

**“Visions of the Smart Grid: Deconstructing the
traditional utility to build the virtual utility”**

U.S. Department of Energy
Smart Grid Implementation Workshop

Keynote Address

by

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Thank you and good morning. And thank you, Rich, for the introduction. I am really glad to see such a broad representation. Three or four years ago when we started at CenterPoint Energy down in Houston on the intelligent grid, it was hard to get a conversation with a handful of people about this, and it's really enjoyable to see how the idea has caught on. We continue to move forward rapidly, and it's really good to see so many of the top professionals and leaders around the country answer the request from DOE to come to this workshop. I think you're going to have a wonderful couple of days thinking about this topic, and what I hope to do today is lay out what I think are the challenges for you and the direction that you really need to think about as we proceed forward.

Today's paternalistic utility

We have today the traditional utility – power flows down the line to the house. That's about all we do. And I would offer that today's utility is very paternalistic. The consumer doesn't do much. They consume electricity, they pay a bill, and that's sort of the extent of it because it's a closed system that's been that way for a number of years.

Just a few days ago, I heard a comment that research showed that people aren't interested in the smart grid. They were perfectly happy with the grid set up the way it is. It's paternalistic: they get their bill; they don't have a lot of interest in going forward. And really it struck me – I thought if that's true, why not have one brand of toothpaste, one type of soap, one beer, and it can just be delivered to your house. You can just take the quantity of it you want, and at the end of the month you get a bill and pay for what you take and that'd be just like electricity. What do you need choices for? What do markets do?

I think the conclusion drawn from that statement is exactly backwards: that's what people are used to, it's what they've always had, and there isn't exposure to other choices that are available. When those other choices become available to people, they'll make them and they'll enjoy them as much as they enjoy one brand of beer over another. And people will take their selections based on their own preferences, and that's what markets are about. That is the enabling part of what we're doing, and that is why I think that we are on a path to deconstructing the traditional integrated utility.

I don't think it's any less of a path than that – we are embarking on a path to a virtual utility. You don't have to have the day-to-day billings, the customer choices, connected to the same portion of the grid that delivers the power. Just like some people go home and construct a "Second Life" on the Internet, there's no reason you can't move that second life to your power consumption. What I want to do today is step through how I think that's going to happen.

Remarkable things occur when the economics of certain conditions and available technology come together. This has happened with computers since the 80s as the economics of computers continues to drop and the technical knowledge continues to improve. Look what happens with telephones when the economics and the technology come together and they cause a transformation in the way we do things because those two coming together drive substantial change. And I think that's where we are at this time with electricity.

I'm not here this morning to explain the smart grid to you. You know that. We are trying to come together on some details and definition of it. We all understand what we are doing. What I really want to talk about this morning is to tell you that it's coming. That you in this room need to be the leaders in deciding what is the best way to get to a conclusion so that the whole country benefits the same that we've benefitted from other technology revolutions.

We are going to face a lot of forces here: business, regulatory, economic, environmental, social. When you start changing a paradigm, when it comes to electricity, every sector of our economy is touched. What you are being asked to do you have to think about in very broad terms. I'm asking you to think about where we're headed and the path we need to go down to get there.

A vision of the smart grid

Here's my vision for a smart grid – "to create a digital communication path to enable information flow for the operation and control of the efficient production, transportation, and use of energy." It's broader than electricity. It's not just delivery of electricity. It's the whole energy chain. And it's not just energy. It's information, information people can act on and will act on to change the way that they live their lives.

What I want to talk about is a deconstruction of the traditional integrated utility and evolution toward a virtual utility that we'll do in four steps: smart meters, to an intelligent grid, to distributed generation, to a virtual utility. Let me make an aside – I'm going to focus mainly on the distribution side; there are tremendous benefits that will occur on the transmission side as well. Those tend to be the more technical issues: we want more power on the lines, we want to keep cascades from occurring – those sorts of things. I think the transformational part in terms of the economy occurs at the distribution level, and that's really what I want to talk about.

The other part of this that is very important is that this is in no way sequential. You can start with intelligent grid and build to smart meters, and in fact as you go forward with this in some part, distributed generation will already be out there. It will be a matter of integrating it. You really can't even start with smart meters without some sort of communication, some sort of an Internet operation that allows people to see it. So bits and pieces of this come along. My point is that when you arrive at these together, when the consumer has access to all of them, that's when the significant change starts.

