

UNITED STATES OF AMERICA  
DEPARTMENT OF ENERGY

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STUDYING THE COMMUNICATIONS REQUIREMENTS

OF ELECTRIC UTILITIES TO INFORM FEDERAL

SMART GRID POLICIES

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PUBLIC MEETING

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THURSDAY,

JUNE 17, 2010

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The Public Meeting was held in  
Room 8E069 at the Department of Energy,  
Forrestal Building, 1000 Independence Avenue,

S.W., Washington, D.C., at 10:00 a.m., Scott  
Blake Harris, Chair, presiding.

PRESENT:

BECKY BLALOCK

SHERMAN J. ELLIOTT

LYNNE ELLYN

SCOTT BLAKE HARRIS

JIM INGRAHAM

JIM L. JONES

MICHAEL LANMAN

KYLE McSLARROW

ROY PERRY

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P-R-O-C-E-E-D-I-N-G-S

(10:01 a.m.)

CHAIR HARRIS: My name is Scott Harris. I am the General Counsel of the Department of Energy.

I would like to thank all of you for joining us today. I'd like to thank particularly our panelists for joining us today.

I have been at the Department of Energy for just over a year. I actually came from the telecom sector. I think the biggest surprise I have had moving into this department, and into this sector, is the astonishing scope and diversity of the Department's efforts to work with the private sector to improve energy generation, transmission, and use, from helping restart the nuclear industry to helping jumpstart the renewables industry, from helping increase appliance efficiency to helping weatherize homes.

1           The Department of Energy really  
2 does seem to be working on all pieces of the  
3 energy puzzle. Yet having said that, I think  
4 there is no piece of the puzzle that seems to  
5 generate more excitement than the smart grid.

6           And what is fascinating is that  
7 interest in the smart grid, it seems to me,  
8 comes equally from Washington policymakers,  
9 from state regulators, from industry, and from  
10 the public. And that part in particular I  
11 think makes smart grid different than some of  
12 the other important endeavors in which we are  
13 engaged.

14           But as I have talked with folks  
15 about the smart grid in greater detail, I have  
16 come to realize, or at least it has occurred  
17 to me, that we are not all entirely on the  
18 same page. When I talk to utility companies,  
19 I tend most often to hear about how the  
20 interactive grid will help with reliable --  
21 reliability and with bringing renewables  
22 online.

1           The focus is more often than not  
2           on the utility side of the meter rather than  
3           the consumer side of the meter, and which  
4           makes sense -- utilities have to manage the  
5           grid. And I also hear when I talk to  
6           utilities most often that we need to build our  
7           own networks. Because of our need for  
8           reliability, because of our need for security,  
9           we do need to do this ourselves.

10           When I talk to the telecom  
11           companies, more often than not -- and I don't  
12           mean to say this is uniform, but more often  
13           than not I tend to hear about how an  
14           interactive grid can help consumers use data  
15           and interactive devices to save energy and to  
16           save money.

17           The focus tends to be more on the  
18           consumer side of the meter than when I talk to  
19           the utility companies. And I also hear,  
20           perhaps not surprisingly, that commercial  
21           networks, wired and wireless, are the most  
22           cost effective means for utilities to gather

1 and use data and for consumers to take  
2 advantage of that data.

3 And, finally, when I speak to  
4 state regulators, they tend to shake their  
5 heads. They tend to be very concerned about  
6 how we are going to pay for rolling out smart  
7 grid technologies, and, understandably, they  
8 are concerned about the equity of it.

9 In telecom, I can choose to buy an  
10 iPhone, or I can choose to buy something a lot  
11 more basic. Consumers, generally speaking,  
12 don't get today to choose their meters. They  
13 get what they get, and they pay for what they  
14 get. How do you deal with that when we are  
15 talking about rolling out interactive  
16 technologies built into the meter and to other  
17 parts of the grid?

