Transcript CCC1

Interviewer (Ir): So this is interview [redacted]. So maybe if you could just repeat, my first question is just about your job role and the company you work for and stuff.

Interviewee (Ie): Sure, so I work for a company called [redacted] and we are an energy efficiency consulting practice that administers energy efficiency programs for utilities, primarily electric utilities. And I run the data centre incentive program for [redacted].

Ir: Yeah, OK. So you work with presumably a wide variety of data centres, co-location, enterprise as well?

Ie: Yeah.

Ir: OK. And you… do you have much dealings with them in terms of working with them on their energy efficiency, presumably in respect of the efficiency of the power distribution, but in other respects as well?

Ie: I would say that my work is primarily based on the mechanical systems. And that has to do with the cost effectiveness of interventions. Interventions in power distribution tend to not be very cost effective. So they tend to not be as applicable for incentives. So mechanical is almost exclusively what I do. I’ve got expertise in IT as well, but it doesn’t come up that much.

Ir: OK, that’s good that gives me an idea of kind of where you’re coming from and stuff. Generally when I’ve been doing these interviews a lot of it has been based around the EU Code of Conduct for Data Centres, I don’t know how familiar…

Ie: I am familiar with it yeah, I’m not familiar with the particulars of it, but I recall when it was being created.

Ir: OK. So I understand that… or at least they try to purport the code as being something which is known not only within the EU but is maybe used as a code of best practice more broadly, globally as well, to some extent…

Ie: Certainly not in the United States.

Ir: OK. So you’re not familiar enough with the code to say whether you think it’s a good set of best practices or anything like that? OK, that’s fine.

Ie: No the only thing I can say is I have encountered some of the people that were responsible for putting it together and they seem like competent people! [laughs] That’s all I can say!

Ir: OK! That’s fine! Is there any… I’m not aware that there is, but is there any equivalent best practice type, voluntary system in the US, that applies to the US?

Ie: So, yes but they’re not holistic in nature, like the code of conduct is. What you will have is you will have energy codes that the primary drivers will be energy codes which will be relevant almost exclusively to the mechanical systems. And usually those codes only come into play, and a code is like a policy, they come into play when you are doing either new construction, you’re building a new data centre, you’re fitting out a data centre space, or you’re doing a major transformation. And in some cases, well in all cases those codes will also apply to the manufacturer of pieces of equipment.

Ir: So the Energy Star type approach?

Ie: Energy Star is a secondary thing. Energy Star is a voluntary labelling program that identifies the top 25% in terms of energy performance, however that’s been defined. So that’s what Energy Star is, and that’s totally voluntary.

Ir: So the things you’re talking about are standards that you have to meet in terms of the efficiency of plant and things like that, is that what you’re talking about?

Ie: Yes, so they will set minimum efficiencies around components so let’s say a chiller, or a motor. Or in [redacted] you’ve got one of the strictest energy codes in the United States. They go so far as prescribing things like aisle containment. Although it’s very poorly defined, and there’s a lot of loopholes, there’s a lot of ways to get around implementing it. But for new data centres, generally speaking you pretty much have to do aisle containment. Once you’re over a certain size you have to use some form of economisation, as an example. There’s a minimum coefficient of performance on your mechanical systems that has to be met. But there’s also standards on the manufacturer side which compel manufacturers to only produce equipment to a minimum standard. Energy Star’s a different thing, maybe that’s the best example of voluntary best practice, because there is the Energy Star data centre… you can qualify your data centre as Energy Star, and you can also qualify it as LEED, are you familiar with LEED?

Ir: Yeah I’m just trying to…

Ie: Leadership in Energy Efficient Design. It’s primarily non-energy related though.

Ir: OK.

