

UTILITY EXEC'S' ROUNDTABLE

Utility's Role in Electricity's Future

PART I



We sat down with execs from seven utilities in the Northeast who help lead their companies on future strategies



tility of the Future. Utility 2.0. Distribution System Operator. Reforming the Energy Vision. These are just a few of the terms popularized in recent debates about the utility’s role in electricity’s future.

Some say the utility’s role will be much changed and much diminished. Third parties shall increasingly meet the emerging wants and needs of electric customers. Many more say they’re not so sure. But even they accept there will be changes and challenges aplenty.

Navigant and *Public Utilities Fortnightly* convened a roundtable of utility execs to peer into electricity’s future. Hosted by Con Edison at its historic Manhattan headquarters, execs from seven utilities in the Northeast U.S. took part.

PUF’s Editor Steve Mitnick led the discussion of part I, focused on what changes are coming down the pike. The transcript of that discussion is here. Navigant’s Jan Vrins led the discussion of part II, focused on how utilities are preparing for this future. The transcript of that discussion will be in March’s PUF.

Part I: Changes and Challenges

PUF’s Steve Mitnick: Why do you think the role of the utility in the electricity industry’s future has become a major topic?

Stuart Nachmias, Vice President, Energy Policy and Regulatory Affairs, Con Edison: I would say it’s a major topic because it’s changing from building and maintaining a system that solely delivers energy to customers as takers on the system, to building and maintaining a system where some customers will also produce energy, using the grid in new ways.

For example, technologies are evolving, and there are customers that might have distributed resources on their property. Some customers may be interested in demand response programs. How the system is going to be managed will change as we consider these resources.

It’s not only customer technologies. But, also technologies in terms of how we manage the grid itself. Data and information about the performance of the grid is becoming much more granular and available in real-time. Those factors are just changing the information about the grid and the tools available to manage it.

Paul Haering, Vice President, Engineering and System Operations, Central Hudson Gas & Electric: It is an evolution, in terms of what used to be a one-way power flow system. We are now becoming a much more dynamic power flow system with the proliferation of distributed energy resources. Who knows to what extent that’s going to occur?

An example, for us, is an interconnection queue that exists today of close to eight hundred megawatts of PV on a peak of a thousand megawatts. When you start talking to me about penetration levels of that amount of PV on a system like ours, the system could effectively become a net generator for much of the year.

That is going to create a substantial impact on the utility and what the utility’s role will be. There are going to be other things that we will provide, including additional services and things that enable market operations.

It’s changing from building and maintaining a system that delivers energy, that meets customers’ needs as just takers on the system.

The state’s policy with the clean energy standard, and the implementation of “fifty-by-thirty,” is an area where we see a tremendous change in the role the utility has played historically. And where we are planning to head for the future.

Jeff Ballard, Vice President, Smart Grids, AVANGRID: Certainly, the broader ecosystem is changing. I think in terms of timing, there is a convergence of many factors, including decreasing

technology prices and increasing focus on clean energy.

There is I think a general recognition of an industry transformation, and the recognition that in order to achieve a sustainable outcome, we need to transition to something more comprehensive than just incenting and subsidizing the endpoint resources.

There’s now a shift in looking at the model. And a realization that you need an intelligent network to capture the true value of those resources you are putting out there. Early on, it was about the end points, getting them out there, and prices declining.

Kim Harriman, Senior Vice President, Public and Regulatory Affairs, New York Power Authority (NYP&A): Following the Recovery Act of 2009, and the proliferation of smart grid funding, we were all looking at smart sensors and meter deployment in mass quantities, and getting better situational awareness. That was or was not successful, depending on where you were in the country.

What I think happened in New York specifically, is that we had two hundred-year storms back-to-back. You saw the decimation of basic infrastructure from energy to telecommunications to basic human services, in a catastrophic way. This required that senior New York energy officials and experts convene and

ask a fundamental question: Why isn't our grid more resilient?

