

MARTY ROSENBERG

3.11.20

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MATT KETSCHKE INTERVIEW

Q: Hi, and welcome to Grid Talk. Today, we have Matt Ketschke, CEO and Vice President of ConEd who is in charge of consumer solutions, infrastructure planning, and energy efficiency at the major utility service in New York City and the surrounding area. Welcome, Matt. How are you today?

A: I'm great. Great to be here, thanks.

Q: We want to talk, first off, about where you see the grid going in New York City in light of the fact that you're halfway through a massive smart meter installation with 3 million meters installed. You have to have one of the largest fleets of smart meters in the country. How is that working, and what is that enabling you to do?

A: Yeah, we are about halfway through our smart meter deployment. It is in total-- we're going to deploy over 4 million smart meters across our service territory in New York City, Westchester County, Orange and Rockland Counties, and a little piece of Bergen County in the state of New Jersey. That smart meter deployment is going really well so far. It is the largest project that ConEd has ever

undertaken, so we're going to spend well over a billion dollars deploying these smart meters, and what that's going to do is give us the ability to really get back to the individual customer level and see how those customers are using energy.

Q: I imagine that has been rolled out over several years. What capacity have you already gleaned, and what kind of low-hanging fruit have you been able to grab?

A: Yeah, so we have. We've been at this for a few years. We've been able to really unlock the ability to get very granular information about what's going on with a customer's energy use. One of the good examples is we provide energy to the subway system for the state of New York, and that is both the power that moves the trains and all the power for signals and station lighting and ventilation at stations. If you think about that, that's a little different than the kind of service you might provide to a normal home or business. To a normal home or business, you provide electric service, and if the power goes out, usually there's somebody there who can let you know right away, and we can respond, but for things like signal power for the subways, those meters are typically located deep inside the subway system. Then, if the power goes out, you

don't necessarily know right away if the power is out to the signals because of something that happened on the ConEd system or something that's happened with the MTA's signal system. All you know is that the signals are not working at that very moment in time, and all of a sudden the trains can't run the way they normally would. We've used what we have in the AMI system or the power of the AMI system to really see what's going on specifically at that customer's premises to be able to monitor over 2000 points on the MTA system to see if have an interruption to the electric signals at the MTA. Is it something that happens upstream on the ConEd energy delivery system, or is it something that's happened downstream beyond the meter? Then, we can get the right people dispatched right away to help the trains run smoother.

Q: This is going to be a great enhancement to reliability and security in terms of monitoring the health of the system.

A: Absolutely, it really helps us be much more accurate in how we're monitoring the system. We can monitor the system in real time, and we have had cases where we know even before the MTA knows that something has gone on with one of their signals and get crews rolling right away to get it restored, so it helps us operate the system more safely and

improve the customer experience for everybody riding the subway.

Q: What about the potential for bidirectional energy flow with customers? Does the deployment of smart meters help you get into a much more nuanced relationship and management of each particular customer?

A: Absolutely, so one of the things that smart meters let you do is in near real time monitor what's going on with customers' energy usage and increasingly with the advent of things like distributed energy resources or customer-side generation - things like solar panels on the roofs or storage or combined heat and power - we're now seeing energy flowing bidirectionally from customers. Customers at some points may be consuming energy and at some points may be exporting energy. Smart meters allow us to see that.

Q: What is the practical impact of that as we fly into LaGuardia in the coming years? Are we going to see more rooftop solar on rooftops in New York City?

A: Absolutely, you're going to see more rooftop solar. You're going to see-- one thing you won't necessarily see because it's inside the building is things like combined heat and power where they use the heat that is used to heat the

building and make hot water and that's also used to make electricity. Batteries systems will be going on the roofs and parking lots of buildings. All of those distributive energy resources essentially use the grid to have energy flow bidirectionally, and bidirectional energy really does change how the system works. One of the analogies I can use is it's a lot like traffic. The energy system was originally designed much like a highway for one-way energy flow from the power plant all the way out to the customer. Now, we have a lot of distributive energy resources. You need directional energy flow. The way our systems work, it's going to look a lot more like cross-town traffic in midtown Manhattan where you need the traffic signals to make sure that everything continues to flow smoothly.