18 Secretary Chu believes that smart  
19 grid technologies can be used to improve  
20 reliability, to bring renewables onto the  
21 grid, and to help consumers use energy more  
22 efficiently and more inexpensively. In other

1 words, he and this department and the  
2 administration generally believes that we can  
3 turn our existing transmission system into an  
4 interactive one that lets consumers and  
5 businesses use near real-time data to monitor  
6 and adapt their energy usage while utilities  
7 use that data to monitor the functionality of  
8 the grid itself.

9           Basically, we can do both things.  
10 We can look both to the utility side of the  
11 meter and to the consumer side of the meter.

12           So with that all in mind, the goal  
13 of the request for information that we issued  
14 last month, and of today's session, is  
15 essentially to open up a dialogue among  
16 regulators, the utility sector, and the  
17 telecom sector.

18           I would like utility companies to  
19 talk about their vision of the smart grid, and  
20 what they think they need in terms of advance  
21 communications to make the smart grid  
22 technologies work. I would like to have

1 telecom companies talk about their  
2 capabilities and their vision of how they can  
3 play in the smart grid world. And I would  
4 like regulators to talk about their concerns  
5 about cost and their concerns about equity.

6 So to this end, I have assembled  
7 today some of the best and brightest minds in  
8 the utility and communications industries, and  
9 one of the leading thinkers in the regulatory  
10 community, basically to begin this discussion,  
11 not to end it but to begin it. It is a  
12 discussion I hope we will have take place over  
13 the next several months, and we hope some of  
14 you in the audience will participate.

15 What I plan to do is first briefly  
16 introduce each of our panelists, ask a couple  
17 of questions, hopefully to get a discussion  
18 going among our panelists -- please don't let  
19 me down here, because I don't have a lot to  
20 say -- and then to invite you all to  
21 participate in the discussion.

22 So let me start first with Becky

1 Blalock. Becky, to my right, is the Senior VP  
2 and CIO of the Southern Company. She directs  
3 IT strategy and operations across 120,000  
4 square miles and nine subsidiaries of the  
5 Southern Company. Her responsibilities  
6 encompass infrastructure, networks,  
7 applications, telephony, and cyber security.

8 To my left is Kyle McSlarrow.

9 Kyle is the President and the CEO of NCTA, the  
10 National Cable and Telecommunications  
11 Association. Kyle is the cable industry's  
12 primary public policy advocate, and the truth  
13 is we are welcoming Kyle home today. Kyle is  
14 the former Deputy Secretary of the Department  
15 of Energy, and it is pleasing for me to have  
16 someone who has got a foot in both sectors,  
17 because I sometimes feel alone in that.

18 We also have Mike Lanman. Mike is  
19 the President for Enterprise and Government  
20 Markets at Verizon Wireless. He is  
21 responsible for all sales and service to  
22 multi-national corporations and federal

1 government accounts, and, in particular, is  
2 thinking about what Verizon Wireless can do  
3 for the utility sector.

4 To my far left is Lynne Ellyn.  
5 Lynne is the Senior VP and CIO of DTEnergy, a  
6 diversified energy company involved in the  
7 development and management of energy-related  
8 businesses and its services nationwide. Lynne  
9 leads an organization of over 700 people that  
10 provides IT strategy, development, and  
11 operations for all of DTEnergy companies.

12 We also have with us Jim Jones.  
13 Jim is the CIO of Great River Energy. Great  
14 River Energy is a not-for-profit electric  
15 cooperative owned by 28 member cooperatives  
16 and is the second largest electric power  
17 supplier in Minnesota. Jim has primary  
18 responsibility for the deployment and support  
19 of Great River Energy's communications network  
20 and infrastructure.

21 On the other side of the table we  
22 have Roy Perry. Roy is the Director of

1 Strategic Assessment at Cable Labs. He  
2 manages several cross-industry initiatives  
3 focused on deployment and operations of  
4 advanced applications and services on cable's  
5 broadband infrastructure.

6 He leads the security monitoring  
7 and automation program at Cable Labs, which  
8 developed SMA interoperability specifications  
9 which were subsequently selected as the draft  
10 standard for national smart grid  
11 interoperability.

12 We have Sherman Elliott on my  
13 right, who is the Commissioner from the  
14 Illinois Commerce Commission. He serves on  
15 NARUC's Energy Resources and Environment  
16 Committee, and on FERC's Smart Grid  
17 Collaborative.