Ie: LEED’s a global standard that’s administered by an organisation called the US GBC, Green Building Council. And you can have a LEED data centre, but energy’s actually a very small part of that, it’s usually other sustainable aspects of construction. Even things like have a green roof, or having bike racks, you get points for. And those are really only relevant to new data centres. Some data centres will go and get and Energy Star, but you usually only see that for government, or organisations that want to contract with government might get Energy Star rated. That’s the motivator. So your generic co-lo was doing things like that maybe 5 years ago but no longer do it. We won’t see them have current Energy Star ratings.

Ir: OK, and why is that?

Ie: The culture has shifted away, attention has shifted away from energy efficiency. At least in California it has, and I would say generally.

Ir: And why do you think that is?

Ie: I question that every day. I think you have different pressures that come up in data centres as an industry. The primary pressures that is gathering all the attention of designers and operators and managers and investors are a couple of things: there is outsourcing, so co-location, moving workloads and new capabilities and old capabilities to the cloud architecture. There’s a transformation that’s happening in the industry that is absorbing most people’s attention. First of all they were trying to determine how much co-location they need to do, and what they need to put into the cloud, and they’re assuming that everything is gonna go there. So they don’t wanna do a whole lot of maintenance of their existing stuff. They don’t wanna optimise their existing gear thinking that they’re thinking that they may not even have it any more. There was a lot of consolidation of facilities that happened a few years ago that’s primarily… the people that have done it are the ones that were going to do it. Everybody else is piecemealing things out to the cloud. So that’s where a lot of the attention has gone. And that’s been sort of an anodyne… the industry has stopped paying so much attention to the energy efficiency of their facilities I think for that reason. There’s also been things like IPv6 which has also absorbed a lot of attention. Just even… there’s a lot of things surrounding the network, you know, 10 GB networks and beyond I think is absorbing a lot of attention as well. And security. And that’s where everybody’s attentions are right now.

Ir: OK. Do you think these stipulations that you talked about in terms of aisle containment, and the efficiency of your plant and stuff, have they been effective in improving efficiency in data centres? You said there were some loopholes and stuff?

Ie: There’s plenty of loopholes, and my area of specialty doesn’t get me into a lot of new facilities. In [redacted] there are not a lot of new facilities being built. Most of the new facilities are being built in [redacted], which have much cheaper power rates. And so a lot of co-location is springing up over there. So a lot of the load, the big load is all moved out of [redacted]. So I don’t get to see it enforced that much. Because you have not a lot of activity in the existing facilities, and you have almost no building happening. So I can’t tell you how effective it is. Now it’s enforced up in [redacted], I think the consensus generally is that they’re doing pretty good work there as far as efficiency… it seems to be making a difference there.

Ir: I mean presumably…. One of the criticisms of the EU Code of Conduct is a lot of people seem to think it’s a good set of best practices but it’s not enforced, and also it’s not well promoted, some people say. But obviously if you have something that you have to do, it has that advantage…

Ie: Yeah, I think my reaction to that statement is, firstly I immediately think about co-location, and in co-location everything is, well in a well-managed facility everything is about the SLA. And it doesn’t matter how you get there. But getting… effectively delivering your SLA so your customers can’t sue you, is the end game, is the entire point. And then really good facilities will try to use the least amount of money to achieve that. Others will not understand what that even means. [Laughs]. So therefore, best practices were briefly I think marketed by leading co-location companies as a way to distinguish them from other competitors, and they would use Energy Star, and they would primarily use PUE as a way to describe that they were following best practices. But there’s a lot of the industry just hasn’t really picked it up. It’s just not part of their business really. Because they’re just so focused on their SLA, which is just delivering a temperature to… some location, that’s usually not defined [laughs]. It’s a certain amount of power uptime, it’s usually, you know, four or five 9s of uptime, and it’s a temperature somewhere in space!

Ir: OK. You mentioned that a lot of the regulations that do exist are centred around the mechanical side…

Ie: The electrical distribution as well, but it’s less so on efficiency, there’s almost nothing on efficiency for electrical distribution.

Ir: Yeah. Do you think there’s a need then for a more holistic approach?

