

powering the people

next generation utility

THE 21st CENTURY GRID: THE UTILITY'S ROLE

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The 21st Century Grid: The Utility's Role

Moderator: Theodore F. Craver, Jr., Chairman, President, and CEO, Edison International

Panelists: Leslie Sibert, Vice President, Distribution, Georgia Power

Eric E. Silagy, President, Florida Power & Light Company

David M. Sparby, Senior Vice President, Group President, Xcel Energy and President and CEO, Northern States Power Minnesota

Michael Yackira, Chief Executive Officer, NV Energy

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Ted Craver: Probably each of you directly involved with a utility has pretty much the same mission statement: to provide safe, reliable, and affordable – and now, clean – electricity for your customers. If we don't do that well we're not satisfying our fundamental mission. The key part of delivering on that mission is the grid. It's the essential core of everything we do. But how do we continue to make sure the grid is reliable, resilient, the center of our modern society? I'll start this discussion by asking each of our four panelists to tell us what their company is doing to modernize and build the next generation grid.

Leslie Sibert: I'm with Georgia Power, a subsidiary of Southern Company, which has four other electric utilities that serve in the states of Alabama, Georgia, Florida, and Mississippi. Throughout the Southern Company system we have been very engaged in modernizing the grid, making it smarter and more self-healing. Our system can detect when a piece of equipment's health is failing. It can integrate distributed resources and energy storage. Advance-

ments in microelectronics, information technology and communications have helped. We started all this before it was about a smart grid. The smart grid investment grant we received from the Department of Energy in 2009 enabled us to advance all of this more quickly. Across Southern Company, over the past ten years, we've spent over a billion dollars, including AMI deployment, on smart grid investments. As a result of those investments, our customers have benefited from efficiencies and improvements in reliability.

Eric Silagy: Like Southern Company, Florida Power & Light has been investing significantly in transmission infrastructure. We serve about half the state of Florida, so we have a large footprint from a geographic as well as a customer standpoint. We serve about 4.7 million customer meters and our territory stretches from the Florida/Georgia border on the East Coast down to Key Largo, and then up to Sarasota on the West Coast. It includes 35 counties and 27,000 square miles. We have about 74,000 miles of line in the system. We completed an \$800 million upgrade to our system last year, installing 4.6 million smart meters and about 10,000 smart devices on the distribution and transmission networks.



Ted Craver

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We're also looking at grid resiliency. It's great to have a smart grid, but being subject to adverse weather we have to make sure the grid is resilient. So we're also investing in technology to make it both stronger and more resilient in bad weather.

Outside of smart meter deployment, we're spending about \$200 million dollars a year. We just completed a \$500 million storm-hardening program that was a phase 1 project; we're now in a \$600 million phase 2. The \$200 million DOE grant we received for smart meter installation is a good example of a government program that really works, because it helped us accelerate that program. The information we're getting now from those meters has already been of tremendous benefit to our customers. We've improved customer interactions and it helps with our "trouble tickets" and storm response. Last year we had 1600 trouble tickets created and resolved before the customer ever knew about any trouble. Little things like that are already making a big difference.

David Sparby: Xcel Energy serves some 5.5 million customers in eight states across the West and Midwest. We're replacing or re-powering our infrastructure, managing to much higher environmental standards, and we're integrating a lot of technologies that previously weren't economic for us. We're also seeing new issues arise in our rate cases, our resource planning, and our pricing proceedings.



David Sparby

Looking ahead, we know we'll be required to change our prices more frequently than in the past. And we'll need flexibility to offer the portfolio of resources our customers need, especially our municipalities, to meet their carbon and renewable objectives.

We're also working on getting

our pricing right, as we continue to customize our distribution services, to ensure that nonparticipants don't pay for new services they don't use and that we can recover our costs. Our distribution capital spending the last five years has been between \$400 million and \$500 million per year. Although our total spending level has been increasing, the amount of capital

allocated for new customer additions is less than in many prior periods, with fewer customers being added to the system.

Michael Yackira: NV Energy serves about 95 percent of the state of Nevada, a rather small state from a population

perspective, but very large geographically. We were the first investor-owned utility to reach an agreement with the DOE to get a grant for stimulus money that provided about half the cost of our smart meter program throughout the state, which we completed last year. We're already seeing a change in our customers' behavior, which we're integrating back into our operations. Like others, we're seeing outages before our customers are aware of them, and can tell customers promptly when we'll get them back on line.