These conversations launched an extensive policy discussion that asked: How do we rebuild a resilient electric system? As the conversation progressed, it became apparent that resiliency is not only about situational awareness at the distribution-to-network level, it is also about how energy flows to the home.

This led us to investigate how we could create a distributed generation supply chain that addresses the resiliency question in a way that is complimentary to and not disruptive of the whole grid. These exchanges culminated in Governor Cuomo's landmark policy, "Reforming the Energy Vision."

We also looked at central station generation as not being the only solution to managing power supplies and flows on the system. And that, coupled with the renewable energy review, led into the Clean Energy Standard, CES. I think there was a cascade effect.

If I had to look back at the sixteen years I have been in the industry, I would say it was the two hundred-year storms that forced people to rethink every stage of power generation and start the process of creating a better solution than what we currently had.

Jorge Cardenas, Vice President, Asset Management & Centralized Services, Public Service Electric & Gas (PSE&G): Here are three components. First, customers want more reliability than ever before. They also want self-sufficiency. They want to be good stewards of the environment, and that means making more green energy available, whether it is generated by the consumer or a utility.

Then, there is technology. Technology has advanced to a point where other solutions, other ways to distribute electricity, like solar, storage, and microgrids, are now available at a reasonable cost, or at somewhat subsidized levels, making them affordable for customers.

Finally, people want reliability. Customers no longer say, "I have no power. No big deal." They want reliable service now and all of the time. This fuels the drive to find other ways to make the grid more resilient, make it more consistent.

There are devices, whether it's a smart meter or something else that can let that customer know when his power is not perfect. These three pieces coming together make it viable. I don't think of it as a utility of the future. I think of it as serving the customer that's now and into the future.

David McHale, Formerly Chief Administrative Officer, Eversource: The customers' expectations are increasing. They have been taught recently to expect more from the marketplace.

Whether it's UPS or FedEx, there's the whole digitization of the economy. Customers are now thinking, wait a minute, why shouldn't I get that from the utility? Kim's comment on the storms, those were so profound, in that the storms did increase customer expectations.

The last four to five years that I have been involved in our

customer care, customer service and technology, we are spending more in capital there than we've probably ever spent in the history of the company. Because the customer expects real time information and actionable communication.

They expect to leverage all the investments that have been made into the grid, in the way that they know their package is waiting for them at the front door. Rising customer expectations make for a profound change in our industry.

Mike Calviou, Senior Vice President, Regulation and Pricing, National Grid: The key themes across the industry are driven by de-carbonization, the need to hit 2030-2050 targets, decentralization, changing technology, and fundamentally what customers need.

There's no doubt there's a massive shift going on in the industry. Though actually what that shift will end up looking like is uncertain. None of us know the future.

Ultimately, we have a diversity of customers. Our customer expectations are increasing. Some customers will be very sophisticated. They'll want to be self-sufficient. They'll want to have decentralized energy. They'll want to have their own storage.

They'll want to play in very sophisticated ways.

Others won't want to, and will want to rely on the utility to continue providing the very high reliability service that people increasingly depend on to power their everyday lives. And they care about the quality of the environment and the effects of

Flexible and adaptable is not necessarily an inherent trait of a regulated utility.

climate change, including the need to hit 2030 and 2050 de-carbonization targets.

That's a diverse set of requirements to manage for our customers, policy makers, and colleagues. It's going to get to be a very complex and messy world.

We won't do some things, maybe, for every customer that we've done in the past. But utilities will need to be the platform, the facilitator that knits everything together, and will need to meet customer expectations that are continually changing and increasing.

PUF's Steve Mitnick: How are the role and scope changing, and what are the risks and benefits?

Stuart Nachmias, Con Edison: If you think about how the utility's role as the operator of the grid is changing, and getting more and more data and information, the question goes back to how can that data be utilized to help customers?

For Con Edison, in 2017, we are starting our biggest capital program we've ever had, to put smart meters in place. We're going to, over seven years, have more data about every customer's energy consumption.



You couple that with what we're doing through REV, and through the demonstration projects, where we're trying to work in new ways with our customers. We will be using data and information in new ways.

