

# powering the people

next generation utility

## ENSURING AN AFFORDABLE, RELIABLE, SECURE, AND CLEAN ENERGY FUTURE

A Powering the People Colloquy  
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*The Edison Foundation*

INSTITUTE for  
ELECTRIC INNOVATION



# Ensuring an Affordable, Reliable, Secure, and Clean Energy Future

**Moderator: David Cash**, Commissioner, Massachusetts Department of Public Utilities

**Panelists: Susan Ackerman**, Co-Vice Chair, NARUC Committee on Electricity, Chair, Oregon Public Utility Commission

**Betty Ann Kane**, Chairman, Public Service Commission of the District of Columbia

**Robert Kenney**, Chair, NARUC Committee on Energy Resources and the Environment, Chairman, Missouri Public Service Commission

**Ellen Nowak**, Commissioner, Wisconsin Public Service Commission

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**David Cash:** The context for this discussion was set really well by the previous panels on changing technology and the future of the grid. I want to compliment the Edison Foundation for its efforts here, because they have provided a pretty amazing opportunity for this very timely conversation. Questions about what's happening in the energy industry right now are front and center with all of us.

I also want to acknowledge the place where EEI has come from. It was about a year or so ago that EEI's disruptive technology report came out. Actually, I would have named it something like "The Opportunity-Rich Technology Report." [LAUGHTER]

That EEI report framed major concerns and problems on the utility side flowing from the kind of innovations that are happening in the industry. I think all of us believe that the utilities will play a major role as the future unfolds. Part of that future is about new opportunities that consumers have, whether it's in distributed generation, storage, or information. Given that focus on how

consumers are also going to be empowered, I think this program actually may be misnamed. It should be called "Peopling the Power."

I'm going to start with the first question, and it's one that Ted Craver raised. He said that utilities and regulators have a difficult balancing act: Emerging requirements – demands for greater reliability, integrating renewables and other distributed generation – are being asked of utilities. Some have said that regulators are excited about this future. So my first question is, are you excited? Are you excited about this challenge that we're all dealing with?



*David Cash*

**Susan Ackerman:** Speaking for Oregon, yes. There's no better time to be involved in this industry.

**Betty Ann Kane:** We're very excited. I thought we had gone through our excitement 15 years ago when we restructured and our companies had to sell off their power plants and become distribution companies. Well, that was nothing compared to what we're looking at now in terms of the potential options for the consumer, the role of technology. How do you do all this while keeping a system going, when you have to reach out and bring in so many more players? There are so many more pieces, some of which are regulated and some of which aren't.

*This colloquy is an edited version of a panel discussion featured at The Edison Foundation's **Powering the People: Next Generation Utility** conference, held in Washington, D.C., March 6, 2014. We thank Robert Marritz for his work editing this print edition.*

**Robert Kenney:** Yes, I'm excited. I'm excited about the opportunity for new technologies to be deployed. I get really excited, not only about the things that are customer-facing; I get excited by synchrophasors and phasor measurement units.

**Cash:** Is that exciting conversation, say at a party?

**Kenney:** Yes! I like to say "synchrophasors" a lot. But also because that's where we're going to see real value, I think – often in things consumers don't see. So I'm excited about these new technologies and what they will make possible and mean for consumers. I'm also excited about it because it makes our job interesting. I am excited about the complexity of the challenges that we face and the creative problem solving that we'll have to bring to bear to meet those challenges.

**Ellen Nowak:** Synchrophasors! And I thought I was a nerd. I came into this industry two and a half years ago and I am continually amazed by the continual learning we have to do. I'm excited that we're talking about it. Not to be a buzz kill, but I'm a little worried too. Because if we don't get some of the rules right now, before some of the opportunities we're talking about come to fruition, I think we'll regret that.

**Cash:** Let's follow up with that – being excited and somewhat worried. I think we all probably share that duality. How are each of you in your commissions balancing those issues – coming up with the right rules so that in the future we don't find ourselves in trouble? What process are you going through? What decisions are you



*Ellen Nowak*

making? What criteria are you using to address these kinds of tradeoffs?

**Nowak:** Let me use distributed generation as an example. We're having a discussion about DG at our Wisconsin Commission. We have six investor-owned utilities. Five of them are in this year for a rate case, so this is an opportunity. It will

be a horrible fall for me, personally – I'll have to get my Christmas shopping done early. But I've been telling our utilities, please come in with ideas on how to address these issues.