Ie: On the manufacturing side, it would be wonderful. There has been competitive pressure has caused the manufacturers to promote more energy efficient architectures and UPSs. But you haven’t seen an awful lot of pressure making the overall power delivery chain efficient. So you’ll see, there’s been a lot of improvements in efficiency of UPSs and availability of UPSs, and topologies that are more efficient at lower loads, which is more realistic, it’s what’s seen in practice. So I don’t know if the UPSs themselves… if intervention is necessary there, but other elements in the power distribution chain are virtually untouched. So there’s an opportunity there.

Ir: OK. There’s another thing that the EU Code of Conduct tries to do is less technical things, but it has things like ensuring that there’s good communication between different teams within the data centre, so making sure that IT talks to mechanical and this kind of thing. Do you think there’s much scope for that kind of approach having an impact?

Ie: It would certainly never fly in the United States. It would never get passed, it would never happen.

Ir: What makes you say that?

Ie: It’s sort of not stern enough. Anything that gets passed will be very technical in nature. That’s gonna be a policy.

Ir: OK. Another policy approach that we have in the UK at least is… well it takes a little bit of describing, but we have this energy tax essentially called the Carbon Reduction Commitment, which is just a levy on electricity consumption for big electricity users. But the data centre sector has recently been included in an exemption from this tax called the Climate Change Agreement, whereby you have to commit to achieving a certain reduction in your PUE in order to be exempted from this energy tax. Do you have an opinion on whether either of those approaches could be useful in reducing energy consumption in the data centre industry? Either just directly taxing energy, would that be a driver, or offering a way out of being taxed on your energy?

Ie: I think it’s a great idea to allow for that exemption. How well defined is it, as far as PUE…?

Ir: Erm, I’m not sure to be honest what the accounting system is…

Ie: Do you know what the percentage of the levy is?

Ir: Err, it’s changed a couple of times, I think it was something like a 15% levy on electricity, it’s quite…

Ie: yeah that’s good…

Ir: Yeah, and then I think you still have to pay part of the levy, but you get like a 90% reduction if you meet this target.

Ie: Yeah, if I was to design it I would make it so that you could get it eliminated, but it would be, maybe you would have to pay somebody accredited to prove that you’ve hit your performance target. But that’s great, I think that’s a great structure. How has it been received?

Ir: Well, I think quite well in the sense that previously data centres were being hit with this tax, and now there’s a way out for them, so I think generally well. It’s only in its infancy, so I think things like, PUE is not a perfect measure obviously so there’s some concern that some data centres will find it more difficult. Depending on your kind of business model and things. And also…

Ie: It can be gamed very easily, just by increasing the IT load.

Ir: Yeah, so there’s those kind of concerns, but generally I think the feeling is that it’s the right kind of approach, or it has some potential.

Ie: So the Green Grid has just published a data centre performance indicator, which I don’t know if you’re familiar with, which is a more holistic look which allows for a 3-parameter data centre performance rating. And PUE is one of those 3. Another one is actually resiliency, and the third one is… I can’t remember!

Ir: Something on the IT efficiency?

Ie: No… it was just released. The gentleman that spearheaded that project, his name is [redacted].

Ie: Sure. From my point of view, smaller operators would find a more sophisticated approach even more of a burden.

Ir: In terms of actually…

Ie: …achieving it. They probably do not have the resources to think holistically about their data centre, and they probably just want to meet the standard so they can reduce their levy. And the fastest way to get there is the right way! [Laughs]

Ir: OK. So there’s nothing, there’s no kind of energy taxes that apply to the data centre industry in the US?

Ie: No there isn’t but when you first brought this up it occurred to me that it’s a little similar to the way that programs like the one I run are funded.

Ir: OK.