18 Commissioner Elliott also serves  
19 as a member of the NIST Energy Infrastructure  
20 and Security Act business and policy domain  
21 expert working group on the smart grid. When  
22 are you ever in Illinois, actually?

1 MR. ELLIOTT: A lot of phone  
2 calls.

3 CHAIR HARRIS: A lot of phone  
4 calls.

5 And, finally, we have to our left  
6 Jim Ingraham. Jim is the Vice President of  
7 Strategic Research for the Electric Power  
8 Board of Chattanooga, one of the largest  
9 publicly-owned providers of electric power in  
10 the country.

11 Jim leads a team that focuses on  
12 the development and challenges of future  
13 projects and opportunities facing the utility  
14 and communications industries.

15 So as you can see, just from a  
16 brief recitation of their events -- and I  
17 promise me -- I promise you I gave you the  
18 short version -- this is a well-qualified  
19 panels of folks who actually understand smart  
20 grid. They understand communications. They  
21 understand networks and the utility sector.

22 So let me start this way.

1 Secretary Chu and the rest of the  
2 administration believe that smart grid  
3 technologies are a critical part of building  
4 a clean, more secure, and more sustainable  
5 energy future. So starting with our friends  
6 from the utility community, what is your  
7 vision for the use of smart grid technologies,  
8 and what have your companies begun to do, if  
9 anything, to start to implement that vision?  
10 And there is no order, so feel free to step in  
11 and --

12 MS. ELLYN: Well, we are actively  
13 involved in a smart grid project. We have  
14 rolled out 30,000 homes. We are scaling up to  
15 600,000 over the next year.

16 CHAIR HARRIS: From 30,000 to  
17 600,000 in a year?

18 MS. ELLYN: Yes.

19 CHAIR HARRIS: Okay.

20 MS. ELLYN: The 30,000 we are  
21 still working some of the issues that you have  
22 with new technology out. But we have been

1 operating for over a year with those 30,000.

2 Like Becky will tell you, we have  
3 all sorts of challenges in our distribution  
4 network, because we have rural areas, we have  
5 city areas, we have very poor areas, we have  
6 very affluent areas. So just coordinating  
7 this, just the coordination of this, is  
8 difficult.

9 We are doing a -- at the beginning  
10 of a pilot with 5,000 homes that will be  
11 interactive and have lots of the new and  
12 promising technology in them to see how they  
13 react, and so we have a number of partners.

14 To be really clear, we spend a lot  
15 of time with our telecommunications partners  
16 making the appropriate choices at various  
17 parts of our entire grid. We talk about the  
18 smart grid as though the current grid was  
19 stupid. The current grid is amazingly smart  
20 and amazingly reliable.

21 I have been in five industries.  
22 The amount of complexity in managing and

1 balancing the flow of power is really pretty  
2 awesome, and we do that with fairly  
3 intelligent devices today.

4 The grid automation that is coming  
5 along, which will refine that even further,  
6 has the potential to make us even more  
7 efficient, more responsive, improve  
8 reliability, and, as everyone is saying, bring  
9 into the grid other sources of power than the  
10 current fixed stations that we have.

11 But make no mistake about it -- it  
12 is pretty tricky stuff and requires a strong  
13 background in science and engineering to do  
14 that. All throughout the grid there are  
15 wireless and wired communications. We use --  
16 as most electric companies do, we use a  
17 variety of providers, because nobody has the  
18 entire coverage, and there are components that  
19 are not, as you said, near real time. They  
20 must be real time or the consequences are  
21 really quite egregious.

22 CHAIR HARRIS: So can I ask you --

1 before we give others a chance, can I ask you  
2 to describe in a little more detail exactly  
3 what it is you are doing or hoping to  
4 accomplish with this project where you are  
5 rolling out from 30- to 600,000 homes. What  
6 is going on? What services are you providing,  
7 or what information are you getting, or what  
8 are you actually accomplishing? I mean, what  
9 are we doing here?