It's a wonderful thing to have the customers engaged with distributed generation and have a two-way system,

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**It's wonderful to have customers engaged with DG and have a two-way system, but if you don't have an honest discussion about the fact that DG customers are using the grid and its services, and what the costs are, you aren't getting anywhere.**

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but if you don't have an honest discussion about the fact that DGs customers are using the grid and its services, and what those costs are, you aren't getting anywhere. You need to know what DG customers are using from the system as well what they're as putting into it. If we don't take care of this now, while that customer group is still relatively small, we'll have a bigger problem later. So I say to all parties, please come in with some ideas that fairly identify the costs of service to the cost causer.

**Kenney:** The issues surrounding wide-scale deployment of DG – we haven't really been hit with that in Missouri yet. We do have a net metering and easy connection act that was passed in 2007. To a certain degree that statute helped us alleviate some of the discussion that we're having now because we don't compensate customer generators at a full retail rate, but at an avoided fuel cost rate. And so to a degree, the statute was written in such a way that it anticipated potential cost shifting. But I will tell you that we have an energy efficiency investment act and that has been a challenge. How do you ask a utility in a vertically-integrated state to spend money to encourage consumers to use less of their product?

**Cash:** Let's hold off on the answer to that to a later question.



Betty Ann Kane

**Kane:** It's the same question whether you're vertically-integrated or restructured. How do you make sure the distribution system is paid for? But – to get back to the “excited” question – I'm excited about dealing with reliability.

In our entire Northeast and Mid-Atlantic area we've had a lot of storms and major outages, and we've come up with

a whole new way of planning. We're working with new partners – with our city government, our city department of transportation, our investor-owned utility, and our people's counsel. We've all come together to pass legislation for a whole new approach to financing and managing system additions, including putting a significant portion of our distribution system underground. We have a new kind of partnership with the D.C. Department of Transportation. They will be doing some of the construction and will be using some federal highway money. When we started 18 months ago and looked at each other around the table we thought we'd never reach agreement. Now we have a billion dollar, seven-year program that will have minimal negative cost impact on the consumer. I think it's time to start thinking not only about what you're delivering, but who you're working with, and who needs to be pulled in. The public is still paying most of the cost.

But close to half of it will be paid for either by highway funds, which is not ratepayer money but taxpayer money. A very large chunk of it will be financed by bonds that are securitized by the city, and at a much lower rate. And because the city will be doing the construction, there will not be as much profit.

**Ackerman:** I'll just use as an

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example Smart Grid. You want your utilities to be innovative, you want them to be creative and take risks, but they have to be prudent risks. That never changes. Something like smart grid – it's almost an old issue at this point because we expect utilities to do it. But we still expect them to make a business case for it. We will stretch the cost-benefit test, we'll look at all kinds of benefits, we'll do what we can to be flexible about it. But they still have to demonstrate how an investment saves costs, improves service, and benefits the customer in the long run. By and large they have been able to do that [in Oregon].

**Cash:** I want to stop here and do some Q & A. After each general question I ask, if there's a question or comment from the audience on that particular topic, now's your chance.

Utilities in the last panel, and the tech companies in the prior panel, talked about the importance of communicating – with stakeholders, with regulators, with community, with consumers, et cetera. Here's the question: What role should the regulator play in communicating with these same stakeholders?

**Ackerman:** We have a traditional vertically-integrated utility structure in Oregon and we are great believers in the integrated resource planning process. Part of that process is a very robust stakeholder communication process. A lot of the decisions that utilities make get vetted in that IRP process, but everyone's there – the

consumer interests, the commission staff, environmental interests, anybody who's got anything to say. So by the time they've developed a plan, everyone is more or less on the same page. They may not always agree, but they know what's going on. It makes our job a lot easier.

The direct consumer communication that I think needs to come from us is probably in

our rate design. I don't believe consumers understand how the system is paid for, probably because we send them price signals that aren't that helpful. That's something we could do better.

