mayan; energy justice means that local communities cannot be discriminated by government officials and developers; Energy justice means to have a say even if you are not an ejido member; energy justice means including indigenous women in all decisions affecting their livelihoods; energy justice means rejecting land dispossession in the name of climate change.

The concluding remarks of this doctoral thesis emphasizes that the energy transition should not be only a mere technological substitution because if it is, this could endanger the livelihoods of host communities exacerbating existing inequalities (Koengkan et al., 2020). The energy transition should include a broader participation in decision-making (Bosch et al., 2019; Negenborg, 2018) and in-depth environmental analysis of the synergic impacts of large-scale projects (Bastos et al., 2016). More importantly, the transitions towards a low-carbon economy cannot be to the detriment of disadvantaged populations (Jakob et al., 2019; Chávez, 2018).

The key findings and contributions of this research and how these fit within the objectives that it sought to answer are outlined below.

Objective 1: analyse the deployment of solar and wind projects under the new institutional and legal framework in Yucatán

The three empirical chapters of this study presented insights about how solar and wind projects are being implemented in Yucatán under the new energy

policy framework. This objective was, addressed specifically in Chapter 5, illustrating that institutional changes from the Energy Reform are overlapping existing international, environmental laws and the Mexican Constitution. For example, the national policy of the ETL opposes the international labour organisation convention No 169 of indigenous and tribal peoples, because it prioritises all energy developments above any other activity. In addition, all consultation processes are conducted with a lack of accurate mechanisms of participation.

Furthermore, results here suggested that there is a lack of coordination between different levels of government in Yucatán and México. The national energy auctions to boost solar and wind energy generation relies heavily on economic and technical factors. When approving such projects at a national scale, there is little to no room for state or municipalities to have a say in the design nor the implementation of large-scale energy projects. Likewise, at the time of writing SEMARNAT has not conducted an Environmental Strategic Assessment in Yucatán as mandated in the ETL. However, several wind and solar projects have been approved by SEMARNAT. During the many meetings and interviews, the Environment Ministry recognised the absence of such assessment, arguing there was a lack of financial resources. These findings confirm that energy policies made at national level might have negative impacts on the host livelihoods to be located because it overlooks not only the unique ecosystems of the region but also to the people who inhabit such territories.

As discussed in Chapter 4, despite all international commitments México has signed, both related to in indigenous rights and environmental targets aiming at reducing climate change impacts, the energy policies are far away from being just while achieving their goals. If México seeks a just and sustainable transition towards a low-carbon economy, policies should be reoriented to include better energy policies beyond large-scale projects for energy production. As this thesis has demonstrated, market-oriented energy policies in México are currently lacking both procedural and recognition of justice, perhaps shifting from market-driven mechanisms towards community management and ownership might enable energy justice principles in renewable energy developments in the

country because policy design should consider the interplay of economy, society and nature in order to achieve a just energy transition.

Objective 2: identify and analyse the actors´ attitudes and perceptions to solar and wind energy

This research consistently emphasised the need to overcome the fragmented relationship between government and civil society, especially indigenous peoples. As deduced from findings of this research, this requires government and industry actors to work together in respecting the rights of indigenous population and environmental laws.

Results from in-depth interviews with indigenous communities revealed a general sense that solar and wind projects bring more dis-benefits than benefits (Chapter 5 and 6). Results suggested that projects cause multiple conflicts within host communities. Corruption and the use of non-transparent strategies to obtain land permits are the main concerns of members of indigenous communities (Chapter 7). In addition, energy generation from solar and wind projects would not be used by host communities due to the current policy design. Instead, the energy produced in these projects is oriented towards large industries such mining companies (industrias Peñoles), building materials (cement) industry, beer companies, among others. In this sense, this “clean” energy is used by some of the industries that emit larger CO_2 emissions.

In particular, a key finding relates to the issue of land dispossession, and how this occurs under the pretext of addressing climate change. The discourses of governments and promoters used to get approval of such RETs projects are based on climate change concerns. However, community members and local scholars expressed that such rationale contravenes the preservation of local ecosystems. In fact, local scholars have emphasised that deforestation for solar parks might cause more damage to the environment and local biodiversity. In the same vein, there were concerns about the installation of wind turbines close to environmentally protected areas and in close proximity to coastlines and national protected areas.