Q: Are you already seeing an uptick in distributive generation in the ConEd's territory?

A: We are. It actually has been pretty much doubling almost every year in the last several years. We look at the amount of both solar, combined heat and power (CHP), and battery systems that are on our system.

Q: This might be a good point to introduce or ask you about the process that those have us that have been following the industry in New York and monitoring the REV development

which was launched in 2014-- how has that evolved, and how has that effected the nuts and bolts of ConEd operations and infrastructure deployment?

A: REV was launched in 2014. It basically was a look by state policy makers at how the utility business model would function and then how utilities can look at things like distributive energy resources to optimize how we design, plan, and operate our energy delivery systems. One of the outcomes of REV was the development of a process to think about non-wires alternatives. Essentially, how can we think of all these distributive energy resources and flexible load on the side of the customer or the customers' ability, essentially, to dispatch their energy use at different times a day to take advantage of when the grid has capacity. All of those things put together a portfolio of resources, distributive energy resources, flexible load resources, energy efficiency resources to eliminate or defer the need for capital investment for new infrastructure. That is a process that is now integrated into how we think about planning our energy delivery systems. We think about non-wired solutions as part of how we will overall meet the energy and energy delivery demands of our customers.

Q: A lot of the infrastructure deployments that you've been making, I would assume are logical extensions of your business. Can you separate out to what extent you would be doing what you're absent REV versus how REV has spurred you in a particular direction?

A: Yeah, so I think one of the things that REV did was really spur us to look not only at the traditional utility infrastructure investments that you would make, but then how do we look behind the customers' needs. Think of the customer as a potential resource to solve a constraint. You know, we still have the traditional role of the utility system planner who thinks about utility infrastructure, but now, that toolbox has been expanded to include those behind-the-meter resources that the customer may own and can dispatch and get paid for dispatching those into the system to solve for a grid constraint in a way that's more cost-effective and reliable.

Q: For example, time of day rates-- has that played a role or do you see it playing a role in your service territory?

A: Time-of-use rates, we have a limited use of time-of-use rates in New York at this point. I think they've been more heavily deployed in places like California. We are piloting some new pilot rates. We're actually piloting 6

new pilot rates which targeted how customers utilize the system to incentivize them to use both off-peak and to levelize their usage to the largest area possible, to optimize the delivery system, and to minimize the customers' impact on coincident peak, and to essentially pay them to do that.

Q: What about net metering? Is that a factor in your territory?

A: Net metering-- we definitely have net metering. The state has been working through a process that they term "the value of distributive energy resources," "the value of DER," sometimes called "deer." In that process, we're looking to work together with stakeholders and the state regulators to find us a successor tower for net metering that will be more reflective of the actual cost to build a delivery system and the value that distributive energy resources bring.

Q: As you look at it over the vast ConEd service territory in New York City, do you find these new sweeping changes-- are they primarily going to affect major property owners, large buildings? Will it be individual consumers? Will it be businesses? How do you see this being embraced by various constituencies?

A: There are definitely groups of stakeholders that will be involved in different ways. For example, if I think of my average in-city residential customer, they actually have a relatively small footprint, so a typical in-city New York City customer uses about 300 kilowatt hours a month and has a typical bill of around 85 dollars a month. For them, you know, most cases, they either don't have the ability to or necessarily the economic incentive to make radical changes in how they're using energy. But those are customers who we see a lot of engagement around energy efficiency in the context of how you use energy-efficient appliances or make more energy-efficient choices or think about, you know, using a smart thermostat to optimize some of their dispatch of energy. A lot of our customers are interested in that for the value, the economic value and for the carbon reduction value, of making those decisions. Then, that ranges all the way up to the largest commercial customers. These are large-commercial property owners and how they think about doing large projects that may include distributive generation, storage projects, coupled with energy efficiency to lower the overall demands on large commercial or multi-tenant residential spaces.