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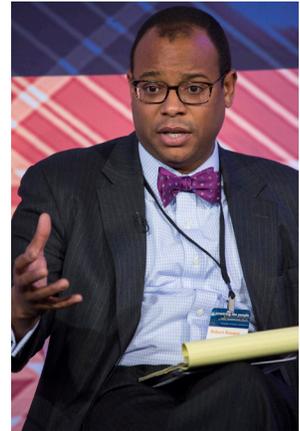
**Kane:** In a restructured environment I think for us, and for most of the Mid-Atlantic states, we've really shifted an awful lot of decision making to the consumer. So I think we as regulators have a very important role in "educating the consumers" – helping them understand what choices they have and what things to consider – in who they buy their electricity from, as well as for their gas and telecom. We need to make clear what our role is and what our role isn't; what we can protect them from, and what we can give them information about. But the ultimate responsibility rests with the customer. It's a big change.

**Cash:** What does that kind of communication outreach look like?

**Kane:** Well, we've got our website and an online calculator. You can put in your usage and put in the rates that the various companies are offering. It's a big challenge, a whole different relationship with these retailers, these marketers that we license; but we don't regulate their price. We can inform consumers about their price, and we have consumer protection rules and protections like the consumer's right to cancel a contract and requiring a written contract.

**If you're compensating net metering at a full retail rate but you're contemplating changing that, you owe it to consumers to explain why, and to explain to them that their retail rate contains all of these different components.**

Policing all of that is a very different role. You have to continually communicate with consumers and get them to understand the difference between the distribution company and the company they're buying their electricity from – that they might not be the same company. But for most of our residential consumers, it is still the same company, since most of them haven't chosen to sign up with an alternative supplier.



*Robert Kenney*

**Kenney:** I think the state commissions have a unique role to play because we represent the public interest. We don't have a pecuniary financial interest – at least a self-directed pecuniary interest. I think that adds a level of credibility to what we say. In Missouri we've taken it upon ourselves to reach out to chambers of commerce and civic organizations around the state. We offer to do presentations to them on the commission and Public Utility Regulation 101. We started with chambers and civic organizations because those are typically leaders in their communities. They can be evangelists for your message.

If you are in a state where you're compensating net metering at a full retail rate but you're contemplating changing that, you owe it to consumers to explain why, and to explain to them that their retail rate includes all of these different components. If you're changing settled expectations and want consumers to behave differently and consume energy differently, they need to understand why they should. It requires a very affirmative, proactive approach to reach out to the consumers and to go out there and interact with them.

**Nowak:** I absolutely agree. We have a very big role, and



*Susan Ackerman*

I think we need to add credibility to the issue. I have two speaking engagements this month before community groups, telling people what we do. People want to know why their bills keep going up. They blame regulators. They need to know about the impact of EPA regulations. We have a lot of discretion, but a lot of what we do involves

costs we're required to pass on to consumers – we have no discretion there.

Utility customers may also want to know the costs and benefits of having their own generation. Will costs outweigh the benefits? With AMI, there was a lot of misinformation. We had calls to our offices – people worried that smart meters will cause health issues. So we had to explain that they've already had them installed for a while.

We do such a good job of talking to each other at our own conferences that we can get caught up in our lingo and acronyms. We have to drop that when we go out and talk to our legislators and to the public. People probably don't spend more than 30 seconds a month thinking about their energy bill. But they will come talk to you when it keeps going up.

**Audience Member:** What are your expectations, commissioners, as to how utilities communicate and educate the public? What could regulators do more? Could they do a better job of educating the public about what they're doing and its value?

**Cash:** And should you require them to do more?

**Kenney:** This is an opportunity for state commissions to work cooperatively with their regulated utilities outside of an adversarial process. We typically encounter utilities in a hearing room during an adversarial process, or at a local public hearing that's an adjunct to an adversarial process.

In Missouri, we instituted something we called “utility days”; we've renamed it and reworked it. It involves bringing utilities together with public counsel and public service commission staff at a community center, say, to educate customers about a variety of different issues. It was in conjunction with some community organizations that were doing education around home heating assistance, but outside the context of a rate case or any adversarial process, even a rule making.

There are lots of opportunities for regulators to interact with their regulated entities outside of the adversarial process – about energy efficiency, about home heating assistance, about weatherization. There are many community forums that you can insinuate yourself into, and regulators can invite electric and gas utilities and others to join in that process.

**Nowak:** Utilities can also ask commissioners to come speak to some of their different customer groups. It's a great opportunity – again, outside the adversarial process.

**Kane:** I agree that there are ways to do education together, even within the regulatory context. For example in our utility discount programs we have a working group that includes agency staff and utility staff. They sit down and talk about what kind of consumer material we put out – like a joint flyer that lists all the discounts, or telling people about energy efficiency opportunities, or even redoing the bill format.