10 MS. ELLYN: Well, by being able to  
11 speak to the meters, we have the operational  
12 benefits of, when somebody wants to move,  
13 turning off and turning on without rolling a  
14 truck, which, as regulators know, reduces the  
15 cost to the consumer and improves the  
16 responsiveness to the consumer.

17 We have the ability, once this is  
18 all fully engineered, to know the state of the  
19 last mile. And people talk about the last  
20 mile -- the bid of the distribution network  
21 that is from the distribution transmission  
22 core to your home, knowing more, if there is

1 an outage that it affected three homes, or it  
2 affected a whole line, or whatever, again  
3 being able to respond much more effectively.

4 When we get catastrophic storms  
5 that knock out 100,000 or 400,000 customers,  
6 and they are spread all over the service  
7 territory, we don't always know the details of  
8 who is out and the like. We know there is  
9 large areas out, but now we are waiting for  
10 people to -- they have to phone in, sometimes  
11 the phone lines are down, and so on.

12 So we will know because we will be  
13 getting information from those devices on a  
14 regular basis, and we would have the ability  
15 to ask the device, is it up and operational?  
16 So that will be very useful for planning  
17 emergency response and knowing the state.

18 Also, balancing -- balancing the  
19 flow of power and knowing what is being  
20 utilized is of tremendous operating value.

21 Now, to the hopes and dreams of  
22 the telecommunications and the high tech

1 industry. We do see that there is plenty of  
2 opportunity for companies to provide services  
3 based on information that the consumer may  
4 have access to in the future. However, there  
5 are already those type of devices that a  
6 person can choose to put into their home where  
7 they would know this and could make those  
8 decisions right now.

9 So we are all interested to see if  
10 the consumers will more readily embrace that  
11 than they have embraced the opportunities in  
12 front of them today, and that is why we are  
13 going to do some pilots with our customers to  
14 really find out how that can benefit them.  
15 And the devices and the like are coming from  
16 other providers.

17 CHAIR HARRIS: Okay. Can I turn  
18 to some of the other utility companies, how  
19 you think about smart grid, what services you  
20 hope to provide, or how you hope to use those  
21 technologies, and your view of the role of  
22 telecom companies in providing those

1 technologies?

2 MS. BLALOCK: Okay. At Southern  
3 Company, it is really the whole chain of  
4 events. It really begins with looking at not  
5 just the smart grid, but how do we bring in  
6 smart power, how do we bring more renewables  
7 into our system. We don't have a lot of  
8 renewables in our service territory that are  
9 very economic, although we continue to explore  
10 and we are building a huge solar facility in  
11 New Mexico. We do have some biomass and some  
12 methane.

13 But one of the things that I think  
14 we have got to think about, and we -- and it  
15 will certainly require more communications --  
16 is that a lot of the renewables are  
17 intermittent in the way they generate power.  
18 So we are going to have to have the ability to  
19 get a lot of data that tells us how to bring  
20 those sources of generation into our  
21 generation mix.

22 When you look at the grid, we were

1 fortunate enough to win a \$168 million grant  
2 from the government, and we will be using that  
3 to do increased automation on our system,  
4 putting intelligent devices out there that  
5 allow us to reduce line losses, which are not  
6 great.

7 We were already probably one of  
8 the most automated utilities in the country.  
9 And, in fact, if you look at Hurricane Ivan  
10 when it hit our service territory, we were  
11 able to restore about 800,000 customers who  
12 were out in the state of Alabama. With the  
13 click of a mouse we restored 200,000 of them.

14 So it is clearly going to increase  
15 our ability to reduce outages when we have  
16 major storms, have more intelligence around  
17 how we control the flow of voltage on the  
18 system, and most of the focus when you talk  
19 about smart grid is around the meters.

20 We have two and a half million  
21 meters that have been deployed. Our goal is  
22 to have all of our residential customers with

1 a smart meter, which will be four and a half  
2 million. That rollout will not be completed  
3 until 2012.

4 This was started before, really,  
5 there was a lot of hype about smart grid. We  
6 are rolling these meters out, because it is  
7 allowing us to not have to go out and read a  
8 meter at somebody's home, and we are not  
9 having to roll trucks. So we are getting cars  
10 off the road; there is a good environmental  
11 impact, as well as the fact that it should  
12 lower -- it is going to lower our cost.