So I'm going to go through these in the sequence that we're going to do them in Houston that has been mandated by the state of Texas, so we'll step through them with smart meters first.

Smart Meters – the first crack in the armor

My company, CenterPoint Energy, is among many utilities which have initiated or are planning smart meter implementation. It's been a very rapid transition from a couple of years ago. Back in probably at least 2005, there were conversations that it just wasn't necessary, that it's not economical, you don't have to go forward.

We built down in Houston with the aid of iTron, and IBM and others, a technology center to proof the concept, to have people come and look at it. We've had over 300 different groups tour this technology center just to look at what's going on down there and how it's happened. It's been a very interesting transformation the last two years. People can visualize the idea and see what's happening, and it really has helped spread the thought of the smart grid in a relatively short period of time.

Last year at the start of 2007, it became acknowledged that the smart grid really is a possibility. What I'm here to tell you today is that it's inevitable. This is where the technology is going to take us. There are some requirements. One is you have to have a two-way communication path between the host and the meter, and in that path, you have to be able to communicate the interval data from the meter, some kind of real-time pricing support, in-home two-way communication, and what I think is critical about that is that pricing and usage information has to be transported to the consumer so that they can see what's occurring in their home. And then some sort of a remote connect/disconnect feature on that meter.

The benefits are that immediately you get tremendous demand response. And that demand response is now driven, that market's created by two factors: one is very high fuel prices, and the second is environmental considerations. This is what is going to drive the consumer to want to look at these issues. We can't look at the historic paradigm and say, "well, they haven't liked it before." There's a lot of incentive to move forward on this. A lot of incentive, I believe, is going to come in the form of legislation. You see an increase in energy efficiency that results in reduced generation needs, and these cost savings justify the infrastructure.

The analysis we've done in the filings in Texas is essentially non-participants as well as participants pay for the system. There is enough value created in the system – we are very heavily gas driven in Texas – stepping down one [generation] unit, which requires a 1 Kva reduction in a home, across the board. Not turning on the froster in a freezer of a home saves about 1 Kva, and the person doesn't even know it happened if you just don't do that on peak. One Kva savings to non-participants causes a unit to be backed down. The differential in energy savings from the least efficient unit to the next best efficient unit by not running that worst unit, that savings in fuel alone pays the infrastructure costs of the unit.

Without even worrying about there being units you don't have to build because you've backed down the demand, and what are gas units going for now about a thousand dollars a Kw, eight hundred dollars a Kw? Whatever the construction costs are, saving three thousand Kws, two and a half billion dollars in the state of Texas alone it saves. The economics are there. It pays for itself very readily. That cost savings, that value creation, is what provides the incentives for this to continue to get built.

So what's the outcome that we roll out some smart meters? This isn't a real big step. Not a lot of change, but there are two significant changes that begin to occur. But little changes in the utility structure. There are economic gains for the utility. There is load smoothing, increased load factors that occur. The bills still go out the same way. The paternalistic operation of the utility is really still there. Nothing much changed day to day. And the energy control is generally handled by the utility.

But the first crack in the armor occurs here because with that in-home device, for the first time the consumer sees what they're consuming as they consume it. They see their bill to date for the month as it's being consumed and a projection of if they keep consuming at that rate what their bill at the end of the month will be. So for the first time they have energy information to act on that they've never had before. And that is the seed that gets planted with the consumer that "maybe I do want to do something about this." And the Olympic Peninsula test that the DOE conducted is very instrumental in pointing out that those savings are very real even with a relatively small amount of information to the consumer, that people will react and that's really the beginning seed that's planted to make this go forward.

The utilities get more efficient operations, those money savings are dollars used to continue the grid enhancement. What I think is important to understand is that this advanced metering system is a disruptive technology, and it leads us down a path of information availability. I don't think you ought to fool yourself into thinking that this is just automated meter reading type 2 that's a little more sophisticated. You're never going to go back once the consumer starts seeing this information to the completely paternalistic way that we have operated utilities in the past.

It is I think the first step in the deconstruction of this grid.

Intelligent Grid – closing the reliability gap

The next step is to move to the intelligent grid. Here we begin to see the ability to have correction. We have this tree that was planted in an unfortunate location next to the power line and it's fallen over the power line, but our grid has been smart enough to route the power around it and continue the operation. What we see out of that is the ability of the consumer to have increasing power quality expectations. Reliability expectations can be met at really relatively small incremental cost once this digital communication path is established, and that becomes the real value of this. Automation will close what gaps remain in terms of reliability and the ability to restore power quickly and effortlessly and provide a lot of operational information to the utility.

