Inside Data Centre Podcast.

WITH ANDY DAVIS

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Title

Michael Crabb, SVP Commercial at Last Energy: Can Nuclear Energy Solve the Power Challenge?

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Transcript

This is the Inside Data Centre Podcast. We talk to the people who power the data centre sector to give you insider info on everything happening in DC. Here's your host, Andy Davis.

Andy Davis 0:29

Welcome to the Inside Data Centre podcast. Today I'm joined by Michael Crabb, SVP of Commercial at Last Energy. Good morning, Michael.

Michael Crabb 0:36

Morning. Thanks for having me on.

Andy Davis 0:38

Pleasure. It's going to be an interesting conversation this one because power is probably the most talked about topic in the industry, right now, it comes up on probably every single podcast that I record. So it's going to be interesting to talk to someone on the other side of the industry, really, that's coming at the power challenge with a solution. So looking forward to hearing your views on how we can manage that ongoing problem. Before we go into that, do you want to give everyone a quick introduction of who you are and what your role is at Last Energy?

Michael Crabb 1:10

Yeah, sure. So I have 15 years of energy markets experience mostly in power and a little bit of midstream gas, on both the investor side, the operator side and the project development side. My team at Last Energy oversees our power purchase agreement, origination, project development and project financing. We are what the power industry likes to call "energy as a service", which is clearly a take on software as a service, so we're borrowing from the digital infra space, where we are a full suite developer and operator of our energy solution, and then we sell power to customers, such as data centres, who, as you said, are constrained by power supply. So that's us in a nutshell.

Andy Davis 1:59

Definitely, we'll go into a bit more detail on that. You touched on it briefly there that your background is from other sectors in relation to power. And, again, a big point that I've tried to make on a lot of podcasts is our need to look for experience in other areas and not just take the people from the data centre sector and move them around the industry, which is what we've historically done. So I'm just interested really to kind of how your career led you towards data centres, and also how you found it since you came into this industry. Because, again, the perception is not always the reality of the world of data centres.

Michael Crabb 2:35

Interesting. So yeah, I started my career in private equity, and we were investing in power assets in the United States. So I looked at all sorts of generating technologies. Our core expertise at the time was natural gas fired power plants. So we built a couple of portfolios of gas fired power plants, and then financed them a few times and then sold them to other companies. I then spent some time doing project development and operations of power assets. So again, neither of these things are data centre oriented, but I'll close the loop on the backside. And so but that decade of energy markets experience sort of led me to nuclear as a as a solution to what's been an evolving problem over the last handful of years. Right, which is an increase in energy demand. I think over the last decade or two, we've had stagnant demand in the United States, a lot of that due to energy efficiency measures, and a lot of it due to offshoring. Right. So we're moving our manufacturing overseas, we're not we're growing on the back of foreign imports. And that's all starting to change with the data centre space and with reshoring, right, with with the investment or Inflation Reduction Act and some of those things. So anyway, so that's sort of my history, and then coming into nuclear. And then data centres are sort of two leaps that someone might say, "Oh, well, that seems very different". But it isn't really right. Like project development is project development, you need to find siting, you need to submit permits, you need to figure out electric connections, right. On the power side, we've got to connect to the grid. And we do complain that it takes too long data centres there on the demand side, they have to connect to the grid, they complain, it takes too long, right. And you go through a permitting process usually has some public disclosure requirements, right? It has some technical requirements. And then you need to package that business case and raise funding for it. And so the data centre industry is actually very analogous to power infrastructure and energy infrastructure development broadly. It's just a question of what that energy conversion machine or widget actually is right. So when I started natural gas, I was converting mmBTUs into megawatt hours now. Now I convert mmBTUs at a rock into megawatt hours, right. And the data centre space takes says megawatt hours and convert them into megabytes. Right?

Andy Davis 5:05

I see it, exactly it. Power is power, I guess for the putting it down to the layman level for anyone listening is, you know, you're a power solution is the challenge you're trying to solve and whatever that may be. And obviously, Last Energy, you touched on it briefly in the overview of, of your role and your introduction. But do you want to give a bit more insight into what your solution is? And then we can discuss how that reacts to the data centre industry?