Most of our work has focused on creating a mix of generation units. For about 25 years, we hadn't invested in new generation supply, and owned only about 35 percent of the capacity we needed to serve our load. We've now expanded that to over 85 percent. Also, we just completed a 500 kV transmission line to tie our northern and southern Nevada systems together. We spent about \$500 million on that project. Over the past ten years we've invested about \$700 million on grid resilience and grid technology.

Craver: EEI has put some interesting data together. In the 2014-16 period, it estimates that the investor-owned utility sector will spend nearly \$90 billion each year overall, with a good bit of that figure on grid modernization. Will these investments produce big gains for our customers?

The key part of delivering on our fundamental mission to provide safe, reliable, and affordable – and now clean – electricity for our customers is the grid. It's the essential core of everything we do.

Sibert: We expect the gains will be in keeping costs low. About 48 percent of Southern Company customers earn \$40,000 a year or less, so energy cost is very important to them. Efficiencies we've gained by some of these deployments have helped us keep costs down. Because our networks are now self-healing, we've seen a significant reduction in outage minutes and improved our service levels.

Silagy: We look at the whole customer value experience. In the last five years we've invested \$15 billion in our system, including new generation. About ten years ago we started to wean ourselves off using oil as a principal generation source. At the time we were burning more oil than any utility in America: 41 million barrels a year. Last year we burned just 250,000 barrels; and that was only because we have to burn oil to prove that we can generate with it if we need to, otherwise we would've burned none. The benefit of that comes in a variety of areas. And it's helped us control costs for customers.

In the last five years, customer bills are actually down 15 percent net. Customers are paying us less than they did five years ago – actually, in real terms they're paying at the levels we were charging in 1982. A lot of that stems from what we're using for our generation fuel mix, but also the productivity of the company itself, including its workforce. We're doing more with fewer people because we're relying more on technology. In the mid 1980s, we were a company with 2.6 million customers and 14,600 employees. We're now serving 4.7 million customers with just 8,900 employees,



Eric Silagy

and providing better reliability than ever before, at 99.99 percent. Technology is allowing us to be smarter and more effective.

Little things add up to big numbers – being able to reduce truck rolls, or identifying a grid problem, because smart technology allows us to know exactly where

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there's a problem rather than having to "ride the lines" to try to figure it out. When you multiply that over the course of a year you save a lot of money. Last year, because of smart grid technology, we saved \$3.4 million through productivity gains and avoided 4.3 million minutes of outages at the customer level. That's directly attributable to smart grid technology on the grid and in smart meters.

Sparby: For Xcel too it's been improved reliability, improved response time, and better managing of intermittency. This past summer we had some very severe storms across the Twin Cities area. At one point we had 600,000 customers out, but more than 90 percent of them were restored within three days. A decade ago we had a similar storm and our response time wasn't nearly as good. It's the investments and technology that have allowed us to get that much better. But it's also been about managing renewables. Our effort to forecast intermittent resources has saved our customers more than \$30 million dollars. The industry just continues to get better at integrating this new resource.

Yackira: I have a little different point of view. Las Vegas had about 50,000 people in 1950 and we now have about 2.5 million. Much of our grid is new, so we haven't spent a lot of money on grid modernization yet in Southern Nevada. We estimate the O&M savings from smart meter deployment at \$13 to \$15 million a year. That's out of a \$500 million O&M spend for a year – about 3 percent – but it all counts.

More importantly, our relationship with the customer has improved. People are starting to use the tools we've made available to them in many forms – whether on the web or on their iPhone – to find out what's happening with their energy use and their bill. When they reach thresholds that they set, we let them know: "You wanted to spend \$200 this month for electricity. You're at \$150, but there's half a month yet to go. You might want to take steps to avoid a higher bill."

The other piece I mentioned is the 500 kV trunk transmission line we just completed that links our two systems together. This will enable us to meet a pretty aggressive portfolio standard: 25 percent by 2025. We'll be able to meet it less expensively because we have more geothermal power in northern Nevada than we're able to use; with the line, we can now move the excess to serve our customers in southern Nevada. So we can provide more geothermal development for the benefit of the state as a whole and meet the renewable portfolio standard more cost-effectively. I'm proud of what we've done for our customers.

Craver: We've heard about some pretty significant innovations and investments that have helped reduce outages and improved affordability. All of us and our regulators have a bit of a balancing act here – trying to have a really resilient, reliable, and very clean grid, while trying to keep service affordable. How is that dialogue working with your regulators?

Sibert: Our regulators are very engaged by what's happening in the industry, because they see it as an opportunity to improve service levels to our customers. They've been very supportive of efforts we have underway. We try to help them understand the science behind what we're doing as well as the economics, making sure the customers' needs are met and that they're satisfied with the level of service they're getting for the price



Leslie Sibert

they're having to pay.