More importantly, the findings suggested that the major affected overall were the host community members, who lost the common land resources on which they relied. The findings here suggested that the ejido – community ownership of the land – has somehow helped the defence of Mayan territories. Certainly, as shown in this thesis, the communal land has issues with granting lease permits because the ejido president might have orchestrated false assemblies in order to get signatures from ejido members. However, due to the increasing social organisations of Mayas and overall local communities and the alliances with advocacy and local academia, such organisation has served to prevent, in some cases, land dispossession. The participation and claiming spaces to be able to influence energy decision-making has increased transparency and at the very least as mechanisms to scrutinise large-scale wind and solar projects.

Drawing on the accounts of different stakeholders interviewed, results here showed that there is a strong case for claims of injustices in this distributional picture in the meantime, governments of Yucatán and México apparently work to utilitarian principles whereby the dispossession of land resources from a minority group is justified on the basis of achieving climate change targets in terms of national economic development.

This research offers evidence that energy injustices are borne by the most vulnerable and marginalised people. In Yucatán, indigenous people are struggling to battle against wind and solar large-scale projects, whose benefits accrue to distant consumers rather than themselves. Their rights have been violated and they are at risk of losing their lands through dubious land contracts. To them, land means everything, from food supplies, customs and traditions. In addition, industry leaders have explicitly expressed that indigenous cannot halt the development of the region.

Additionally, the study has suggested that women are eager to be involved in energy decisions but are limited due to lack of land ownership. The key finding in this regard is due to the way land was distributed in the Agrarian Reform benefiting only men. In this sense, efforts should be focused on recognising the rights of women to be owners of land.

Moreover, the results here underline that other approaches of renewable energy ownership should be reconsidered because of incentives for local communities´ involvement in the potential for shared public–private ownership of energy assets. Injustices were found in both solar and wind projects, which implies that injustices do not occur on a specific technology but in how energy policies are made and implemented.

Overall, and in the larger picture, this research has outlined the importance and urgency of ending oppression of indigenous populations, ensuring justice for the marginalised, establishing inclusive democracy and reflecting on how to reconstruct the energy system as a pressing matter. Overall, injustices were found in both solar and wind developments suggesting that it is not a technology issue but the constant neglect of private investors and governments towards citizens, especially a historical overlooking of indigenous rights.

Objective 3: analyse the participation of indigenous communities in the design, approval and deployment of solar and wind energy developments

Empirical findings from this study have expanded current understandings of the actors involved in RET projects in Yucatán as an emerging frontier of RET developments in southern México (following Oaxaca). Analysing solar and wind projects using energy justice encompasses different perspectives regarding procedural justice, distributional justice and recognition of justice. More importantly, this research proposed a framework to analyse power dynamics within energy justice studies.

Addressing power dynamics on solar and wind projects through the power cube enabled an understanding of the different participatory spaces in which energy policies are taking place. It was shown that power is not something that cannot change, it highlighted how power can shift depending on the spaces where it is exercised. Furthermore, findings suggested that energy policy-making under closed spaces might lead to the creation of new and more inclusive participatory spaces, where community members, local scholars and citizens demand their right to be included in energy decision-making, in which the consultation processes are not just a tick-box exercise. This research strongly emphasised

that indigenous peoples have agency and can be active participants instead of mere recipients of energy developments.

Finally, the findings have outlined that México should take into account and centre the policies where the ultimate goal can be participatory civil society control over energy processes, reflecting interests of a broader range of stakeholders. Most successful cases providing good communication are normally the ones who offer community participation in the assets of the project. It is important to reflect on the appropriate participatory methods that could help communities to express their concerns as well as explore the ways in which decision-makers can involve the different territorial levels that are affected by an energy project in a constructive way.

8.2 Recommendations

This section outlines policy recommendations for policy makers, industry stakeholders and for future research.

For policy actors, it is a key of importance that energy policies are designed and implemented taking into account the characteristics and needs of the region. Furthermore, as discussed in Chapter 4, such energy policy outcomes should incorporate local knowledge as well as respecting the rights of indigenous population to their self-determination, as mandated by the Mexican Constitution, and Indigenous and tribal people's convention ILO 169, an international commitment Mexico is a signatory country. This means that energy policies should incorporate local dimensions in accordance to the population needs. Hence, policy support will be instrumental in (1) enabling environments for policy-makers, academia and indigenous communities to collaborate prior energy projects are approved so that barriers in achieving a just energy transition may be overcome; (2) encouraging investments in alternative mechanisms to generate wind and solar energy; and (3) stimulating financing to strengthen environmental and social institutions. This is important as the Strategic Environmental Assessment (SEA) has been missing and it is necessary to carry

out in regions like Yucatan as mandated in the Energy Transition Law of the Energy Reform. The SEA could potentially include the visions of host communities as well as evaluate sustainable decision making.