Michael Crabb 5:37

Yeah, of course. And I'll maybe answer that two ways. I think our core solution is the business model. And then we have an underlying product that enables that. So that solution of a business model isn't something new. In fact, the data centre space, and some of the big box retail stores really drove this idea of a corporate power purchase agreement, right? Where they said, you know, an electron isn't an electron, right, there's a value to having renewable or sustainable electrons. And so you know, me the energy, or they the energy buyer, you know, is gonna say, "Hey, I'm gonna leverage my purchasing power to influence this commodity market". And so they've started building over the last, you know, 10-15 years a real marketplace for power purchase agreements, where someone will build a power plant, and a, a customer, a company, will buy power on $1 per megawatt hour basis, or euro per megawatt hour or pound per megawatt hour basis. It differs from your utility connection, which is you say, "I'm going to connect to the utility, I can take up to this much power, and the utility is just going to build me monthly, whatever the price of power is, that month, that's the price I get". And so there was quite a bit of surprise, I think, with some of our customers over the last year or two with price volatility, right? You get lulled into this false sense of security. And it's like, well, it's not that way, right, the price can move

all over the place. And there's other non-commodity charges associated with that as well. So the power purchase agreement says, OK, we're going to fix that price for you, right, there's some financial structuring that allows you to go from a floating power price to a fixed power price, or some other structure as you deem appropriate for your risk management and procurement needs. And so the Last Energy solution is that exact business model on the provider side, we say, "Hey, we've got, we've got an underlying product that we'll talk about in a minute that provides a round the clock baseload carbon free power, and we'll sell that to people that need around the clock, baseload carbon free power", and generally it's four term, so 10 to 25 years, depending on our specific customer sets, the data centre space tends to be 15 to 20, generally matching up with their lease terms. So that's the that's the product that we're selling to the data centre space, the underlying technology, right? Well, we will call our widget is a 20 megawatt pressurized water reactor, nuclear power plant called a micro nuclear power plant. And they are completely self-contained. So we will deploy in 20 megawatts the same way you think about your diesel gensets, right, that if you need 100, we'll put five. And for the data centre space, maybe we'll put six, right if you want n +1. And you're right, and, and are we talking about your max, you know, your MVA connection, are we talking about your actual it load. So we work those things out together with our customers that need that power. But that's the underlying product. And then the innovation that we brought to the space on the construction side, is to make the entire power plant completely modular. And again, this is a bit of a technique that we borrowed or stole from the data centre space, right, that the entire power plant is delivered in 12 by 12, by 48, steel frame modules. And we've built a number of these modules now two in Texas and one in Poland, to demonstrate and to both qualify our supply chain and to demonstrate the modularity and work through the fit ups of those modules. So we're really excited about, you know, advancing our portfolio into commercial operation.

Andy Davis 9:20

Now, from a modular perspective, I also guess that gives you the ability to take it wherever it's needed, because again, a lot of the challenges around the data centre industry are geography, where these facilities are, and that is obviously impacts from a power availability, but also, just getting supplies to these locations can be quite challenging. So the modular aspect ticks that box as well.

Michael Crabb 9:43

Yeah, and um, and maybe I'll, maybe I'll just make a clarification on that too. Because there's some people they say modular and they really mean mobile. Our power plant isn't really isn't really mobile. So the modularity for us is a schedule benefit, right? Where data centres say go, they need to go? Right? Like the tenants of your data centre, they need the power. They're planning on that compu they're doing billions of dollars a quarter of new development, right? They need that ASAP. And so the modularity for us really minimizes schedule and schedule risk. That is the clear piece for us. The location aspect of it is sort of a fundamental truth of nuclear itself. One of the reasons why nuclear is such a great solution, because it really doesn't require local input. You know, so I've done solar, I've done wind, I've done natural gas, I've looked at biomass development, right, all of those require some sort of feedstock. And even on the renewable side, people say, oh, there's no fuel. Well, there's a lot of work on a siting perspective around what your solar resources, what your wind resource is, what sort of shadows are there going to be or wake effects, right, obviously, on the gas biomass side, it's all about what your feedstock story is. And that really starts constraining, where you can place a product, you know, you're generating technology, for nuclear, because it's so energy dense, we only have to refuel it once every six years. And so it's this very small amount of fuel that is completely self-contained. And then the one little innovation that we've done, or the design choice that we've made is to have what we call air cooling. So the cold side of the steam turbine, we use fin fan heat exchangers. So these are basically fans on the roof that create the cooling to suck heat through the steam turbine. Again, not a new invention, but it does take away that large cooling tower that people associate with nuclear sort of unfairly, it's just a function of any thermal power plant. And so that's a number of added benefits for us.