13 The meters we are putting out  
14 there today, though, aren't very smart. All  
15 the meters we have put out there at Southern  
16 Company can do is read. Now, that's not to  
17 say they can't be expanded in the future, but  
18 the business case isn't there today to put a  
19 home area network in that meter.

20 And we are not convinced today  
21 that that is where the home area network will  
22 be. It may be that the home area network is

1       inside the home, and that the intelligence  
2       from our meter just tells the customer how  
3       much power they are using at any given point  
4       in time.

5                 One of the concerns that I have --  
6       we cannot do everything we need to to roll out  
7       the grid. We will have to have partners, and,  
8       in fact, do today. Public phone carriers are  
9       a key part of our strategy and how we are  
10      delivering this. The back haul on our meters  
11      is -- we have a variety of public carriers who  
12      are transporting that data.

13                In the year that we have had it in  
14      operation, though, we have had four pretty  
15      significant outages, which was not a big deal,  
16      because we are only using the meters to  
17      provide a reading once a month.

18                There is some talk that we will  
19      have to go to real-time data on those meters,  
20      and my concern is that we had an outage last  
21      Friday for eight hours. If we have to go to  
22      real-time reading, we may have to come up with

1 some other alternatives that are a little more  
2 reliable in terms of how we provide that data.

3 In terms of the other part of the  
4 grid -- and that is smart choices, giving  
5 customers the ability to do more to control  
6 how they use energy in the home. And, you  
7 know, appliance manufacturers will be coming  
8 up with smart appliances.

9 There are home area networks out  
10 there now that the customer can go and buy.  
11 They don't need to come to their electric  
12 utility to get that. And I would think there  
13 are going to be tremendous opportunities for  
14 the carriers in terms of how they interact  
15 with those customers.

16 And certainly electric vehicles  
17 are going to be a big part of smart grid.  
18 When you think about an electric vehicle, one  
19 of the things we are concerned about in the  
20 industry is if you have five people that drive  
21 -- or, you know, lots of people that drive  
22 home in a neighborhood, and they all plug in

1 at 5:00 in the afternoon, we are going to have  
2 a problem, because the distribution network is  
3 not engineered well enough to accommodate  
4 that. So there will need to be some  
5 intelligence.

6 I have been talking to car  
7 manufacturers who say it may be that the car  
8 has a reservation system, where it makes a  
9 reservation with us for when it is going to  
10 charge. But one of the things that is very  
11 unique about utilities is that you have a  
12 product that cannot be stored. You have to  
13 manufacture it as it is being used, and you  
14 have to have a lot of intelligence about  
15 everything that is going on on your network in  
16 order to protect the equipment.

17 And that is why utilities have  
18 always had their own control networks, for the  
19 things that were mission critical. We have  
20 nine -- five nines of reliability on our  
21 system, and most of the public carriers will  
22 tout that they have 99 percent reliability.

1 Ninety-nine percent reliability means that you  
2 can be down three and a half days a year.

3 Five nines, like we have, means  
4 that you can be down about six minutes in a  
5 year. So the reliability standards from which  
6 utilities operate under is much more stringent  
7 than what you will find with public carriers.

8 The reason we have our own radio  
9 system -- and this proves out time and again  
10 -- we were actually mandated to get into that  
11 business. After the blackout in New York in  
12 1965, the Federal Power Commission mandated  
13 that utilities had to have their own backup  
14 communications. They were very concerned  
15 about this issue of interdependency.

16 And the reason it took so long to  
17 recover after the blackout was that utilities  
18 could not communicate with each other. So  
19 that's why we invest in these radio systems,  
20 you know, and we have that communication  
21 really for emergency purposes, and it has  
22 served us well.

1           I lived through Hurricane Katrina  
2 when that hit our service territory, and the  
3 only communication device that worked after  
4 that storm was our own tool, and that is --  
5 that is Southern Link. And we would have been  
6 in serious trouble had we been dependent on  
7 public carriers who did not have service for  
8 days on the back end of that, and that is  
9 because we have backup generation on every  
10 single facility that we have.