There's a real value in this because the benefits that occur out of this move us towards overcoming an aging infrastructure. The less stress that you put on equipment that's very old the longer that equipment will last, and the more information we know about the stress that's being put on that equipment the better we can maintain it. There's a real economic value in that – it's pretty hard to measure what gain you're going to get – but I think there's no question it's there.

It helps us then in that case optimize the life of those electrical assets. It helps offset the decline in the workforce. Everybody nowadays is facing an aging workforce, particularly in our line crews and the ability to know where the outages are and dispatch exactly the right truck with the right people on it. This is a question I asked the other day. I always wondered if our experience was the same as others' – 50 percent of the trouble calls we receive are inside trouble, inside the house or the building. Half the time we roll a truck, the guy doesn't do anything except the kind of pre-check up at the home: "yeah, you need to call an electrician." Eliminating half of our trouble calls through a system like this. The manpower requirements that result from that are pretty significant.

And of course as I said, you continue to see reduced costs. That's the incentive that the utility has to build the system, but that's not what happens because you built the system. What you've done when you've constructed this is you've now put enough intelligence on the grid to enable two-way power flows to take place and understand and manage that.

This is the next step towards the deconstruction of the utility because you've enabled the information flow for people to be able to see specifically what's on the grid where and how it's moving in what direction. Because everybody built their grid for one-way power flow. The whole purpose of a distribution feeder is to run power out to some source. If we start moving to the next step, what we need is the ability to distribute that generation around the system and now keep track of it. So we've got to take a system that was built for one use – same thing's true of the transmission system – and start adapting it for a completely different set of economics. And here's where we get to the next part of real value in this.

So the outcome of the intelligent grid: we're still utility centric. We're still at a point where the utility is doing all this. We're the ones getting the value out of it. There's still savings from operational improvements, improved reliability, outage response, increased automation, extended life of assets. You get, I think, a significant improvement in customer satisfaction. Smart meters are self-reporting in terms of outage. The system becomes self-healing. The number of calls to the service center is reduced that are related to outages and to billing because you know your bill ahead of time, you've watched it accumulate all month, it's not a surprise package that you open each month to see what it's going to be. All of that information greatly impacts how call centers work and the call volume. And it's another real savings.

These two items, the smart meters and the smart grid, become the foundation of this virtual utility. Essentially, all of the significant capital that you need to invest in the system has now been invested. And it's been invested for reasons that are good for the utility, good for the consumer, and return back dollars. What you've done is position the utility in a way now to begin to take this information and move it forward to the next step because we've enabled those two-way power flows to move forward.

Distributed generation – where change begins.

And here's where real change begins. We move to distributed generation. Now we've added sources that begin to allow and encourage consumers to leverage distributed generation and renewable energy sources. Again, not speaking sequentially – these can be out there – what I'm saying is we've arrived at the point where all three of these are available to the consumer, and while distributed generation isn't new, the high price of fuel makes these energy sources much more affordable. While the costs of solar and other choices do continue to come down, what's happened is the base price of electricity has gone up to the price where these start becoming affordable.

Plug-in electrical vehicles, battery storage, micro-grids, wind, fuel cells, geothermal – a lot of options out there are being explored, and as the price of electricity continues to mount, these become more and more economical. So energy management becomes no longer restricted to the utility. Plus greenhouse gas legislation and other incentives will help encourage the use of these alternatives that become mandated by legislation.

Mandates are never a very good way to drive a market because legislation generally isn't going to make the economics work or not. But what they do – and I think of the California mandate of 20 percent renewable by 2017 in terms of their generation – they create markets that tend to drive the general price of the products down. Those mandates can initiate the market. If in fact the market is there, if people use it, if the price response is there, then those markets develop. And I believe if you take any forecast for fuel, even the most bearish ones over the next ten years, those will very much push us toward more people looking to alternatives.

I'm trying to remember what the government of California's mandate was. I think it was on the order of a million solar panels, but with any large number of solar panels like that you have begun to deconstruct the market. You have begun to distribute generation. As plug-in electric vehicles become more common (I think it's probably 2011 when those things start hitting the market in any kind of a volume) when they do, they start affecting people's thought process about how electricity is used and how it can be shared.

This problem from the utility standpoint gets a lot harder because we still have the central stations. You still have all the technical fundamentals, the frequency and voltage that have to be maintained, but now you have a lot of participants out there who want to share in this.