We will be able to provide alerts about how they're using energy, how they might use energy in new and different ways, and what types of equipment or products and services might be useful for some customers.

You start to put together the picture of utilities having a role in enabling a lot of these activities, enhancing their relationship with customers, working with third parties, identifying new potential revenue opportunities, and new ways to facilitate the types of technologies that are available. Ultimately to help target those resources in the right place – to manage the system in better and new ways.

I think our role is changing, and the relationship with our customers is going to change, and I think deepen, depending on the preference of the customer. Some customers will want that to deepen one way, and others another way.

Up until now, residential and small commercial customers are in Service Class 1. We treat them all as if they are the same. As we get more and more information, we can start to differentiate among customers.

We probably won't get it all right at first. As we become more flexible and adaptable, not necessarily an inherent trait of a regulated utility, we will evolve further to meet customer needs.

Paul Haering, Central Hudson Gas & Electric: We're a little bit different. We think there's a subset of customers that are and want to be sophisticated about their energy decisions. We see that today, in terms of customers that migrate off bundled service.

We've got customers that are the large commercial, industrial, maybe a small subset of residential customers that have a desire

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to be more sophisticated, and want to play in these emerging markets.

We don't want to drive our decisions based on policies that treat customers like laboratory rats. We're taking a much different approach. We are implementing some core foundational investments that arguably will provide value to customers regardless of whether these policies are fully implemented or not.

We have a Distribution Management System with further automation of the system and more intelligent sensors. As well as the communication infrastructure that allows for bringing that information back to a central base decision point to make educated decisions about how to operate and manage the system.

The reality is when it comes to smart meters and deploying them, we don't see the business case for that. To the extent customers want that information, we'll make that information available. You want to pay for it? You get that information.

But not to treat three hundred thousand customers effectively the same. Not everybody wants all the information. The reality is, if I look at my concentration of load, four percent of my meters are forty percent of my demand, and fifty percent of my consumption.

Why would I go and treat a hundred percent of my customers the same when I can probably get there with twenty percent customer penetration? And get sufficient scalability in terms of control of demand and consumption?

I think we need to be conscious of what we're doing here. And not just do investment for the sake of doing investment. I'm



worried that ultimately the cost burden on customers is going to be appreciable.

Whether we realize these benefits or not is a concern that we have. When you look at it from a role perspective, we've got to enhance our planning proficiency.

There are things we need to do today. When we talk about further DER penetration, to better understand how do we integrate that into the grid, and get value out of that. From an operations standpoint, it's the same thing.

How do we bring back that intelligence that we have, that we're building into the grid, and make better operating decisions? Ultimately, then, into the market as well. How do we create a market?

I think one of the problems we're seeing is with the policymakers. They seem to be avoiding the hard decisions about valuing these new resources. And they are just migrating from providing subsidies of one flavor, treating it as something else. It's effectively still subsidization, and there is still limited requirement for these resources to perform to benefit the grid.

We create rules for resources that may be inequitable to what's required within the wholesale markets. That becomes problematic. Not everyone is playing by the same rules.

Ultimately those risks could result in less reliability for customers, and higher costs. What results then from a wholesale perspective, from an ISO perspective, is we need to commit additional resources. Because we're worried about whether these DER will perform. So, you effectively have an oversupply. Ultimately somebody needs to pay for that.

We better get this right. If we don't, it's going to be back on the utilities, in terms of not being able to meet our obligation of providing safe and reliable service for customers. And we won't get improved reliability. We're going to see reliability deteriorate.

Jeff Ballard, AVANGRID: In terms of how the role and scope changes in the future, first I'd mention that we still retain our role of providing safe and reliable service at just and reasonable

You've got more planes up in the sky. How are you going to keep track of them so they don't run into each other?

a new role and a set of functions that we need to perform as a utility in order to identify, attain and ensure the performance of those solutions on an ongoing basis. So, we're expanding the level of things we do there.