11           It's my understanding that after  
12 the Katrina incident the FCC required public  
13 carriers -- or was going to require public  
14 carriers to put backup generation on all of  
15 their cell sites, and that was subsequently  
16 fought in court by the public carriers and was  
17 overturned.

18           So they do not have the backup  
19 capacity that utilities would require in  
20 emergencies.

21           CHAIR HARRIS: Okay. So I think  
22 we have to have the carriers respond, before

1 we go out to some of the energy companies.

2 Michael, I couldn't help notice you -- but  
3 notice you smiling over there.

4 MR. LANMAN: Well, it's -- you  
5 know, there is a perception that anybody in  
6 the industry would hold about, you know, their  
7 performance and others. And it is --  
8 sometimes it is related to the experience they  
9 have had with a given carrier.

10 I will tell you that at Verizon,  
11 you know, we have invested \$100 billion in our  
12 network in the last 10 years. And that  
13 includes investments in cell sites where we  
14 have 40,000 of those across the country today,  
15 all of which are battery backed up and 90  
16 percent of which -- and this is not through  
17 regulation, but just through our own DNA if  
18 you will -- have generators on them.

19 So we have put generators on any  
20 cell site that would accommodate it that is in  
21 our network. And just some of them, you know,  
22 might be sitting on top of an apartment

1 building and wouldn't accommodate them.

2 We have 100 percent backup battery  
3 power to the 175 switch locations that we have  
4 across the country, and we have a generator  
5 backup to 100 percent of those. So we have  
6 learned a lot over the years, you know, since,  
7 you know, things like the blackout in New  
8 York.

9 And our whole brand has been about  
10 building a reliable network and a nationwide  
11 network, and, whereas no one is perfect, you  
12 know, we, too, rate ourselves not -- you know,  
13 as a 99 percent kind of reliability metrics,  
14 but five nines reliability.

15 We are signing service-level  
16 agreements with our customers regarding our  
17 network performance. So we have come a long  
18 way in 10 years as Verizon Wireless, and I  
19 think many of the commercial carriers have  
20 really put a premium on performance.

21 I lived through eight hurricanes  
22 in the state of Florida while working with

1 Verizon Wireless, and it was an incredible  
2 experience to have the power companies calling  
3 us saying, you know, "We can't communicate.  
4 Can you loan us some phones?" which we did.  
5 So I think we have both seen these  
6 experiences, and yet I see them through the  
7 eyes of Verizon Wireless.

8 CHAIR HARRIS: Michael, can I ask  
9 you a question?

10 MR. LANMAN: Yes, sure.

11 CHAIR HARRIS: One thing I have  
12 often heard is that utilities say, "Look, we  
13 have special reliability needs, and we are not  
14 -- yet we are not a big enough market for the  
15 telecom companies to do anything special for  
16 us."

17 So I guess my question is twofold.  
18 One, do you believe that you need to do  
19 something special for the utilities, or is  
20 your basic network good enough? And if you do  
21 think you need to do anything special, are  
22 they big enough to make it worth the effort?

1                   And does -- and just to make it a  
2                   little more complicated, does that differ  
3                   depending upon where in the grid we are  
4                   talking about, whether it's on the consumer  
5                   end, the generation and transmission end, or  
6                   the distribution end, you know.

7                   MR. LANMAN: Well, that's a great  
8                   question, because our company restructured in  
9                   the -- at the end of last year, and we created  
10                  a unit which I now run. Prior to that, I was  
11                  the chief marketing officer. But part of that  
12                  focus that -- was to understand better the  
13                  needs of customers in verticals, and one of  
14                  the verticals that is very important to us is  
15                  the utility vertical.

16                  And we have developed an entire  
17                  organization that has a vice president who  
18                  runs it, that has data engineers, product  
19                  development people. It is an organization  
20                  that is focused purely on the utility  
21                  industry.

22                  Why do we do that? Because we

1 know that we've got a hardened network that  
2 has survived the kind of crises that this  
3 country has seen over the last 10 years and  
4 gets better every year. With an investment  
5 like \$100 billion, you expect it to get better  
6 every year.