The requirements are driven by the market. We need to address rising consumer costs, the cost of energy. As I said, I don't think it's so much that the price of solar panels comes down as the price of fuel rises to meet it. We have transportation initiatives – plug in vehicles that are coming. We're connecting the distributed generation to the grid, and people start awakening to that possibility.

Here some really interesting benefits start to show up as well. You get the kind of demand response, time-of-day response, environmental benefits and benefits in terms of tax incentives and in terms of sharing.

So what's the outcome? Well, I think high energy prices and environmental awareness awaken consumers that there are alternative energy choices. They start looking around. And the utility-centric paradigm begins to shift to the consumer because the combination of the energy information available through the digital communication begins to empower the consumers. They begin to ask "if I can see my consumption, and I can make my own energy, what else can I do? What other devices are out that enable me to manage what I do and what others do? And if I have a surplus, why do I have to give it back to you, the utility? Why can't I do other things with it?"

Now we begin to deconstruct the traditional utility paradigm. You, of course, have the traditional utility sources. The grid doesn't disappear, but it starts operating in a very different way. You've got to maintain frequency. You've got to maintain voltage, but you've got to do it with a lot of new power sources. And I believe this distributed generation is the culmination of the previous steps that accelerates the empowerment of the consumer, and the paternal nature of the utility begins to come apart.

So we move to the virtual utility. As these pieces develop -- the culmination of the smart meters with in-home communication with an intelligent grid enabling two-way power flows, distributed generation empowering users -- you can easily see how you could construct a parallel virtual world to take advantage of digital communications and the traditional utility services have been deconstructed. The only thing you really need to have out there as a monopoly is the wires. Is the T&D [transmission and distribution] structure itself. The rest of this can be constructed around it. It can converge on the digital world of the Internet.

What I think is important about this is that the utility loses its unilateral control of the system at this point. It's fairly easy to imagine a system where someone can go online and say "look, here's my house on this virtual grid, and I have a solar panel and any time I have extra electricity that my solar panels are making, I want to transfer that extra electricity over to my mother's house and credit it against her bill."

That's not a technical function, that's an accounting leap. If I have someone who's willing to manage that for me, to take care of that accounting, whether it's a utility or not, if that information's available, that type of reference is not very different from sharing a lot of other pieces that occur now on the Internet. I as an aggregator can say "I want to go to different homes, and if you'll sell me the right to control your air conditioning unit, I'll sell in aggregate this as a demand reduction to the utility. I'll take what I get back in terms of payments for that demand reduction, and I'll share them with you."

So I have a corporation that sends people money every month. You get money back as a result of what we sold, and you control how much you want to participate. If you don't want your air conditioner shut off, that's fine. We'll skip this day and move to another one, but in aggregate you'll get a percentage of what you participate in.

I think this is not farfetched at all. I think it's fairly easily done once the system has this much information in it. There become a lot of interactive parts, more players. Already you have many non-traditional players with big pockets moving into this space. You have Honda, Toshiba, Google, Microsoft. I know that Microsoft and Oracle are both members of the GridWise alliance looking at that portion and a lot of other organizations as well. A lot of economic factors are bringing these non-traditional players that are developing products and impacting the business.

It's still the grid. It's still a monopoly, but beyond that grid it's all opened up.

What comes out of this is we have willing participation in the creation of user-friendly Internet solutions. I think that's a main requirement. Consumers must have an easy way to virtualize this. Seamless integration of the system. There must be standards that make that happen and get to plug-and-play compatibility. Consumers then become interactive participants because these options create markets. They create choices for consumers. You have the ability then to power share. The distributed generation can be sent wherever you might choose to use it.

The benefits are the expansion of market-driven energy services. A lot of choices become available. It becomes more efficient to operate your home. A lot of environmental benefits. These benefits are shared across the energy chain among utility and non-utility stakeholders, and consumers gain a better understanding and control of their energy usage whether directly or whether they outsource it. And you have smart homes and smart home networks. I do want to say I think "smart" doesn't mean you have to put a \$15,000 device in a home. A low-income home that has a simple device on the counter showing what the bill is makes that home pretty smart to that consumer.

A device that allows pre-payment for that type of customer has taken them from being one of the worst credit risks on the system to the best credit risk. In Texas, where we've deregulated already they should see a pricing advantage because their risk is lower. So it has that advantage of helping people who may not have enough load to shift to use demand management, but there is still enough value for everyone. Smart is relative to the particular consuming habits.