In operations, we're managing the much more sophisticated grid, thousands to millions of resources. At one point, they're generating. At one point, they're consuming. That expands our operational role considerably.

If we apply automation appropriately, it allows us to do that in a coherent way, in a centralized fashion.

From a customer perspective, our customer relationships expand beyond transactional aspects, and start to take on more of a trusted broker role.

We're helping connect them as a market maker in some cases. 'Hey, looks like you may have an opportunity here. Let me connect you with someone who can help you solve that problem.'

There are some modest things that will go away. But, generally, the complexity of running a utility has increased, not decreased.

It's all about timing, and alignment. Making sure what you're doing is not too far ahead of the customer or the market. But having a plan and staying far enough ahead, so you're proactive in building for the future.

That sounds easy. But it's a significant balancing act to get the timing right.

rates. So, we have that primary role. On top of that, we're adding functions.

In terms of the role of the utility, it expands our approach to planning. We're now incorporating non-traditional solutions as part of our planning process, where in specific situations we will implement non-traditional solutions, versus build our own traditional solution. That creates

Two other risks are speed and coherency. You need to be careful you don't take shortcuts that might get you to a piece of what you're trying to accomplish faster, but make it very difficult to achieve the ultimate sustainable model. I think those are big risks.

On the benefit side, we are no longer having debates around the value of the grid and the need for a platform. I think the importance of the grid as an enabling platform is now understood. Had we'd gotten around the table six or seven years ago, we might have been having debates on that. I also think there is a realization that you need an intelligent fabric to develop this ecosystem, not only electrically, but also in terms of the construct in programs and roles of the various players.

Kim Harriman, NYPA: With the need for more granular awareness of consumption by our customers, also by customers in the governmental buildings that we serve, we're looking at how we get transparency in usage at a distribution level, without being a distribution provider. We want to do this solely for the purpose of driving informed customer decisions.

New York Energy Manager, if anybody has seen it, is amazing. It's an example of the role change that is happening in the utility space, at NYPA. Eighteen hundred buildings with sensors, both at the meter and equipment level, to measure and track real-time usage. And to inform behavior changes. You can aggregate some of these big buildings, to enable them to bid into a variety of programs that are available, or may become available.

The scope is changing. For the distribution utility, it's like being an air traffic controller at a local airport. You've got more planes up in the sky. How are you going to keep track of them so they don't run into each other?

The good news is that these new digital systems will enable us to address three important issues simultaneously: reliability, safety and security. The risks obviously are, the more portals we make into the system, the more concern you have about cybersecurity.

Jorge Cardenas, PSE&G: Customers don't care where their electricity originated. If something goes wrong, the utility is going to be held responsible for not providing the electricity.

We need to embrace and integrate the technology that will allow us to ensure every customer has reliability. That is our fundamental responsibility.

To do that, we're looking more and more at technology. I'll have been with PSE&G forty years. Twenty-five years on the electric side, fifteen on the gas side. Today we are deploying more advanced technology in our electric and gas systems, and faster than ever before.

A new EMS, a new ADMS, a new SCADA system, fifteen hundred microprocessor relays. These are things that will enable us to be that traffic controller, to ensure that we know where the nodes are. To know what the flows are, where the problems are, and gain a detailed, real-time view of our system in a way we've never had before.

We want to add smart meters in our system, and I know smart meters are much more than smart. They can anticipate failures and provide customers information about their energy usage. If we were able to see a voltage fingerprint indicating a shorted transformer winding and we knew it would fail soon, we could fix it before it fails.

It would save an outage for customers and may prevent an oil spill. And we can do it in the daytime, at half the cost of taking a crew out in the middle of the night.

There are a lot of things that we need to be ready for. Our role is to anticipate, maybe not quantum leap out twenty years, but be attentive to changes. We must ensure sure our system is capable of addressing and integrating those pieces. Some are ours. Some are not.

I remember the blackout I saw from the other side of the river in 2003, and the investments in transmission we made after that.

If something goes wrong, the utility is going to be held responsible for not providing the electricity.