Q: So, you see more activity there and more engagement at that

level?

A: We think of this as kind of all across the different channels. There's definitely a lot of activity that's going to go on at the larger commercial building space. Actually, in New York City, a local law was passed that requires buildings to look at kind of their energy profile and how they can become more energy efficient. There's definitely a lot of activity in that space in thinking about how to help large commercial property owners do those things.

Q: Let's talk about battery storage for a second. I understand you have an RFP for 300 megawatts of storage. That doesn't sound like a lot, but considering that my readings of federal figures-- there were just 900 megawatts installed nationwide as of last spring. That's a significant hunk of storage. What is the time table for bringing that on, and what capabilities do you see that giving your company and your customers?

A: We have a solicitation out for bulk storage for 300 megawatts, and one thing to think about when you think about storage is storage is both-- has the energy value or 300 megawatts, but then also it's time duration, so how many megawatt hours would that be. In the case of our

solicitation, we were looking for four-hour storage products, so 300 megawatts would also be 1200 megawatt hours. In that, that would be one of the largest storage solicitations out right now. Nationally, it would really move the total amount of storage installed, move New York up pretty far in states that have energy storage deployed, but it is still a relatively small percentage of the state's overall goal of achieving 3000 megawatts of storage over the next several years.

Q: Are they small-scale units? Are there large-substation-scale units or a combination of both?

A: Our solicitation actually looked for either large, essentially substation level, projects or more like medium-sized grid connected or distribution-connected projects. We solicited and said developers could purpose either or both. This solicitation didn't target the smaller systems that would be behind customer meters, things like Tesla Powerwalls that are really geared more towards the residential, small commercial space. These would be large, industrial-sized systems. We're not through the entire solicitation and contracting process, but I would envision them to be, you know, systems that could be 70 or 80 megawatts worth of capacity with a four-hour duration.

Q: Talk a little bit about what the practical impact of that will be. Will the main value be to allow a more nuanced control of the grid and management of peak hours? Will it be able to come back fast from an outage caused by factors outside your control? How do you see it helping you early on and maybe down the road?

A: I think one of the big things is storage is going to be one component in how we think about decarbonization and the increased penetration of the renewable resources on our overall energy supply next. I say one component because it is one piece of what we really need to think about in the longer term, and how we balance out our supply as we move away from predominantly generation which is based on dispatchable resources, whether those are dispatchable hydro, nuclear, or fossil fuel into a place where more and more of the supply is being made up by renewable resources would be non-dispatchable, things like solar and wind which are only available when the sun is shining or the wind is blowing. One of the things we're going to have to do as an industry is work on how we balance these intermittent resources with customers' demand, and batteries are definitely going to be one piece of that. The ability to bank and store energy so that you can buffer both short-

duration events-- things like if you're having a lot of solar on your system and cloud cover rolls through and the solar drops off, how do you buffer that for, you know, minutes or shorter durations of time up through how we think about buffering through long-duration events like peak loads in the summer or winter time when you have maximum cooling or heating. Maybe the wind isn't blowing and the sun isn't shining. How do you think about moving energy seasonally between spring and fall when there may be overproduction to winter and summer when there's more demand? Batteries are one piece of that.

Q: What's the scale of renewable generation currently from wind and solar in New York, and how fast do you see that ramping up as this battery storages comes online?

A: Today, renewables are a relatively small piece of the overall New York state portfolio, but the state has goals of getting to 100% decarbonization of the electric production sector by 2040. We're looking at a state goal of 9000 megawatts of offshore wind coming in here by 2030, so those are very fast ramp ups in how quickly we're going to see the renewable penetration coming in. Even today, it's not the majority of the resources. We're still driven by hydro and nuclear being our predominant non-carbon

renovating resources, and natural gas being the biggest piece of the supply mix that comes from carbon-emitting resources. As we move forward with more and more wind and solar, there's going to be a need to balance those resources out, storage being one piece of how we do that.