For industry actors, including technology developers and project implementers. This research provides concrete evidence on the need to understand and respect the local context where solar and wind energy initiatives will be deployed. As shown in the case study investigated in this research, there are underlying and power dynamics that could influence how wind and solar projects might be accepted. In order to avoid technology-driven initiatives, it is important for developers to ensure that (1) the design, model and scale of the technology aligns with community needs and existing (social and environmental) capacities; and that (2) solar and wind technology do not negatively impact current livelihood activities as much as possible. It is also relevant for developers to understand that participation does not equate to merely consulting not only land-owners but the entire affected community as well as understanding their perceptions. The findings here agreed on what Yenneti and Day (2015) found, consultations require two-way channels of information, meaningful engagement with all the community members, and more importantly the ability for local communities to actually shape the energy outcomes, with the possibility of turning down projects that are not adequate for their self-determination and environmental characteristics. Instead, as a result of this research, engaging with host communities means co-learning, co-developing and co-creating solutions with them in order to avoid impositions.

For future research. The natural progression for the research in this subject is to take the proposed energy justice framework along with the power cube and apply it in other regions of México and elsewhere, especially to those regions with large indigenous or other minority populations, such as Chiapas, Michoacan, or elsewhere in Latin America. In addition, this framework could replicate it in a different context (for example, transferability for a different renewable energy technology in a different community or country). Future research can include a team of investigators dedicated to different parts of the state, in order to gain a

more complete picture of the dynamics on the ground. Finally, future research should also consider using this framework analysing the role of women within just energy transitions in México and elsewhere.

8.3 Concluding remarks

This doctoral thesis has explored the impacts of solar and energy developments in Yucatán, México advancing energy justice literature by incorporating power dynamics analysis. It has provided insights from the front lines of such projects through the perspective of multiple stakeholders, demonstrating that lack of coordination between levels of government as well as energy policies made at national level led to procedural, distributional and recognition injustices by overlooking the environmental characteristics of the region and the rights of indigenous communities to participate on decisions that might impact them. Findings from this research not only contributed to current understandings on how issues in marginalisation of local and indigenous communities within solar and wind developments could be addressed through greater opportunities for engagement, fairer distributions of costs and benefits, and more transparent flows of information in accessible formats, but also offered significant qualitative insights into energy justice research, including the need to consider questions of political power. Ultimately, this research has shown that such developments are not inherently just nor clean, and if the country seeks to be more than a leader on paper and laggard in practice, this time *we* definitely cannot leave anyone behind.

Glossary

CDI	Comisión Nacional para el Desarrollo de los Pueblos Indígenas – National Institute of Indigenous Peoples
CENACE	Centro Nacional de Control de Energía - National Centre for Energy Control
CFE	Comisión Federal de Electricidad - Federal Electricity Commission
CONACYT	National Council of Science and Technology
CONUEE	Comisión Nacional para el Uso Eficiente de la Energía (National Commission for the Efficient Use of Energy)
CRE	Comisión Reguladora de Energía Energy Regulatory Commission
EIA	Environmental Impact Assessment
EIL	Energy Industry Law
ESA	Environmental Strategic Assessment
ETL	Energy Transition Law
FPIC	Free Prior Informed and Consent
GDP	Gross Domestic Product
GHG	Green House Gas
ILO	International Labour Organization
INDC	Intended Nationally Determined Contribution
INDEMAYA	Instituto para el Desarrollo de la Cultura Maya del Estado de Yucatán
IRENA	International Renewable Energy Agency
LGCC	Ley General de Cambio Climático - General Law on Climate Change
NGO	Non-governmental organisation

PEMEX	Petróleos Mexicanos - Mexican Petroleos
RAN	Registro Nacional Agrario – National Agrarian Registry
RET	Renewable Energy Technologies
SDG	Sustainable Development Goals
SEDUMA	Secretaría de Desarrollo Urbano y Medio Ambiente – Ministry of Urban Development and Environment
SEMARNAT	Secretaría de Medio Ambiente y Recursos Naturales - Mexican Environment Ministry
SENER	Secretraría de Energía - Mexican Energy Ministry
SHCP	Secretaría de Hacienda y Crédito Público - Mexican Finance Ministry
SIA	Social Impact Assessment
UNFCCC	United Nations Framework Convention on Climate Change