Ie: They’re funded by what’s called a public purpose charge. Not all the utilities have this, it’s usually something that’s enacted by a state legislature. And public purpose charges tied to what’s called a rate case. Which is the structure of how a utility, a regulated utility will come about an agreed on rate for electricity. So a lot of things that go behind that, and including calculating generation, transmission and distribution costs, and load forecasting. There’s a lot of things that go into it, and energy efficiency in some jurisdictions is a part of that as well. And they will have energy efficiency programs as part of that rate case. And what they will do is they will say that the utility will have to kick down, usually around 3% of their gross revenue to fund energy efficiency incentive programs, that will be regulated usually by a state body. The way the utility handles that is that they pass that charge to the customers, and it’ll be a line at the bottom of the bill. Similar to the levy actually, but it’s 3%, so it’s small enough that people generally don’t know about it. And some people do, the really big users that will actually have an energy manager will see it, and they will be very intent on recovering as much of that money as they can. And that money is recovered through participation in the incentive programs.

Ir: OK.

Ie: Some states have a way for large users to opt out of those programs, they don’t have to pay that fund. Therefore they don’t do any energy efficiency! [Laughs]

Ir: There’s always loopholes isn’t there!

Ie: That’s a huge one. [redacted] not like that. [redacted] you can’t opt out of it, but they’ve got other problems. In [redacted] you’ve got that really strict energy code, and the way that it’s interpreted greatly diminishes the impact utility energy efficiency programs can have because the baseline is assumed to be code. Even if you’re dealing with a retrofit, you have an old facility and old equipment, upgraded with new energy efficient equipment, even if it’s the top of the line, the utilities only will count the efficiency savings from above code performance. The code is strict enough that it’s very hard to reach that, and it’s making programs like mine almost impossible to operate.

Ir: Yeah. And presumably, potentially that’s another driver for people moving their data centre operations elsewhere really isn’t it?

Ie: Yeah, to do as little as possible but keep what they have going. And to locate any new facilities out of state, yeah that is certainly what happens.

Ir: And it also prevents you from wanting to retrofit what you have got, if you can’t retrofit it up to the standard you need to.

Ie: Yeah if you want an incentive, it has to be above code. It has to be something that the utility commission agrees is not industry standard practice and it makes it very very difficult.

Ir: Yeah. I was also gonna ask about, I don’t know if you have these in [redacted], if you think approaches like subsidised energy audits and subsidised design services and things like this are…

Ie: I know all about this.

Ir: Yeah, do you think those kind of approaches can be helpful in data centres?

Ie: The opportunity for what is called free ridership in those programs is very high. The organisations that will use something like that will probably pay for it on their own. That said, in my experience, it’s very hard to get a program off the ground without free audits. Free audits and some level of engineering support on the energy calculations is… it really makes a difference in terms of how much participation you get. But that said, the companies that are gonna deliver the most benefit to the community, in other words have the biggest energy saving potential, the ones that are gonna do those projects at all, do not need free services. The free services help draw attention to the program. That’s the main function. So if you calculate the cost effectiveness of your services from that point of view, then yes, it’s effective, extremely effective. But if you look at it in terms of free ridership it’s usually not. So hopefully that answers your question.

Ir: Yeah.

Ie: Cos I’ve worked for utility programs where you have both, where you have… the rate payer has to pay for their own engineering, to apply for an incentive, and that engineering is energy analysis, and it’s a big inhibitor if they have to pay for it, because it is an additional cost, and you have to explain that they get that back if they get the incentive but there’s uncertainty if it’s gonna qualify, and if they have to put that money upfront, you really have to twist their arm, or they have to be really motivated to do it already. And if they’re really motivated to do it already they never needed it at all.

Ir: OK. I mean it must affect companies of different sizes to different degrees as well, because if you’ve got a big company that’s got the engineering expertise in house, they don’t need it as much, but maybe it’s more useful for smaller operations I suppose.

Ie: Absolutely. It’s expensive though as well, and utilities don’t like offering it unless they… they often see it as a customer service, customer relationship benefit, it’s almost a marketing expense.

Ir: OK. Er, I think that pretty much covers everything I wanted to ask you about.

Ie: Cool.

Ir: Unless there’s anything else that’s sprung up that…

[redacted]