7 But we also know we don't meet all  
8 the needs, and that is one of the reasons we  
9 have just funded the study with the UTC is to  
10 understand better, you know, what is the --  
11 what are the needs of the utility community?  
12 How can we better serve them? And we are  
13 willing to make the investments to do that,  
14 and I think, you know, we have shown that just  
15 with the business unit that is in charge of  
16 that sector for us, but also with investments  
17 we made.

18 And we just -- I just put a cell  
19 site up in the middle of the mountains in  
20 Colorado for an oil refinery that is there,  
21 because one of our key customers needed  
22 coverage there. There's 200 people there. A

1 cell site would typically cover thousands and  
2 thousands, but it is an example of what we are  
3 willing to do to meet the needs of specific  
4 customers.

5 We are developing technologies  
6 that meet these needs as well. We -- many of  
7 you know we opened our network for our open  
8 development initiative, giving out software  
9 development kits to innovators in the  
10 marketplace to develop new technologies, some  
11 of which have been smart meters and components  
12 of the smart grid, but it serves other  
13 industries as well, the point here being that  
14 it is not just about investing in the core  
15 network and having a good enough consumer  
16 network. It is about understanding the needs  
17 of the specific verticals, being willing to  
18 invest in them -- and we have proven that we  
19 are -- and collaborating with them.

20 And I think Lynne said it very  
21 clearly. It is -- you know, we don't disagree  
22 with some of the needs that we may not be able

1 to meet in the utility industry. But we are  
2 willing to work with each utility, and we are  
3 -- currently have more than a million  
4 endpoints in the smart grid ourselves that we  
5 have deployed. But we are working with 20  
6 large utilities, and many other smaller  
7 utilities, to understand what kind of a smart  
8 grid solution do they want to put in place.

9 CHAIR HARRIS: Kyle, can you talk  
10 about the cable sector or --

11 MR. McSLARROW: Sure. And I think  
12 I would -- I would try to take this sort of  
13 one step farther than where this discussion  
14 has been, because actually in my mind you can  
15 probably divide it many ways.

16 I sort of divide this into two  
17 parts. First, just -- I mean, I know you know  
18 this, but just for others here -- the cable  
19 broadband infrastructure is in front of 92  
20 percent of American homes, so 100-plus million  
21 homes. That infrastructure is capable today,  
22 on average, of delivering about 10 megabits

1       downstream.

2                       We have standards in place right  
3       now where the wiring in the home, which  
4       probably won't be fiber -- it will probably  
5       still be some form of co-ax -- can transfer a  
6       gigabit of data around the house to do  
7       whatever.

8                       So I think part of the  
9       conversation here -- I think Lynne is right.  
10      I mean, drawing on my experience at DOE and  
11      then in this job, I have seen two networks  
12      that are highly intelligent, very robust, five  
13      nine reliability, huge focus on security  
14      concerns, now more recently a lot of focus by  
15      all of these networks in cyber security  
16      concerns, and I think there is a natural  
17      relationship that already exists, as Lynne  
18      said, and others, in terms of the carriers and  
19      the networks working together in terms of how  
20      the networks actually operate. That is one  
21      way to think of smart grid.

22                       The other way, just to throw out,

1       you know, sort of a further step of the  
2       vision, at least in our industry we are  
3       thinking about is, what does it mean for the  
4       home? And you can look at it narrowly, you  
5       know, in the sense of, you know, demand  
6       response, you know, managing your energy  
7       consumption, energy efficiency, and all of  
8       that, and obviously that ties directly into,  
9       you know, potentially the meter or the network  
10      that -- or the grid that is actually providing  
11      electricity.

12                 I think one conundrum is, if you  
13      think about -- I'm going to use the term  
14      "gateway." It's not actually right, but I  
15      think it's a useful term. But, I mean, in  
16      some sense you've got these networks that  
17      deliver something to the home, and then there  
18      is gateway. For video it is called a set-top  
19      box. For broadband it is called a modem.