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ANNEX A

UNIVERSITY of York

Interview Protocol

The following questions will be read in Spanish

The rise of the wind farms: the good, the bad and the ugly

Indigenous community

- What do you think were the main reasons for the development of wind farms in your area?
- How did you find out about the wind farms in your community?
- What kind of information about the wind farms did you receive?
- From your perspective, what are the main benefits of the development of the wind farms? Who do you think are the beneficiaries of these wind farms?
- What would you say are the advantages and the disadvantages of the wind farms? Do you think there are any problems?
- Have you been involved in the developing of wind farms? Could you describe your involvement and/or activities that you have participated in?
- From your perspective, who are the most active groups in selecting which renewable energy projects are being implemented here?

NGO, Research Centres and Academia

- What do you perceive to be the main advantages/disadvantages involved in the development of the wind farms?
- Who do you think are the main beneficiaries from the wind farms developments?
- From your point of view, how has the consultation processes surrounding the adoption of renewable energy taken place in Yucatán?
- Have you been involved in the developing of wind farms? Could you describe your involvement and/or activities that you have participated in?
- What kind of information disclosure about the wind farms did you receive? How did you find out about them?
- In your opinion, what considerations have been taken regarding to the information disclosure provided to the communities about wind farms?

- In your opinion, will the siting of wind farms in Yucatán ensure energy security in Mexico?
- What is the energy generated from wind farms going to be used for (i.e. export outside the country, send to the grid, use locally)? Are they connected to decentralized mini-grids, or utility scale grids?

Government authorities

- Have you been involved in the developing of wind farms? Could you describe your involvement and/or activities that you have participated in?
- What do you think were the main aims of energy policies such as the Energy Transition Law adopted in 2015?
- From your perspective, what are the main benefits of the development of the wind farms? Who do you think are the beneficiaries of these wind farms?
- What do you think are the main obstacles of the implementation of wind farms in Yucatán, Mexico?
- From your point of view, how has the consultation processes of adopting renewable energy in Yucatán developed?
- I What considerations have been taken regarding the information disclosure provided to the communities about wind farms?
- What is the energy generated from wind farms going to be used for (i.e. export outside the country, send to the grid, use locally)?
- What do you think are the main changes for the country once the wind farms are established? What about for the communities?

ANNEX B

Project Information Sheet

About the project

The research project aims to analyse the social impacts of the siting of renewable energy infrastructure. Particularly, it aims to identify the benefits and burdens of wind farms developments in rural areas in South of Mexico. Furthermore, this project analyses wind farms and the role of different stakeholders such as rural communities, international and local non-governmental organisations, academic and research institutions, private and public sector organizations at multiple levels of governance. In addition, this research aims to critically asses the role of governance within the wind farm developments and its impact on rural communities. This research has been approved by the Ethical Review Committee of the University of York's Environment Department.

About the interview

During the interview, you will be asked to provide your personal perspective and experience regarding wind farm developments in Mexico. Participating in the interview is completely voluntary. You will be given a copy of this information sheet and will be asked to sign a consent form. You can withdraw your participation at any time.

The interview will last between 30 and 45 minutes and it will be recorded for transcription purposes. The recorder can be turned off at your request at any time during the interview. The recordings will be used for research purposes only. If you do not agree to being recorded, you may still take part in the study and I will take notes of your responses. The results of the research project will be shared with you if you wish.

The information you provide will be used to guide research publications. Publications will include your opinions in the form of short quotations, along with those of other interviewees, to support and illustrate the project results. Nevertheless, your personal information will be kept strictly confidential. The quotations will be anonymised, unless you wish to be identified and authorise us to do so.

Questions or further information

Should you have any questions about the research or the interview, please contact Ariana Escalante at naek502@york.ac.uk

ANNEX C

Interview Consent Form

(To be read in Spanish)

Research project

The rise of the wind farms: the good, the bad and the ugly

Please tick the boxes below as appropriate

1. I confirm that I have read and understood the information sheet for the above study
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason
3. I agree to take part in the above study
4. I understand that the information I share will be used in

   future research and academic publications

1. I agree to the use of anonymised quotes in publications

1. I agree to the interview being audio recorded

1. I do not want to be recorded but I am happy to proceed with the interview without an audio recording

1. I understand that data will be stored securely at the University of York.

_____	_____	_____
Name of Participant	Date	Signature
_Ariana Escalante Kantun__	_____	_____
Name of Researcher	Date	Signature