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**Cash:** There's been a lot of talk in the last year or so about a “death spiral” for utilities. My question is, do you think that the death spiral is real? Why? Why not?

**Ackerman:** I don't think it's real. I don't think it's in my lifetime. About the remark the gentleman from IBM made earlier about how everyone used to think the mainframe computer would never be obsolete: I get his point, but I don't see how distributed generation can function without the grid. The grid's always going to be there. It needs to be maintained and it needs to be healthy.

I'm not sure when battery technology finally catches up. I suppose there could be a future where some people actually disconnect from the grid, relying on batteries and solar panels. But I think that's going to be limited to certain parts of the country, not widespread. And I don't expect utilities will be in a death spiral. Also, we're not without regulatory tools. There are all sorts of rate design steps we can take. Incentive mechanisms – all sorts of things can be done that will allow the utility to be compensated justly for its investments and kept whole. I think that'll happen.

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**Kane:** You're always going to need infrastructure. I think there will be a lot of change, particularly on the generation side.

**Cash:** But answer the question. Death spiral: yes or no?

**Kane:** No. You're always going to need infrastructure. Somebody's got to be in charge of it, somebody's got to interconnect it. Somebody's got to be sure that it's all working together. I think there are things that utilities will let go of, or have to let go of, or [it will] be taken away by the customers. But maybe more on the supply

side, more on inside-the-home things – equipment, bells and whistles. But there will always be a need for that basic infrastructure and for its coordination. You don't want to see cities with four different sets of distribution lines running down the street. That's how we started.

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**Kenney:** N. O. No. But I have a couple of observations about this. I have found that we like to use really hyperbolic language, like “death spiral,” and “train wreck,” and “big data,” and “disruptive technologies.” We like to use loaded phrases that draw attention to specific issues. So we use the phrase death spiral, and now it's got us talking about it.

The types of technologies we're seeing may, in fact, cause utilities to pursue different revenue streams. I look at gas companies that sell gas, but they also sell hot water heaters and provide other services. We have affiliate transaction rules that insure that the costs and activities between a non-regulated entity and a regulated entity are appropriate. We're entering an era in which we are having to think radically differently, but I don't think it's going to kill the regulatory model and I don't think it will necessarily kill the utility business model. It will require us to think differently, and creatively, and to employ tools I believe we already have.

**Nowak:** It's not a death spiral, but it is a wake-up call to us, the regulators, to the industry, to consumers. Things are going to be changing. It happens in every industry. We're going to need to sit down and have some possibly difficult conversations. People need to understand the true cost of everything.

**Cash:** So, let it be said that from this point on, we expect not to see “death spiral” in the trade press, in media gen-



erally. [LAUGHTER] The death spiral is officially dead. Okay?

There's been a conversation about what happens inside the house, behind the meter. Is that a space that utilities should play in? Or is that a space for third party providers, innovators. How do we think about that from a regulatory perspective?

**Kane:** Remember when the only phone you could get was the one the telephone company gave you? We're not going to go back to that. I think what's inside the home is a free-for-all. There are a lot of potential providers. There may be concerns about how you connect everything. But, you know, they used to claim that if you didn't use the phone that AT&T gave you the whole system would blow up. I think that issue is settled. Things like sharing information using smart meters, connecting the meters to your smart inside equipment, paying your bill – it's already happening. I can pay my Pepco bill on my iPhone. I can track my daughter's use, because she lives in a house I own that I'm renting to her. [LAUGHTER] That is so much that's already an unregulated industry that a utility, aside from where there is an affiliate and a wall between the utility and the affiliate, should not and will not be in that business.

**Kenney:** I think it's up to the utilities. One utility CEO said, "That's not our skill set. I'm not going to do that." But then others say "I'm not giving up my customers – over my dead body." So I think this will reflect the thinking of the utilities' leadership.

A utility may have an unregulated entity that wants to provide services inside the house. I say, go for it. We'll deal with affiliate transaction rules if that comes up, and cost allocation, as we've done before. It seems like it could make sense for a utility to get involved behind the meter, if all of these other public policies are requiring them to look for other revenue streams. Why wouldn't they think about doing it?

**Cash:** But wouldn't that give an unfair advantage to the utilities? The third parties, new startups, the green innovation folks may not find a level playing field because they don't have access to the customers.

