

ENERGY

BEYOND THE ELECTRON PODCAST

The Foundation of Our Distributed Energy Future

Moderator: If you've paid even a little bit of attention to the transformation of the energy industry over the past decade, you'll know that the biggest force for change has been the emergence of affordable, distributed energy resources, or DERs. Solar and battery storage are the most well known DERs, and dramatic price declines for both technologies has sparked significant and ongoing change in how electricity is generated and consumed. While the influx of DERs leads to important benefits like increased customer choice and reduced greenhouse gas emissions, fully capturing their potential requires something beyond simply widespread installations.

That something can be best understood with the concept of integrated distributed energy resources, otherwise known as IDER. IDER describes platforms that use software and advanced machine learning capabilities to do everything from aggregating resources to promoting customer choice and flexibility. Navigant Research estimates that IDER platforms could support the creation of as much as three trillion dollars in value over the next two to three decades. We're gonna take a closer look at the possibilities and different manifestations of IDER in this episode of Beyond the Electron: The Energy Cloud podcast series. I'm your host Chris Warren, and I'm pleased to be joined today by two people who spend a lot of time thinking about and actually pursuing the development of IDER platforms.

With us today are Ted Walker, a managing director at Navigant's utility consulting services. As a strategic advisor to energy companies, Ted has focused his attention on growth opportunities and the changing role of the utility in the evolving energy ecosystem. Also with us today is Raghu Sudhakara, a manager for the utility Con Edison in New York. Raghu has been on the front lines of Con Ed's work developing and implementing IDER business models in response to New York's aggressive Reforming the Energy Vision initiative. Thanks to both of you for joining us.

Ted Walker: Great, thanks for having me. This is an exciting and very timely topic.

Raghu Sudhakara: Thank you very much as well for having me. Looking forward to our conversation.

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About Navigant

Navigant Consulting, Inc. (NYSE: NCI) is a specialized, global professional services firm that helps clients take control of their future. Navigant's professionals apply deep industry knowledge, substantive technical expertise, and an enterprising approach to help clients build, manage, and/or protect their business interests. With a focus on markets and clients facing transformational change and significant regulatory or legal pressures, the firm primarily serves clients in the healthcare, energy, and financial services industries. Across a range of advisory, consulting, outsourcing, and technology/analytics services, Navigant's practitioners bring sharp insight that pinpoints opportunities and delivers powerful results. More information about Navigant can be found at navigant.com.

Moderator: As I mentioned in my intro, Navigant estimates that IDER platforms can generate up to three trillion dollars in value over the coming decades. I'm curious what both of you think about what needs to happen for that to take place, and what that will actually look like. Ted, you want to start us off?

Ted: Sure. First of all, underpinning that three trillion estimate in value is really the underlying growth of the DER market itself. So the market needs to continue to grow, and we take this as a given. A number of policy tailwinds have been put in place over the last couple years, including most recently with FERC's order 841 as well as state level support as we see in a number of states for shorter energy resources. So, we think the market will continue to grow but that is a key underpinning of that. The second thing is really given that utilities are at an ideal place in the value chain for integrated DER, they must act, and utilities can either take a passive or proactive approach on this. A passive approach is really to protect, let others lead, and deal with ramifications, but obviously the recommended approach would be a proactive approach that's really thinking about and developing a business model that optimizes these multi-way flows, as we talked about, and really thinking about value streams, engaging with customers, et cetera.

Moderator: Yeah, that's actually the perfect segue to Raghu. When you say utilities must act, Raghu is at a utility that is acting. So, maybe that can turn us to a discussion about what Con Ed is doing in terms of pursuing the development of IDER platforms. Can you give us an example of what the work you're doing looks like on the ground?

Raghu: Absolutely. I think this idea of IDER platforms, New York State I guess has been a leader in terms of integrating these distributed energy resources ever since the evolution of the policy, the REV policy, Reforming the Energy Vision that you alluded to in the introduction, and Con Edison actually has been a leader even prior to REV with our first non-wires alternative project, which we call the BQDM project, the Brooklyn Queens Demand Management program, in 2014. Ever since we've been experimenting and we've been innovating to see how we could find different ways to integrate distributed energy resources. A good example of that is the BQDM program like I said, where we put together a portfolio of \$200 million dollars of resources, nontraditional resources or customer side solutions, in order to defer a one billion dollar infrastructure project. So this is just one way where we started looking at integrating distributed energy resources, but really there's a lot more additional steps that I'm sure we'll talk about as we go forward in terms of accommodating these different energy flows and then building financial platforms to accommodate that.

Moderator: The Brooklyn example is really great, and I'm wondering how Con Ed has approached developing an overall vision for IDER and how IDER fits into the entire energy ecosystem. Can you talk a bit about that, Raghu?