Silagy: Like Leslie, I've found our regulators to be excited about new technology. Our conversation is a robust one, because our regulators really want to understand the technology and its benefits.

It's incumbent on us to spend time with our major customers and those who represent them in cases before the public service commission. A lot of our large customers are very focused on their own quarterly earnings, so they're often not keen us making investments that may have a payback period longer than six months or a year. So it's important for us to have conversations with them as to the short-term and long-term benefits from these types of investments.

Regulators are excited about new technology because they really want to understand the technology and its benefits. It's incumbent on utilities to spend time with their regulators and major customers.

With issues like smart grid technology and grid resiliency, that's a bit easier. But sometimes it's a more difficult conversation if we're proposing to invest in new high efficiency generation, for example. We have gone before our commission many times asking for permission to tear down an old oil plant and build a modern gas-fired plant. And I have yet to have one of the interveners stand up and say, "That's a great idea." In fact they've fought it every single time. They are the recipients of lower bills today because of those investments, and that's easy to demonstrate. But it's still a difficult conversation because our perspective, as utilities, is a longer-term one compared with most of our customers.

Sparby: I'm very much in agreement. I think the initial, important conversation is with the customer. Customers need to know that there are many op-

tions – that we offer a wide range of energy efficiency programs that can be very beneficial. It's important that they hear this from us and that we not depend on the media and others to take our story to our customers.

Yackira: When I got to what is now NV Energy 11 years ago, I found a company that didn't communicate with its regulators. It didn't communicate with its customers. It didn't communicate with the legislature. And it didn't communicate with Wall Street, although it was in financial distress. Was it cause and effect? I'll never know, because I wasn't there when these breakdowns of communication happened. But as with any relationship, if you're not communicating, there's always confusion about what's going on.

Craver: Is that the problem I've been having? [LAUGHTER]

Yackira: It's not rocket science. It was a matter of first talking with our customers and saying, "Here's what the problem is, and here's what we're trying to do to solve it." Then going to the regulator – before we made any filings – and saying, "Here's what our customers are saying. They're supportive of this, and here's what we think the outcome will be." As it turned out, over a period of six years we went from owning 3,000 MW to over 6,000 MW of generation. There was, at first, great upward pressure on general rates, but great downward pressure on fuel and purchased power costs. The endgame was a flat price and more reliability. NV Energy had the highest reliability in the U.S. by our last assessment. Large customers have had the chance to leave our system and they haven't left. That, to me, says it all.

Craver: We'll start mixing it up a bit now. Dave Sparby, Xcel's involved in a number of states. Many of those have been at the forefront of renewables and

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involved with distributed generation, as well as utility-scale renewables. What special challenges have you found in trying to integrate a much more variable generating resource into your system. And what role has your investment in the grid played in helping to integrate those more variable resources?

Sparby: The first challenge has been getting the pricing right. Too many times there have been efforts both to meet policy goals and to establish economic costs in the same proceeding. As a result, transparency becomes blurred. It's incumbent on us to send the right price signals. And we need to get out and educate the public and regulators as to the real economic impact of these resources.

Silagy: I agree completely. Florida Power and Light is part of the family of NextEra Energy. Our sister company, NextEra Energy Resources, is the largest producer of electricity from wind and solar in the United States. We've invested a lot of money in the renewables business over 20 years. In Florida we've built more solar than anybody in the state by far. We love renewables. But we really like smart renewables, economic renewables. And you'll notice, if you go around Florida, that even though the company with more installed wind turbines in the U.S. than anybody is headquartered there, there's not a single wind turbine in Florida. That's because it doesn't make economic sense to do wind there on an economic scale – and you have to really do it to scale for it to make sense.

There are 55 electric providers in the state of Florida. FPL offers the lowest bill of all 55. The highest bill in the state is from a municipal. Unfortunately, a few years ago, with the best intentions, that utility decided to make a big push into renewable energy. They went down the path of feed-in tariffs for solar and contracts for biomass. Unfortunately, now they have the

highest bills in the state, and they're locked into these costs for a while. It's not that renewables are bad or fossil is good, or vice versa. It's that you have to really assess the best application for the right spot and then have that dialogue with all of your constituents.

And, to Michael Yackira's point: Whether it's regulators, legislators, customers, first listen to what they want. But also have an honest conversation about what are the realistic benefits and costs. I worry that folks who are served by that high-cost municipal may be turned off to renewables for years to come because they'll be paying very high bills for a while.