**Kenney:** I think what we're seeing would belie that. Non-utility-affiliated entities are involved in that now and they're doing fine. They should have access to the data they need. The utility may have an advantage because it has a preexisting relationship with the customer, but it shouldn't have an information advantage.

**Nowak:** I think what Robert is saying is OK, as long as the regulated entity isn't getting an unfair advantage in the competitive market. We had a similar situation in Wisconsin with compressed natural gas. As long as there are clear lines between the regulated entity and non-regulated affiliates, the non-regulated affiliates are free to compete. But we need to be careful to have the regulated stay in its lane and do its business.

**Ackerman:** I agree. I don't have a problem with the utility getting in other businesses, as long as we know what responsibilities are what. They're still going to be responsible for keeping the distribution grid operating. The stuff inside the home? I wouldn't say they couldn't get into it, but I'd like to see a business plan – something like that. There would need to be separation of functions, walls, rules – things like that.

**Audience Member:** I have a question about security. A previous speaker said when he walks by his Nest thermostat at home someone knows how long his baths are and how often he washes his clothes. Are these things you think people want their utilities to know or would they prefer that Google handle it?

**Cash:** Let's take this quickly.

**Kane:** It's up to the customer. Customers own the data. They have the right to say who gets access to it. As long as you've got good rules and laws in place about who can share that data with what kind of permission, that's the marketplace.

**Kenney:** Rules are important but educating the consumer is also important. I recall the comment from another panel – the customer who said, "I don't want a smart meter in my home because I don't want the utility knowing how much electricity I use." [LAUGHTER]

That shows a basic lack of understanding.

**Cash:** Quick question here, we're on speed round.

**Audience Member:** There's an assumption in this last question that there's a fundamental dividing line between what's behind the meter and on the other side of it. If you listen to the technology guys, that line doesn't exist. Also, we talk about smart appliances and such, but some people can afford that and other people may not be able to. A utility may have significant costs in infrastructure that have to be socialized within rate classes, but the benefits are not socialized. How do you think about that from a regulatory perspective?

**Kenney:** What's going to be socialized? The guy that buys a Nest meter is paying for that. And if I buy smart appliances, I'm paying for that.

**Ackerman:** I could see one advantage to having the utility behind the meter in the home. That might be to automate and streamline some of the energy efficiency programs, for example. If you can integrate a program with the thermostat and the appliances talking to the grid and it can reduce consumption overall, or shift consumption away from costly time periods, that to me would be a good energy efficiency program. So I wouldn't rule out the idea that a utility could invest in that and recover its cost. But it comes back to the business case: should all the utility's customers pay for that?

**Cash:** I'm going to jump out of moderator role into panelist role for a second. In Massachusetts the energy efficiency and solar programs are designed so that there isn't great disparity across income classes. People may be surprised to find that in Massachusetts the percentage of low income homes that have PV is commensurate with the percentage of low income families overall. Likewise, as to the middle and high income. This is not a high-income luxury thing that people are doing in Massachusetts.

**Cash:** A question: Absent a decoupling program, the utility loses revenues with energy efficiency. Yet energy efficiency has been identified as our cheapest resource –



*From left: David Cash, Susan Ackerman, Betty Ann Kane, Robert Kenney, Ellen Nowak*

with big cost savings for customers, big cost savings for grid infrastructure. In New England we have avoided \$200 million to \$300 million of transmission projects because of our energy efficiency programs. The question is, how hard should we be pushing utilities on this, and if so how do we do that?

**Ackerman:** We should be pushing utilities hard on energy efficiency. You can look at a supply curve and see why. Energy efficiency is still our cheapest resource, by a country mile. It does put the utility in an awkward spot because they will tend to lose revenue, but that's why you do things like decoupling. Or you change rate designs so you recover more fixed charges in the bill. There are all sorts of ways of addressing that.

**Kane:** You have a responsibility to be sure that your fixed costs don't vary by consumption and are recovered in a fair and equitable way. Actually in the District, our authority over energy efficiency has been superseded by a sustainable energy utility like Efficiency Vermont. It runs the energy efficiency programs. The DC Commission sits on the board as an advisory member. An earlier panelist said that the best energy efficiency program is a good building code and I'd agree with that.