Andy Davis 12:02

Yeah, definitely. And how's it been received by the industry? Because, again, the data centre sector can be one of those sectors where it says it's open to new ideas, but it's actually not as receptive to new ideas as it likes to think it is. So how have your

conversations been going with the developers or the operators in the industry?

Michael Crabb 12:21

It is funny, I'll borrow a line from a colleague of mine in the space, he says "the data centre industry loves innovation, as long as it's 10 years old". I think they're, so two years ago, the data centre space was talking a lot about this, but when you actually sat down to put pen to paper, all of a sudden, it was like, "Ooh, I don't know, well, I'm super busy. You know, maybe", I think the last six to 12 months, as people have gotten their connection, great connections, pushed back, or cancelled, or, you know, the hyper scalars are starting to talk about time matching power, right, you know, all this sort of rec nonsense, is starting to sort of be exposed. And then you add on the growth opportunity around artificial intelligence, I don't know if all of the hype is real. But the just the per rack, like the kilowatt per rack here is an order of magnitude larger, right. So even if half the hype is true, you know, the data centre space will be a top 10 energy consumer out of the countries in the world, right. And so I think those three things have driven an enormous push to find real solutions. So we've signed a number of term sheets, even over the last few months, with data centre customers to build both virtual PPAs where we connect to the grid, and we sell over the grid as well as private wire PPAs, where we're establishing development opportunities together and connecting into one common substation.

Andy Davis 14:06

Interesting, and from a scalability perspective, as well, because this is another question that comes up when you talk about new power solutions. The sceptics out there, I guess, so yeah, but is it scalable? You know, how, how big can this go as a, as a demand for power increases, as you say, due to rack density and sheer scale of some of these facilities? Not all of them, because there will always be the, you know, the smaller or the micro and the edge facilities as well? How scalable is it from, I guess from a cost perspective, as well as from a scalability perspective?

Michael Crabb 14:40

Maybe I'll answer those backwards. I mean, the beauty of having the same product, the same energy generating station every time, right, we're building a 20 megawatt power station. It doesn't have local resource constraints, right. So it's literally the same thing every time and if you want 200 megawatts we'll build 10 of them. It is it is, in that sense, technically infinitely scalable, right? People get very uncomfortable with that just because of their bias around what like a nuclear power plant is, but you don't build one giant solar panel or one giant wind farm, right? In fact, the ability to do the same thing more, you know, many, many, many, many times is what unlocks the first part of your comment, right, which is that scalability when it comes to delivery and financing, and so it's actually a key, even though it's like uncommon for people to think about it that way. It is a key reason why we think it's both economic today, right? And it becomes even more economic moving forward into the future, because we will do it not once, not 10 times, but hundreds of times, 1000s of times, and it will get better, right? That's more law, it will get better every single time we'll get faster and more efficient every single time and will access cheaper capital over and over time. And that playbook was done first with first with coal, then with natural gas and wind, like we we've seen this play out before.

Andy Davis 16:09

It's definitely that I know, sometimes, obviously, the questions are deliberate to draw out the answer that you believe but is that I think it brings me on to my next question, because I think people are just quite siloed in opinions, and perception. And they don't always fully understand what the solution is. They just see that giant nuclear power station that we all see in the media, when well, in the UK, they're building a couple at the moment. It's what we see all the time. But and I guess perception is one of the challenges, isn't it for nuclear power, or nuclear energy, because it's similar to the data, the data centre industry has a huge problem of perception as well, which is why I started this podcast in the first place. But then when you link in nuclear as well, you have this challenge of, we don't really want you building a data centre in our backyard, and we definitely don't want it powered by nuclear. But all of that is a lack of understanding. So how can we overcome that from a nuclear energy perspective?