We have invested billions of dollars in transmission during the last few years.

We need to do much more with equipment in our substations and in the street. I call it the last mile. The transformer, the service line. We've done more work with substations. We've raised them, because of flooding from severe weather events like Superstorm Sandy.

Much of the equipment we have out there can't withstand rising water levels. We need to replace it with equipment that can weather a tidal surge or river flood.

David McHale, formerly Eversource: I see an expanding role for the utility. I have never been a believer in the death spiral.

The Eversource companies are building out. The new seaport district in Boston is where GE is moving in. If the lights go out, GE won't be happy.

In parallel, we can start moving towards the customers we've talked about. I think that the customer relationship in this business, even from a Wall Street standpoint, is undervalued, under-appreciated and under-recognized.

There's virtually no customer acquisition cost for a utility. You have the customer.

There are folks in the business who talk about the traditional model being, 'Make, Move, Sell.' Maybe now it's, 'Make, Move, Sell, Service.' Which is more focused on sophisticated services, not just connecting a customer. But, providing integration.

One of the things Eversource did early in the game, and is doing now, is building out energy efficiency offerings and customer engagement platforms. For customers to peer into what's happening in their home.

We don't do this ourselves. We work with a set of emerging companies in the space who act as partners and innovators to help create inventive solutions. Through the data, you can get an understanding of which customers are more likely to use these services.

So, you can focus your investment dollars, and your energy efficiency dollars. If you do this correctly, you can create customer advocates. Everyone sitting at this table needs more customer advocates. You are creating customer value in a way that you hadn't before.

The risk is you get it wrong. That all these great things you promised customers don't come to be, and the company's reputation is in a bad place. The upside is that there is no death spiral.

I spent seven years as a Chief Financial Officer. I still have that DNA in me a little bit.

It gives you that revenue stream. Maybe it helps you with your earnings, and dividend growth aspirations. That's good for shareholders and customers. And you don't dry up and blow away.

I am not saying you can generate billions of dollars off that customer relationship. But I think you can do it in a way that we haven't focused on in the past as an industry. So, in parallel, customer value creation, and shareholder value creation, are not at odds. They are symbiotic.

Mike Calviou, National Grid: There will be a big need for us to come up with more innovative solutions, to partner with people a lot. We can't assume that we're the monopoly, and the way we want to do things will be the only way.

The NY REV demonstration projects are good examples of this. For example, Buffalo-Niagara, a medical campus, where we're partnering with them. Technology providers, for example Opus One, partnering with customer groups, to develop a small-scale demonstration of the Distributed System Platform concept.

Our 'Community resilience' microgrid project in Potsdam [New York] is very similar. There's real potential for coming up

with new and different ways of doing things. That is different from utilities' typical way of acting.

We also have to look broadly at the need to de-carbonize. It's not just electricity we need to de-carbonize. It's the energy use of the entire economy. We need to de-carbonize transport. We need to de-carbonize heat.

Electric vehicles are going to be a massive issue that utilities are going to have to embrace. Yes, that is increasing demand for utilities. But what is our role in the changing infrastructure? I don't think any of us know the answer. But we need to think about that.

I see an expanding role for the utility. I have never been a believer in the death spiral.

The risk is that you make some big bets. I think it is very easy to assume what the future is going to be, and bet your money on that one version. The reality is that there is so much uncertainty.

I think for us and our customers it's better to make a series of small bets. For example, we are doing a smart grid project in Worcester, Massachusetts. We're leveraging off that, with a similar project in Clifton, New York.

We think it's best to take a series of small bets, and not to bet the whole house on one version of the future. The future may turn out different than any of us expect and customers might respond differently to different offerings.

We are putting gas pipe in the ground, and normally recover the costs from our customers over forty to fifty-year asset lives. However, by 2050, customers may rely a lot less on gas because of new technology.

We need to be very thoughtful. What sort of big long-lived investments are we making? And what, fundamentally, is best going to meet the customers' needs? **PUF**