Craver: I am curious. In some of your states – Georgia, for example – are you seeing much of a push for distributed generation and net energy metering?

Sibert: We are. In Georgia we have one of the largest voluntary solar programs in place today – 210 MW by 2016 and that's been expanded now by an additional 525 MW, which includes both utility scale and distributed. Our commission is very much aware of not putting upward pressure on rates, so this solar has to be competitive with current generation sources. Obviously we support a full portfolio of options. We say publicly that we look for a balanced portfolio. We've grown as a gas consumer, being now the third largest consumer of natural gas in the U.S. We've gone from gas making up about 14 percent of our fuel mix in 2008 to approximately 42 percent in 2013. So we're very much engaged in making sure that all sources of generation are part of our portfolio.

Craver: Michael Yackira, you know that in our great state of California, we have a pretty good-sized debate going on about the long term. Will we have large central station generation, even in the renewables space? Will there be utility scale – say 200 MW or 300 MW solar farms – in the deserts? Or will solar show up more in the form of distributed generation in the distribution system itself? Are you seeing much of that debate – utility-scale solar versus DG as the future? If so, what do you think?

Yackira: I was the President of FPL Energy when we started growing the wind and solar business, so I'm familiar with renewable energy and its pluses and minuses. What we've seen in Nevada is something of a policy debate. What is the reason for having a portfolio standard in the first place? Is it to create markets for these resources? Is it to reduce fossil fuel consumption and improve the environment? Or is it to give customers options?

Say that a customer wants to put solar PV on his roof, irrespective of the economics. We have some wealthy people in our state who may want to be seen as more "green" – that's fine. It may be the least cost-effective way of producing green energy, but if that's what they want to do we should offer that as an option.

But shouldn't we also have the ability to carve out a piece of one of our central station generating plants, or a combination of plants, for example, and tell a customer, "If you want a contract for energy from the John Jones Solar Plant, we can provide it to you, and here's the price." The customer wouldn't have to lay out capital to do it. If they wanted a lease, we could do that for them. We believe we should offer options to our customers rather than having only third parties come in and – to use a fancy word – disintermediate our customer from us, and then have the confusion and the debate about pulling the plug on the grid – and whether that's even practical. We're going through that debate. We faced it in our last legislative session about a year ago, when distributed generation groups were lobbying in Nevada. We have attempted to level the playing field without being accused of being negative toward DG, because as a technology, we are not negative. But, at the end of the day, the business model of DG doesn't stand up without utility infrastructure. It simply doesn't work without the existing grid. People don't want to be in



Michael Yackira



From left: Ted Craver, Leslie Sibert, Eric Silagy, David Sparby, & Michael Yackira

the dark when it's nighttime or when it's cloudy. Especially when it's 115 degrees in Las Vegas, as you can imagine.

Silagy: But it's a dry heat.

Yackira: Yes, it's a dry heat. [LAUGHTER] But it's heat like you've never experienced. I'm off topic, of course, but the debate is coming to Nevada. We have been very good at describing the issues to our regulators and legislators and we have agreement on this issue with our state consumer advocate.

Sibert: It will become a societal debate, because the technology of distributed generation is going to get there. People will be able to afford to do this. But I think it's going to be a world of haves and have-nots. Those who can afford it will implement renewables, but then the have-nots may be left with the stranded assets to deal with. It's something of a regulatory dilemma.

Yackira: I like thinking about extremes. We talked about this with smart meters. We had a big debate about customers opting out. There was no credible science behind peoples' fears, which the regulators agreed with. There was also no economic reason for customers to opt out, but customers were given the option to do so. So I said, okay, let's suppose 15 customers in a state of 2.5 million say, "I don't want a smart meter." Are they really going to have to pay the price for keeping a meter reading force? Of course not. But it's the same kind of thing. Who really will be

left to pay the bill when some customers make decisions that impact other customers? We must inform the debate and present the facts to our regulators, our legislators, and our customers.

Craver: We've got a great audience here, so this is audience participation time.

Audience Member: I have a question that came up in the earlier panel: Should you be active in offering services on your customers' side of the meter? Are you in trouble if you don't do that – if you don't embrace social media and those things? Or are you better off stopping at the meter and just delivering the power to customers?

Yackira: I see those as two separate questions. Social media has to be part of our mission for a variety of reasons. One, it's a cheap way for us to get our message out. Second, if we look at the demographics, for younger folks, social media and direct contact through their smart phones are their preferred forms of communication. We have to do that, and I think we're seeing more and more of that in the industry.