Michael Crabb 17:08

Yeah, I so I have a very different lens on that problem. I so you know, I've done liquefied natural gas, wind, solar, and a little bit of biomass development in my time. And nobody likes any of those really, right? Like, like people just, it's just basic human tribalism, that if you are going to build even like a three storey apartment, someone is going to oppose you. So if we start as that as the baseline, I don't actually believe it's about an understanding. I don't think anyone has ever gone to a town hall wanting to learn, people go to town halls, mostly to complain, right? Like, like even people that are supportive, they're probably not going to the town hall and taking time off work, right. So the people that are going are self-selecting, to complain about something, I think, rather than approach that development is like, we need to educate people. They just, they just don't understand and which has an undertone of like, "I know more than you". We actually have to go to those, those town halls just to listen, just to hear people. And so, you know, we don't we don't try to like educate people on nuclear and say, Hey, here's, here's like, you don't talk about millirems and millisieverts, and all these like technical topics, we say, "hey, what's important in your life?" Right? You need more school, or you want to better hospital access, or you need more jobs, like what is what does the community actually want? And that's, that's really what people want to hear when you're talking about a development perspective. So that's the hyper local answer to your question. I, I actually, the way the questions usually framed to me around nuclear perception is other people don't like it. I've very rarely in any room that someone say, hey, I really don't like it. And usually, I surprise people I say, I agree with most nuclear sceptics, or people that would call themselves anti-nuclear, because they generally, they've generally looked at the tech technology and have no problems with it. They complain about cost and schedule, to which I say absolutely agree. Right, it does not make sense to use 20 billion taxpayer dollars to build a plant over 20 years. And I can't believe how like the industry doesn't even acknowledge how crazy that is. Right? Like that's, that's just crazy. It's horrible. And so for the most part, when we're coming in, we're saying, Hey, we're a private developer. We're going to own and operate this facility. We're going to supply power to your community to power jobs, the power industry, and oh, by the way, it looks nice, right? It's only three storeys tall. It's got a nice sod on it. There's no cooling tower. We're not impacting your watershed. Like, all of a sudden people like "Oh, that's pretty interesting, right? You mean I don't have to look at a field have solar panels? Like, that's pretty cool". And so, yeah, I think I think that the key aspects around cost and schedule are the preset perception problems and are the real problems. And that is what we were like we've been building our business to solve.

Andy Davis 20:17

Yeah, I totally agree with you on the community piece as well. I think the engagement of the community is how you manage all of the challenges, whatever they are, because it is, as you say, it's a local challenge. And you need to deal with that specific challenge, not a whole industry, perception. And from a last energy perspective, obviously, you have a lot happening at the moment. I know you're very busy, you've got a lot of a lot of different things on the go right now. But what what's next, what does the future look like for you over the next year or two?

Michael Crabb 20:48

I mean, we've, holy smokes, we've built a really robust pipeline of projects across our target European geographies. And so we've locked up some site control and are negotiating others, and starting to prepare some of our initial filings or we're in some of the processes around permitting and licensing. So it's sort of the basic, again, it's, you know, same process, maybe different regulator or different words, but it's the same process around what's your environmental impact? What's your technology look like? What are your specs, all that kind of stuff. In parallel, we're starting to execute some of our supply agreements, and are even starting to think about when to put down deposits on long lead time equipment. Remember, the beauty of having the same thing every time across that pipeline of 10 or 12 projects, I'm not even sure which is going to be first. But I know the product looks the same in each place. So we can start putting some deposits down on equipment that takes time to fabricate and that kind of stuff. So that's the next 12 months. And then we'll be working on everything going according to plan. We working on site prep and starting to commission, our first unit on the back half of that second year.

Andy Davis 22:06

On the geography point, you touched on it briefly though, where is it you're targeting, obviously, your us today, the main regions of focus?

Michael Crabb 22:14

Yeah, we're, so we're headquartered here in the US. But our pipeline is across the United Kingdom, Netherlands, Poland and Romania. So to Western to Eastern European countries, where there are real constraints around power supply and real power price challenges. Here in the US. There's some local challenges around power, but we still have very cheap natural gas. So it's not as competitive a market for us.