So the outcome of this stage is the sum of the three preceding stages. We have a deconstruction of that old paradigm. The utility is no longer in sole control of the grid. Consumers choose automated or manual energy management. The market takes over, drives solutions, and those market solutions close the gap of consumer expectations. Here you have deregulation, you have this deconstruction that drives the market, not legislation and mandates.

Back to reality – obstacles are not existential but temporal

Okay. So much for vision, let's go back to reality.

There are a few things in the way, one of course being expense. This isn't cheap. I think we're looking at probably about \$500 a meter on our system, a billion dollars cost for us. There is a massive scope of technology change here. Every system in the company changes. That's a huge IT obstacle to figure out how you roll these in, how you make this work.

And of course, the resources become strained. We're already looking at an aging workforce. Most of us take that to mean you've got to start hiring duplicate jobs. You bring young people in, train them in those jobs. You already have more people coming in to try to replace that workforce, and now you've got another task to give them as well.

Frankly, time is not our friend. Because of the aging workforce, the aging infrastructure, and rising consumer expectations – and I would put in that expectation prices; as prices continue to rise, the natives are going to get more and more restless, and they're going to be looking for alternatives and want things to come out sooner rather than later.

But I'll tell you these obstacles are not existential, they are temporal. They slow things down, but they don't stop where we are going. The real question is how fast we do this: can we do it in ten years, is it going to take thirty years? And finally what are the cultural barriers to making this happen? There are a lot of people, probably a lot of people in this room, with a vested interest in the system the way it is. And the cultural change to make this is not a small issue. A lot of consumers are simply in the old paradigm. CenterPoint Energy has not sold electricity in Texas – we've been the T&D delivery company since 2001, and I get bill complaints all the time. I don't send a bill to people. They just have not made that disconnection in seven years. That old paradigm is very hard to break.

Short-term thinking. We tend to get captive to that. I want to lay that out now as one of the big challenges for you today not to think in the short term. We've got to look at this as a long-term solution. Piecemeal solutions will be the worst enemy of where we want to go. The inability to imagine and embrace a new virtual utility paradigm. We all grew up in a much earlier generation. We've been in this, but we can't replicate the system based on an old paradigm.

The challenge I gave to the leadership of our company when we started looking at this is if we were able to start over and we were to turn the grid over to a bunch of twenty year-olds and said "design a utility," would it look like the one we're operating? And I don't think the answer would be yes. I think they would take a different technological approach, a very different way to look at this, and move forward. And I think that we have to take that very fresh look.

We need a collaborative spirit. We need coordination of the research and development dollars between utilities and the vendors, and what I think is the overwhelming issue for us is the lack of standards, of definitions, of interoperability. There's a real temptation to want to build proprietary systems for people to sell their product, and sure we'll have a standard – just take the one I made and let's all use it. And utilities have a real penchant for wanting to build their own system.

I was telling Rich there are three major utilities in Texas and we all have the same voltage on our transformers, but the transformers we hang on the poles, all three of our companies use a different one. I couldn't take mine and take it to Dallas and put it on a pole. It wouldn't work. And that's only been around for about a hundred years.

And that's the type of obstacles I think we're going to have to overcome. And again, a vested interest and unwillingness to overcome the paradigm.

Solutions – a call of opportunity

So what are the solutions? Well, number one is let's assess the cost of not doing this. Of having increasing energy consumption going forward. Of an aging electric grid that's pushed to the breaking point. Lost revenues associated with outages. Environmental impacts. The cost to continue manual operations is not linear going forward. With an aging workforce, the cost of manual operation of the system is exponential. You're fooling yourself if think your costs are only going to go up linearly with time and with the inflation rate.

You've got to take a holistic approach to this. One of the things I think is a real challenge is as you perhaps digitize a part of the electric grid, you go to a part of your grid that's more critical, so you put the digital relays in there, and if you have a more rural area maybe you leave the old analog relays out there because they're working fine and it's not that critical a function. If you start digitizing your grid, if you're going to move to a smart grid, the whole thing has to be done. You have to convert every substation, every feeder, every piece at the same time. Of course you prioritize how you do that, but in order for this to work effectively, everybody has got to have access and it requires a very holistic approach. That work is going to be a challenge for us as well.

It's very important for us to capture institutional knowledge. The future is ours to shape now before it shapes us, and you begin to have economic forces that unhappy people create that begin to push us into directions that we really don't want to go, or that are not the best end result for where we want to go.