**Kenney:** Missouri has an energy efficiency investment act that sets forth the policy of the state and requires the Commission to value investments in cost effective energy efficiency on a par with supply side investments. We were charged with drafting rules to implement that statute. Our rules allow for recovery of lost revenues,



which I thought was actually troubling for a number of reasons; decoupling might have been a more elegant way to deal with it. But our utilities came to a solution that was the product of a stakeholder-driven process under which they get to recover the costs associated with administering the programs and they can set up a regulatory asset to earn on it as well. As an incentive, they are able to keep a portion of the net-shared benefits commensurate with targets that they've achieved. That's all set forth in the proposal. It seems counter-intuitive to ask the widget maker to sell less widgets, but we have regulatory tools to address that issue.

**Nowak:** Wisconsin law requires utilities to contribute 1.2 percent of their revenues into a statewide energy efficiency program. It's a public benefit program like the DC program, and Efficiency Vermont, and Oregon's. It's overseen by the Commission. I'm always asking if we're getting enough out of the program, because there are a lot of administrative burdens that come with it. We're seeing utilities with very flat load growth and efficiency programs take these revenues away from them. It's a struggle.

**Cash:** Massachusetts has done something similar to Missouri, except that we've done decoupling and made it part and parcel of the business model of our utilities. The utilities deliver the service. We spend about a billion dollars a year on energy efficiency and recover about \$6 billion in savings, over time. And, for the last few years, we've actually surpassed California as number one in energy efficiency. I'm required to say that by contract. [LAUGHTER]

**Kane:** There's another aspect that we're kind of overlooking, in at least in some of our states – that's organized markets, wholesale markets. And we haven't touched on the role of merchant generators. Or, particularly within PJM, the large impact of demand response. There are

important aspects of efficiency that are outside the control of any state regulator.

**Audience Member:** This is a two-part question. My name is Shelley Fidler. I'm with Van Ness Feldman and I would like to ask you wonderful regulators about your view of the utility of the future, if you put it through the section 111(d) Clean Air Act filter. Second, please include in your answer, how we can encourage energy efficiency to help utilities afford compliance.

**Nowak:** Back in December, we filed comments with EPA jointly with our Department of Natural Resources. One of the things we told EPA is that we have programs in the state – in our renewable portfolio standard and statewide energy efficiency program – that produce

real savings in carbon emissions. So please, we said, let that count toward compliance with 111(d). We're hoping to be able to count those resources, because other ways to deal with 111(d) are more costly.

**Kenney:** Under 111(d) each state is required to draft its own state implementation plan, so as a threshold matter it's going to vary from state to

state, as it should. We filed similar comments asking the EPA to be mindful of the fact that we have an Energy Efficiency Investment Act that's reducing emissions, and we have a renewable portfolio standard with which our utilities are trying to comply that will also have the effect of reducing emissions.

Missouri is in a unique position: 80 percent of our generation is coal-fired, so we have a significant concern about regulations that could adversely impact reliability. We're trying to inform the debate at EPA, and in part through NARUC, as well as individually. I'm sure all the states are filing comments hoping to make things clear so that EPA understands the unique position that each state is in and what we're all already doing.

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**Cash:** Great question. We have about two minutes left, so here's my surprise question for the panelists. Let's say in 20 years you're retired and you're on a panel of retired commissioners at a meeting. You're asked what you did – what decision did your commission make 20 years ago – to bring us to the smart, modern grid that we will have 20 years hence?

**Nowak:** Getting the rates right – having rates accurately reflect costs.

**Kenney:** Two things. First, making sure that we have maximized our community outreach and external affairs – reaching out to civic organizations, the media, and to our general assembly to make sure that those constituencies are well informed. If we can figure out a way to make what we do interesting to those broad constituencies, we will have come a long way.

The second thing is enhancing our participation in regional state organizations with our RTO. Transmission investment, although it's still a relatively small part of the customer's bill, comparatively speaking, is becoming more and more important, particularly as costs increase and we socialize those costs. So, enhancing the roles of state regulators in the MISO footprint would be something I'll say I was proud of.

**Kane:** Putting the right kind of process in place to encourage investment in basic infrastructure that's robust and resilient, with modern electronics, and easily upgradable – something that's flexible for whatever future is going to develop, whether it's microgrids, combined heat and power, etc.

**Cash:** Last word, Susan.

**Ackerman:** Oregon's smart grid order. It required our utilities to plan for smart grid investments and do them as planning requirements indicated. Also, a decision we made two or three years ago, to shut down our only coal plant in the state early instead of making a very large investment in scrubbers to meet regional haze rules.

**Cash:** Thank you. This was an awesome panel. □

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## 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. The 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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## About The Edison Foundation

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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