Andy Davis 22:43

Yeah, I think in the UK at the moment, it was yesterday or today, there's a news article from the chief CEO of the power, government power, basically saying how data centres are such a big problem with regards to the power consumption in the coming years. So you know, you're correct, obviously, as you know, these regions, and there are other regions are experiencing a real crunch right now. But they're also now starting to realize what's coming, which is the big problem.

Michael Crabb 23:11

Yeah the UK is particularly I don't know if funny is the right word, data centres are like 3% of their power consumption. Right, because it's not a huge country. It's not, it doesn't have a lot of industry. But the other side of that equation is it's a huge service-based economy, right? If you think about London, and the data requirements and the latency requirements of having this financial institutional hub, but you can't just say, oh, I'll just put that data centre, you know, in mainland Europe. So yeah, not only is it a huge demand segment today, but you have to increase it, because it's the backbone of the rest of your entire economy. But you better figure out a way to power it, because otherwise, you're just going to be spinning your wheels. So it's a really interesting, I don't know how many people have really tied all those dots together. But I think some of the top level politicians certainly have and they're really struggling to find a solution.

Andy Davis 24:10

Yeah definitely. We could talk about that for quite a while because obviously, it's a region that where I am, but you also see the data centres move away from the hubs, which obviously gives the flexibility for solutions such as what we're talking about today. But we'll do that another day. When, when you're active in the UK, we can we can look at that again. A couple more questions I just like to get your input on really, it's interesting to hear from people that have come into the sector to see what they what their views are of the industry. So we touched on quite a lot of challenges around power, which obviously is probably as the same, you know, it's in the top two or three, whoever you talk to that. Are there any key challenges you think the sector faces across the rest of 2024?

Michael Crabb 24:56

I don't know if I'm a good expert to ask around anything other than power, frankly, I could certainly see supply chain constraints becoming a problem if, if the demand the expected demand starts to materialize. I also think there's a real risk, probably not over the next nine months. But maybe over the next two or three years of having a financial bubble sort of come, you know, start to show around the development platform valuations, right, that you're getting a lot of infrastructure money flowing into the space with really big eyes. And it's still a development process, right? You can only accelerating so much. And so they're, they're, you know, similar to maybe what we've seen solar, solar development platforms over the last four years, they were the Darling and now they've started to sort of like, oh, boy, that pipeline is not materializing. I could see that same risk happening in the digital infrastructure space as well. I think the other assets, one of the things that I hear a lot from the data centre space, this idea about

young talent, and sort of like how to attract people and all that kind of stuff. And we talk about that a lot in the nuclear industry as well. I sort of generally feel like that's a made up concern, like, where there is growth where there is opportunity, people will flow to and it's not like it is such a technical aspect, right. It's like legal, contractual structures. project development is a real estate business, right? Like, I think, general contractors, right. That's any sort of construction electrical trade technicians. Like maybe that's the core challenge, but people will flow to where there is opportunity and where there is capital. So I think that is maybe a little bit overblown.

Andy Davis 26:44

Yeah, it's an interesting point on the young people, I think the biggest problem the sector had or has, and it probably is similar to nuclear, for my knowledge of that industry is we make it more sound more complicated than it actually is, which then puts young people off from looking at it. It's not that they're not there. It's just they're choosing to go somewhere else. And that's the same opinion that you have.

Michael Crabb 27:07

And it's a little bit of an approach. It's a little bit of a, like an approach mentality. I think a lot of times I observe this in the nuclear space as well. People say, "oh, I want to attract people to the space", but they don't want to give them responsibility. Right? They don't actually want to give them like real opportunity. They want to like push off, they're busy work on people. Right? And yeah, no one wants to do that doesn't matter. Like you can't like put that we say lipstick on a pig. I don't know, if that's a UK expression. You can't make that look attractive, right? Yes, when you start out, you do a lot of groundwork, but you have to give people the path. And you'd have to be willing to, like bring people into meetings and let them sort of take ownership and let them make some mistakes, right. And you can do that in a way that's not business critical, right? Every industry figures that out. And I think when you really give those people an opportunity, like there are some absolute rockstar young people that are just generalists, and they're hungry to learn, and they work really hard. And we've got a whole team of young people that are just knocking it out of the park, because we've given them a little bit of training just enough to be dangerous, and then you point and shoot, and they'll just hustle and make things happen. So yeah, I think it's I think it's a mentality, not a "Oh, woe is us, we need all these new things" type of thing.