Two years ago there was no discussion of a smart grid to any meaningful extent. Certainly no meetings like this occurred. And look how much has happened in that very short period of time. I tell you it's only going to accelerate. Plug-in electric vehicles are two years away. People are going to start seeing that as more than just a car. They are going to start asking "What else can I do if I've got this energy source?" And if we're not ready to accept that, it's going to be shame on us.

We have to challenge the short-term thinking, and what I call for you to do here today is to develop that roadmap. It can't be just first to market and let's take that one and let's move. We've got to put some real, significant thought into where does this go, how does it go, what's the end state here.

APQC is the American Productivity and Quality Center. Jeff Barney is over here in the corner – stand up Jeff – with APQC. The reason I want to point him out to you is they have developed a maturity model for the smart grid. And that maturity model is one that allows you to see where you stand in terms of the different aspects that are going to be required for a smart grid. And we're developing that survey because we want to see where we are nationally. This is a free thing; no salesman will call. But I do really encourage you to get with Jeff and take the survey. It will provide a lot of valuable information that you can use and others can use on the state of maturity of this market.

As I said earlier, mandates will create the markets; the markets will drive the solutions. We'll have participation willingly in user-friendly solutions. It's going to take a lot of collaboration, and national standards. I want to spend just a minute on this because this is your call to action today.

What we need to see out of this is something that operates like the Internet does. And not even as one-off as cell phones are where we have an AT&T and Verizon and other carriers but each one operating on its own. It's got to be a single solution, and let me take this down to the consumer side of this. If we're going to have smart refrigerators, if we're going to have smart air conditioning systems that can report when their freon is low or call the repairman, or all those things that manufacturers want to make, we can't have 50 different protocols for 50 different states. They can't make a different air conditioner across the board, or my utility likes this protocol but yours likes that. There's got to be one.

That requires standards at a fairly base level. And we need those standards working all the way up so that across the board we have the ability to have vendors make their own discrete products, make their own choices in terms of what they think the market wants, what consumers want to have, but communicate in a common fashion so we can all share those devices, which is the type of plug-and play compatibility that I talked about earlier.

As I said, what is important is to shape the future before it shapes us. Communication ignites transformation. That goes back to the Guttenberg press. We have seen that when people have information, it creates change. Once we have this digital two-way communication, I don't think the rest is a big leap -- the realization of a Home Area Network, deconstructing this whole paradigm. And let me offer one last analogy: I would take the telephone land line.

I bet you could do this on age in terms of who has a land line in their home and who doesn't. The telephone companies have land lines; it's not exactly their growth sector. That's where we are. If you look at the traditional utility (there are good uses for landlines, they'll always be there for some function) and there are a lot of utility functions that will be there going forward.

But it's not where the technology is leading. It's not where the end game is in terms of where is the growth, what is the opportunity. These growth opportunities are non-traditional. And I don't mean to issue this as any kind of call of warning; it's a call of opportunity. These online energy services are where the money will be made. You have to understand the market and be willing to get into these new spaces. And this collaborative management of the market between the generators, and ISOs, and REPs, and TDUs [Independent System Operators, Retail Electric Providers, Transmission and Delivery Utilities], and vendors and everybody in this room to make this happen. And I do believe the utilities that respond the most quickly will be the most successful.

Call to action – capture the collaborative spirit of the utility

So let me close with this: why are you here? The virtual utility is going to happen. The question is will this smart grid be built haphazardly, or will we work together to build a product that we'll all use and be very proud that we were a part of. Organizations like the Department of Energy, organizing these types of forums, the GridWise alliance and others that have worked to bring groups together to try to form these standards and get the legislation going forward, are critical to develop common standards.

What we need to do is invoke the collaborative spirit that utilities have. We're there for each other in times of mutual assistance in times of disaster. The question is will we work together in facing what I believe is the most significant transformation in the history of our industry? The call for you today is to come together as a group to look for these standards, to look for this commonality, and think if you will that ten years from now if people look back to this era will they say "boy, they really got it right. This thing really works."

You find yourself today in the position to shape that change. I would not take the questions you'll be asked over the next couple of days lightly. The utility industry will shape a big part of our country for the next twenty or thirty years, and we can do this right or we can let it sort of fumble along its own way and get done. I think the question is will we work together in facing this most significant transition of our industry? And I hope here as we come together in our nation's capital that we'll come together as a group to say "yes."

Thank you for the time to talk to you today, and I'll be happy to answer any questions.