Q: At 9,000 megawatts of offshore wind, is that destined for New York City or the whole region?

A: You know, New York state has many regions. New York state operates as a regional transmission system with the New York state independence system operator, and we do have flows. Typically, the flows come from the north, from the hydro and nuclear in the northern part of the state down toward the population centers in the southern parts of the state. Most of this offshore wind, if not all of it will be located off of New York City and Long Island, so you're going to see injections here now at the southern part of the state. Some of the modeling indicates, as you get to those deeper penetrations of offshore wind, you may see periods where the transmission flows of energy actually reverse, as opposed to flowing north to south, we may see times when offshore wind production is high enough that it actually exceeds the load in the New York City area and Long Island and reverses and begins to flow towards upstate

New York.

Q: Turning to EVs for a second-- how has the acceptance of EVs in New York compared to other parts of the country, and what kind of efforts are you mounting to help charge those cars and trucks and buses?

A: I would say the leading state in electric vehicles, at least at this point, has definitely been California. California has been at the leading edge of that, but New York is not necessarily far behind. The state has put forth an effort, first, to incentivize the adoption of EVs by deploying electric charging. The New York Power Authority and state of New York has worked to develop, essentially, a charging corridor that runs the major highways through New York so that EV owners who are looking to travel have a place along the major highway corridors to charge. For us in New York City and the New York City area, we've been working with customers to facilitate adoption both by helping charge providers to deploy charging infrastructure, so working with the New York City department of transportation to install 100 curb side chargers around New York City and then also to send pricing incentives for customers who own EVs to charge in the off hours. We have a program called Smart Charge, and that

gives customers an incentive to charge their electric vehicles off hours.

Q: How many EVs are there in New York City right now?

A: I apologize. I had that number, and now I do not have it in front of me with the total number of EVs.

Q: Without the actual number, I mean, is it significant, or is it still microscopic?

A: Right now, each year-- so, three years ago, it was about one-half of 1% of all sales. Last year, it went to 1, and this year, it's closer to 2. Each year, we're seeing a doubling of the sales of EVs, and by county, the New York City metropolitan area now has more electric vehicle registrations than any other county in New York state, so we're definitely seeing an uptick in the adoption, and also, more manufacturers have more vehicles readily available as part of what they're rolling out and selling.

Q: One problem I would imagine is being a fairly densely populated area with a lot of apartment buildings. People park on the streets. Is ConEd looking at solutions to helping customers that might not have a parking garage to charge their EVs?

A: Yeah, we are. Two ways to really think about that problem. One is curbside charging. Can we deploy charging in a way

at the curb side that will give customers access to charging infrastructure if they street park. We've been working with the New York State Department of Transportation to locate 100 chargers in curb-side spots, so it would be publicly accessible to people essentially when they park. One of the advantages to those is, because they are curb side and they are associated with parking, they don't have to have the kind of high-energy value that fast charge would have. These can be slower, less delivery infrastructure necessary to provide that kind of charging. The second way we're working is working on fast charging, and these would look and feel a whole lot more like a gas station, some place you and full in and use a high-energy charger to charge your vehicle quickly, typically 20-30 minutes. You can pick up a significant charge to extend your range. We've been working with the city to deploy several fast charges around the city, first, using some of our own ConEd property with third-party charge providers who can install the infrastructure.

Q: What about your bus fleet? Are there plans to electrify that?

A: There are. The New York City metropolitan transit authority is looking to electrify their fleet. They have a

goal of electrifying all of their fleet by 2030, and today, they operate around 5000 buses, so that is a large fleet, one of the largest fleets of buses operating by any transit operator in the United States. So far, they've worked on some pilots, so they've electrified portions of the line that runs-- it's called the M42 bus line that runs along 42nd street and portions of the M14 bus line that runs along 14th street. They've electrified both of those with electric buses. We've been working with them on how do they think about their need for infrastructure as they begin to build up their bus depots and move from diesel- or natural-gas-fueled buses or hybrid buses into all electric buses.