On your main point, we've been down the road of providing energy services before. Even before I got to FPL, they were selling refrigerators. I'm not suggesting that it isn't something we should look at, but my belief is that energy services are going to take more the form of allowing our customer to be able to utilize the intelligence that's in their home to manage their energy. So they could say, this month I can only afford to pay \$150. Smart technology can help them make that adjustment. If we can provide an avenue for customers to do that, that would be a real achievement.

Sparby: I think over the long run we will provide the platform – the grid – and energy service providers and others will provide the applications.

Silagy: Delivering power to the meter is the fundamental building block of the service we must be good at providing. We may want to do other things, but I come back to Michael's point: you have to know what



you're good at, and what you're not. Helping customers manage their energy use – that's an area we're familiar with and can do. This also gets into to the whole trust issue on data and security: What does the customer really want you to know? We had customer service hearings a year and a half ago, and I was reminded about how security is an issue for customers when a very sweet lady came up to me and said, "You know, young man, I don't want a smart meter in my house because I don't want you to know how much electricity I'm using." [LAUGHTER]

Sibert: Utilities have the relationship and the brand familiarity with the customer. It could be that we'll see utilities partner with others to offer added services that customers want.

Audience Member: I'm Steve Nadel, American Council for an Energy-Efficient Economy. There's been a lot of discussion about the role of distributed generation, but I didn't hear very much about the role of energy efficiency. I was wondering what each one of you think about the role of the utility in helping to provide energy efficiency services going forward. Is it part of the regulated business or part of the unregulated business?

Sibert: I think we'll continue to have energy efficiency and other demand-side management programs offered by utilities as they are today. But with the technology that we're deploying we can offer more rate options to our customers – for example, we could incent customers to use power during off-peak periods with time-of-use rates. As for other technologies and innovation, I think that's going to happen on its own. Utilities should be engaged from an R & D perspective.

Sparby: Energy efficiency will continue for us because it's a big part of what we do. We've been saving about 1.5 percent of energy every year at our North-

ern States Power subsidiary. Data analytics are getting better, and we're getting much more efficient at targeting programs and working with others.

Silagy: I agree. Energy efficiency is a key component of our business. Our demand-side management program is huge for us. We have over a million meters – over 20 percent of our customers – on demand-side management. We've avoided having to build 14 medium-sized power plants with these programs, so that's resulted in a lot of savings for customers over

the years. But you also have to be smart about what programs should be adopted. There are programs that might sound terrific, but some could drive up costs for customers. A refrigerator program that was implemented a couple of years back comes to mind. The idea was to get your old

refrigerator out of your house and replace it with a new, energy efficient refrigerator. What we found was that the old inefficient refrigerator often ended up in the garage and became a beer fridge. So while this may provide increased consumer welfare it could also increase load.

Building codes are probably one of the most effective drivers of energy efficiency. In Florida that's been a big factor. Codes mean better insulation or maybe requiring a higher efficiency air-conditioner. Those changes have been the big drivers for energy efficiency – good programs that people can take advantage of without unnecessarily driving up price.

Craver: Thank you all! It's been a great pleasure being with these excellent panelists. I think they've covered a lot of territory and done a terrific job. □

Delivering power to the meter is the fundamental building block of the service we must be good at providing. We may want to do other things, but you have to know what you're good at, and what you're not.

About the Institute for Electric Innovation

The Edison Foundation Institute for Electric Innovation (IEI) focuses on advancing the adoption and application of new technologies that will strengthen and transform the power grid. IEI's members are the investor-owned electric utilities that represent about 70 percent of the U.S. electric power industry. IEI's membership is committed to an affordable, reliable, secure, and clean energy future.

IEI promotes the sharing of information, ideas, and experiences among regulators, policymakers, technology companies, thought leaders, and the electric power industry. IEI also identifies policies that support the business case for the adoption of cost-effective technologies.

IEI is governed by a Management Committee of electric industry Chief Executive Officers. IEI has a permanent Advisory Committee of leaders from the regulatory community, federal and state government agencies, and other informed stakeholder groups. In addition, IEI has a Strategy Committee made up of senior electric industry executives and more than 30 smart grid technology company partners.

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The Edison Foundation is a 501(c)(3) charitable organization dedicated to bringing the benefits of electricity to families, businesses, and industries worldwide. Furthering Thomas Alva Edison's spirit of invention, the Foundation works to encourage a greater understanding of the production, delivery, and use of electric power to foster economic progress; to ensure a safe and clean environment; and to improve the quality of life for all people. The Edison Foundation provides knowledge, insight, and leadership to achieve its goals through research, conferences, grants, and other outreach activities.

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