Raghu: Yes, absolutely. Thank you for that question, Chris. I think the vision is clearly extremely important here, and maybe just want to talk about three trends that have been coming together recently. Customer expectations is the first big trend. I think when we speak of the value, we really think about the customer and how with the introduction of apps and smartphones, customer expectations have changed around every aspect of their life including their ability to manage energy and ability to install distributed energy resources. Coupled with that are technology changes and how advances in technology are bringing new energy products and services to our customers, and lastly it's the policy evolution to accommodate the above.

So really from a vision perspective I think for Con Ed, we put customers at the center of decision making. We want our customers to be able to install distributed energy resources and manage their energy use the way they want to do it, really where we see where we come with our tools, our expertise and our knowledge as a utility, is to be able to then integrate them to be able to allow the two way power flows on our system, to be able to give data that is useful to third parties and to our customers in a way that the distributed energy resources actually not only provide benefits to our customers and make their lives easier, but that also helps the grid and the system so there's more societal and benefits to all customers and not just the ones that are installing the distributed energy resources.

This is what started our drive in pursuit of non-wire solutions like the Brooklyn example we just talked about, and it's also allowing us to think about other tools, changes to rate structures for example that allow our customers to benefit themselves and benefit everybody else from the installation of more distributed energy resources.

Moderator: Raghu just described an interesting dynamic where the utility serves basically as a facilitator to help customers who are interested in corporate and DERs to help them do that, but also benefit those who don't, and Ted, I'm wondering from a big picture perspective, how similar or dissimilar is what Con Ed is doing to what you're observing around the country and around the world?

Ted: Sure, sure. We're seeing similar efforts but most utilities are further behind where Con Ed is, and few utilities have such a refined vision for IDER as Raghu laid out. One outlier though, when it comes to utilizing and embracing IDER, is Green Mountain Power. They are going head first in developing an IDER platform. They have a storage offering for residential. You can get a Tesla Powerwall for \$15 a month. Another example is the ConnectDER meter collar that streamlines the interconnection of residential solar, and the last offer I'd like to highlight is their off the grid offering, so that extends their virtual presence beyond the traditional boundaries of the grid and allowing customers that do not have access to the grid to have a virtual grid that's DER enabled.

Moderator: Great, yeah. Earlier we had talked with the CEO of Green Mountain Power, on the first episode of this podcast, and it was really interesting to get her perspective on facilitating DER with the customers in Vermont. So, let's talk a bit about technology. You've mentioned a number of technologies in your last answer. How important is it to remember that technology ultimately has to serve customer needs? Ted, why don't you take that first? And then we'll go to Raghu.

Ted: Sure, sure. Obviously being customer centric and thinking about IDER from a customer centric point of view is very important. Customers are really at the center of what's next for energy, this energy cloud transformation, and in a lot of cases customers can be in the drivers seat of that. When it comes to technology, we need to think about both customer facing technology, those technologies that the customers can use every day such as smart thermostats, EV charging points, smart home controller, smart home assistance, even smart devices out there. Those are important, but also the ones that support customers behind the scenes that they don't necessarily see, like smart meters, customer billing systems, the power grid itself. These, it's even more important to keep the growing set of customer needs both now and in the future at the forefront, and lots of players are providing these technology components and supporting platforms, and there are a number of integrations across platforms. Think of Amazon Echo, Google Home, et cetera, linking to many of those.

But really key here, and where IDER fills a gap, is that there's no player that's optimizing across all of these for solving those three multi-way flows of energy information and financial.

Moderator: Thanks, Ted. How about you, Raghu? Can you talk a little bit about making sure that technology is serving customer needs as you pursue your vision for DER?

Raghu: Absolutely, and I think I really like the way Ted laid out almost the two versions or flavors of technology, if you will. One is really the customer facing aspect of it, and one is really the back end, the technology tools that we're developing at the utility. Maybe I'll start with the tools of the utility first and then move to the customer side, and really here I think as you're seeing more and more distributed energy resources, we just have to integrate these resources through different technological tools. So whether it be around planning for utility infrastructure, whether it be around procurement say for example, for non-wired solutions or natural uptake of say new solar PV connections coming onto the grid, whether it be financial settlements for demand response-like program, or whether it be data management and analytics, so even as you're integrating all these resources you're still maintaining reliability and having an eye towards resiliency of the grid over the longer term as well. So, all these requires a lot of sophisticated technology, lots of tools. We're still in the very early stages of this type of technological adoption and advancement.

Raghu: In the long run, I think these tools will start getting more and more integrated, talking to each other, and perhaps realize that ultimate vision of a transactive platform several years from now. On the customer side, I think it's also extremely important that technology does not become a means for just being advanced technology, but actually serves customers to their benefit. I think we're seeing that with customers voting to choose one technology over the other, or using those technologies that actually provide them the most benefit and make their lives easier, but I think as a utility, we also want to always make our customers more aware of new technologies because customers have increasingly come to see us as their trusted energy advisor, as their partner in energy decisions. I think there's another role that I see here from an outreach and an awareness perspective.