Q: Having lived in New York City and familiar with the extensive bus traffic as well as delivery vehicles out into the boroughs, as you move towards decarbonization and electrification of everything, that's going to put an enormous infrastructure challenge, I think, on ConEd. Talk from the 30,000-foot level of where you're business is headed and where the New York City grid is headed as electricity really gets to play a more and more sizable role in your local infrastructure.

A: One of the things we do spend a lot of time thinking about

is, as we move away from final end use energy being driven by carbon-emitting resources - and if I think about that, that's things like liquid fuels, gasoline, diesel for both transportation and heating - and we move toward electricity being how customers are at the final use or the end use of energy, we will see an increase in overall electric demand. Now, one thing is that there's the overall electric demand, and there's what is the coincidence of that demand or all these different uses. How many of them occur coincident with where our peak energy use is today. Today, our peak energy use happens to be around the hottest days of the years. For some of these applications, you can see the ability to do a lot of electrification and not necessarily have it immediately cause the need for system reinforcement, so things like heating. Well, you can move buildings off of oil heating on to electric heating, and that doesn't necessarily, at least the beginnings of that, cause the need for increased infrastructure because it's not coincident with what you're peak is today and how your system is built up for size because that's for the hottest summer day. We are thoughtful that over time you will likely need increased electric infrastructure as you move more and more of the final end use energy for consumer

applications into electricity.

Q: Is it ever overwhelming or do you think you've got your hands around this and know exactly what you need to do?

A: I don't think it's overwhelming. I don't think it's something where we have to be thoughtful and careful about in how we plan. Some of these applications happen quickly, but some of them likely happen over time, so typically, both the New York City metropolitan transit authority and all their transit operators-- a typical lifespan of a bus is about 13 years. They've only just begun to build buses into their fleet in the last year or two. It will take them time to roll over their fleet. Similarly, if we think of electrification of heating, those aren't things that necessarily happen overnight. Typically, a system will get changed out about every 20 years. Some of these things will happen and occur over time. I wouldn't put it in the category of overwhelming, but I would put it in the category of something that we are paying very close attention to and likely means that there will be continued need for investment in energy infrastructure and delivery infrastructure as we move into this decarbonization transition.

Q: It's a very different business. I believe you came into

Con Ed back in the 1990s. It's a very different business now going forward than it's been. Talk a little bit about how prepared you feel and your team is and what skill sets you're bringing in.

A: It is. Things have changed a lot in the 25 years that I've been doing this. Even just a few years ago, I think you and I may have talked about this over time. There was a lot of discussion of the utility death spiral that, you know, electric companies in particular were seeing decreasing volumetric sales, and the whole business model was in this death spiral. That's something that we don't even hear any more as now we're talking about decarbonization and electric being the driver behind decarbonization, so I don't try to predict the future necessarily because I think it is subject to so much change, but what is clear to me at this point and where we are is that if and as our region and nation want to move towards decarbonization, the electric system is critical to help make that happen and that you will need a viable business model for the electric utilities and folks who are responsible for providing that infrastructure to go out and do it. I think we're at that point in New York. I think the New York state regulators have really looked at how the

business model evolves, how to incentivize utilities to achieve on-state policies like decarbonization and how to make sure that's sustainable.

Q: Fascinating. Thank you, Matt.

A: Great, thank you.

Q: And thanks for listening to Grid Talk. We've been talking quite in depth with Matt Ketschke, Senior Vice President of ConEdison, and we appreciate his insights of the changing electric grid. If you like this podcast, please go to our site, SmartGrid.gov, to subscribe, or you can visit your favorite podcast platform on your smart phone. If you have any feedback or questions, please direct them to GridTalk@NREL.gov. Thank you, and have a nice day.

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