Andy Davis 28:22

Yeah, definitely another point that I could talk about all day. So we'll end it there. But I'm on your side, I agree with you. Two more questions before we close up. If you could ask everyone in the sector to start or stop doing one thing, what would it be?

Michael Crabb 28:39

Start or stop doing one thing? Mmm, hmm. I mean, mine would be pretty tactical, right? I think it's this idea of you need power solutions, you need to place a lot of bets on your different power solutions. So like one thing I always say is like, like, we could do technical diligence on our product till the cows come home, right? Like, there's a lot of this, like, oh, I need to, you know, kick it over to the technical team to research and they're saying, "oh, yeah, we're spending the next 12 months researching different technologies". And like, What the hell are we doing with that? Right? Like, yeah, you should enter into power purchase agreements with geothermal and with nuclear and not just us, right, do other nuclear companies, and whatever weird storage solutions are out there at this point in time, right, like, like there are, there are 500 companies tackling the sort of distributed energy solution, I made that number up, maybe it's 1000. Around decarbonize energy solutions. And if we don't get off our butts, and start, like progressing real projects together, we're going to be having the same conversation a decade from now. And so I think that's the like, let's stop making it harder than it is. Let's let the data centre industry build data centres, let the energy space climate tech space build energy solutions. And not all of them will succeed the same way not all of your development projects succeed, right? That is the nature of the world that we live in. But we're not going to have any solutions or any growth if we can't kind of get off our butts and go do it. So we definitely have partners that take that mentality. So it's unfair to say the whole data centre space. But yeah, I think there's, it's lost some of that, like, hey, let's get off our butts and move fast and break things sort of mentality.

Andy Davis 30:33

Definitely. And a final question before we close up, you've given some great advice to employers looking to recruit people, which I think is give these young people an opportunity, which is a very, very good point, but how about some advice for people looking to join the sector. So if you could give one piece of advice to anyone looking to join the industry, what would it be?

Michael Crabb 30:52

Well maybe I'll make it a plug for us, right, we're always hiring and growing, I mean, if you're willing to work hard, and you might have to do a big of networking, reaching out to people but people are generally pretty open to having a conversation. Go to these conferences, you know as a student, and usually there's discounts, or you could just loiter around the event, and message a bunch of people on LinkedIn and they'll have coffee with you or a beer with you or whatever. It is kind of a walled-off ecosystem but you can get brought into that tent easily if you're personable and ask good questions and someone will give you a shot and its about grabbing that by the horns. You're gonna do grunt work, it happens, but finding someone who's willing to mentor you who can teach you some of what they know, there's so much growth in the space, both from our side (power supply) and on the data centre industry itself. You're not gonna have a problem but you're gonna have to work hard.

Andy Davis 32:00

Yeah definitely and the networking aspect of it is really important, and it's a good point to highlight. Thank you I really enjoyed that conversation, its interesting because a lot of my conversations do talk about power. I've talked to a few similar organisations about the solution and I think we're seeing more of it, its becoming more prominent and its definitely where the industry is going so thanks for your insight on what you guys are doing and also how the sector can develop over the next few years and hopefully manage the power challenge that we're facing now and is only going to increase.

Michael Crabb 32:35

Yeah, well hopefully it doesn't increase if we're successfully in some of our other. Andy thanks so much for having me on.

Andy Davis 32:42

Pleasure. And where can the listeners find out more about yourself and Last Energy.

Michael Crabb 32:47

Yeah of course so you can Google Last Energy (lastenergy.com is the website) you can find me and our team on LinkedIn as well and you know keep and eye out for project announcements and permitting processes to come soon.

Andy Davis 33:03

Excellent and we'll put the details in the show notes but thanks again for your time, enjoy the rest of your day and we'll catch up again.

Michael Crabb 33:09

Thanks so much Andy.