Examples would be heat bombs, which are still nascent, at least in the Con Edison territory and where customers are learning more about it through our outreach strategies, and integrating them for their cooling and their heating needs. Electric vehicles is another example, so I think technology is gonna increasingly play a crucial role, but it's really our responsibility to adapt those that actually move the ball forward.

Moderator: That's great. Ted, I'd like to get you in on this a little bit. It's tempting to talk all about technology and the interesting things that are made possible by developments in technology, but as Raghu was mentioned there's a certain element of culture change, both within utilities and even among customers in terms of how they interact with utilities. Is there an optimal way that this can develop so that it benefits both the utilities and customers, whether they're residents, or commercial enterprises, or whoever? What do you think about the cultural change that needs to take place?

Ted: Yeah, that's a great question. It is a drastic cultural change from where a lot of utilities were decades ago, and even calling customers phrases like [inaudible 00:15:27], so utilities have already made a significant headway into that and really being more customer centric. I think one key aspect to really think about there is, let's not treat the customer as monolithic and try to do something to them or at them but really think about, how do we partner with the customers both on the residential side as well as commercial and industrial, and how you really develop a culture of co-innovation? So, really think it's not necessarily something that we're gonna do inside these four walls, that we're going to develop the next big thing and then launch it to our customers, but how can it be something that's a little bit more collaborative and working with them? That's often the best approach to when you really think about how to get close and stay close to the customers, and really develop customer centric solutions.

Moderator: Right, right. I've heard over and over again about how one of the challenges for utilities is that they're often operating in silos, and so that there will be DER programs or initiatives that are just separate so there's not a uniform voice to the customer, and Raghu, I'm wondering if that is something that Con Ed has addressed and has worked to make sure that there's basically a single voice in interactions with customers, just to make it a more seamless back and forth.

Raghu: Absolutely, yeah. I can speak to that a little bit from the progress and the evolution that's happened at Con Ed or Con Edison. We actually now have a new organization as of even last year called the Customer Energy Solutions, that's looking to stitch together all the different DER programs. We also have demonstration projects where we test out new business models called the REV demos. We have Utility of the Future, and we have the organization that's looking at long term infrastructure planning for the company, and that develops our DSIPs, or the distributed system integration plans, for the company all under a single organization and this evolution has been happening over the last few years since BQDM program came into being in 2014. This move is very deliberate, and this move is deliberate because we're looking at customers being the center of this change, of this distributed energy resource proliferation, and this organization is actually charged with having that holistic view, with having a single voice, without having silos that actually then offer to the marketplace, so it's not just the customers but it's also the third party companies or vendors that are offering innovative products and services to our customers.

So, really we're looking at all those and trying to speak with a single voice.

Moderator: Thanks, Raghu. Ted, let's go back to you. I'd like you to talk a little bit about the future and how you think IDER can continue to develop in a way that benefits customers, vendors, utilities, and society at large because that's really, ultimately, the promise of IDER, is a beneficial energy system that involves and benefits everyone. So, what are ways that that can actually happen?

Ted: Sure, sure. We've already covered several aspects of this already but to start off with, there's a tremendous amount of untapped value with IDER. Even the DER that's out there today are not being fully optimized, so there's a lot of value out there. So, I'm a strong believer that there will be these fully comprehensive, end to end IDER platforms will be developed. The key question is, who is gonna take the lead there? Will it be utilities? Will it be organizations like independent system operators, or other players like the Teslas and Googles of the world?

Utilities really need to be thinking about a number of things as they think about building these out. We've said it before, but I'm gonna say it again. Be customer centric and engage with customers and regulators. Have that regular dialogue. Second, is really stop playing defense only. Really think about the transformation, even embrace the transformation. Think about new business models to capitalize in it. An IDER platform is just one option of many out there. Focus on value for the customer, for the utility and other players. Find those win, win, win. Identify inefficiencies in the current value flows, and really think about solutions to address that. Innovate continuously. There's a quote from one of the German heads of one of the utilities. He was saying that, "The business models they are thinking about now are only gonna be good from the next five to seven years, and they need to keep on innovating what's next after that."

And lastly, something we just mentioned, but it's really partnering. This is not something that you're gonna develop in a black box on your own. It's gotta be something that you partner with, one or others, including customers, to jointly develop.

Moderator: Thanks for the great conversation, Raghu and Ted. A few things stand out to me. One is that even though the growth of DER has been really strong recently, we're likely just at the beginning. The second is that utilities have a decision to make. They're gonna have to decide whether they should take advantage of their unique position to collaborate with customers and third parties, or whether they're just gonna wait and see what will happen. Con Edison gives us an example of what it looks like to be proactive, and even though there'll be different situations and circumstances faced by different utilities, I think the foundation of success in the future goes back to something Ted mentioned at the end. You've always got to put the customer at the center of your decisions.

That's it for this edition of the Energy Cloud podcast. I hope you can join us for our next episode. Goodbye.