20                 Maybe you would say the meter is  
21      that, although if it's a dumb meter that  
22      doesn't quite work. That's why it falls down

1 a little bit. But there is some ability for  
2 the consumer to control that experience in the  
3 home, and there is something there at the  
4 home, either an attachment or something in the  
5 cloud, that is allowing that control.

6 And I think part of the conundrum  
7 here is, when you -- we know we already have  
8 a broadband infrastructure that allows us to  
9 do all kinds of things, and we think the home  
10 will be a completely all-digital and all-IP  
11 environment.

12 The question is: what about all  
13 of the other things that people will want to  
14 do in their home? Because it's not just smart  
15 grid or demand response. It is going to be --  
16 you know, as Roy has been working on, it is  
17 going to be security, home security  
18 management. It is going to be video chat in  
19 every room in the house. We are not going to  
20 probably want everybody stacking up a bunch of  
21 gateways in a garage, even if they all are  
22 Energy Star devices, right?

1                   And another conundrum is that we  
2                   are moving increasingly to putting this kind  
3                   of control and data storage in a cloud. We  
4                   are not even thinking about necessarily a  
5                   device in the home.

6                   So I think as you -- I mean, you  
7                   are focused correctly on smart grid, but I  
8                   think part of the conundrum, at least for our  
9                   industry, maybe for other carriers is, what  
10                  about all of the services that we are thinking  
11                  about, that we are trying to offer that home  
12                  environment? Can they actually be pulled  
13                  together?

14                  CHAIR HARRIS: Jim, do I recall  
15                  correctly you are laying fiber to the home?

16                  MR. INGRAHAM: We are.

17                  CHAIR HARRIS: Why don't you talk  
18                  about that?

19                  MR. INGRAHAM: Yes.

20                  CHAIR HARRIS: Because not a lot  
21                  of people are doing that, and one would not  
22                  have guessed one of the first folks to do it

1 is a public utility.

2 MR. INGRAHAM: Right. And just a  
3 little bit about EPB, the Electric Power Board  
4 of Chattanooga. We serve a service territory  
5 about 600 square miles, parts of east  
6 Tennessee and north Georgia, nine counties.  
7 We are about a \$500 million a year company.  
8 We are a distributor of Tennessee Valley  
9 Authority electricity. Our service territory  
10 sits just to the north of the Southern  
11 Company.

12 We have been working on this idea  
13 of a smart grid since 1996. We didn't call it  
14 a smart grid until that term came into vogue  
15 recently, but power quality for manufacturing  
16 is a huge issue today. Outages of less than  
17 five minutes in Chattanooga typically cost our  
18 industrial customers over \$100 million a year  
19 in lost productivity.

20 In 2000, we went into the  
21 commercial telephone business in Chattanooga.  
22 In 2003, we went into the internet business.

1 In 2009, we began to build our fiber optic  
2 network, which connects every home and  
3 business -- we have 170,000 meters on our  
4 system today -- connects every home and  
5 business in that service territory, no matter  
6 where they are, with a fiber optic connection.

7 We put an O&T gateway on every  
8 home. It has a new Tantalus meter that is  
9 going in today that has an IP collector. It  
10 is connected by an ethernet connection to the  
11 O&T, and we are using a 900 megahertz wireless  
12 mesh architecture with some of the customers  
13 around those O&Ts. We are installing O&Ts in  
14 50 percent of our network.

15 The issue that you get into when  
16 you start thinking about these smart grids is  
17 that they are not heterogeneous  
18 infrastructures. They are not just for smart  
19 grid. They are packet switch networks. It is  
20 a very elegant architecture, very simple, very  
21 easy to maintain, very secure. And you can  
22 deliver all kinds of services over this

1 infrastructure.

2 We are working -- we have been  
3 testing on our system power quality  
4 arrangements, upgrading our SCADA system for  
5 the last three years. We have a little over  
6 28,000 switches on our system. We are now  
7 automating all of those.

8 Today we are in the process of  
9 putting a smart meter on every home. It has  
10 a symmetrical two-way communications  
11 capability. We are offering very -- today in  
12 Chattanooga internet products, 150-megabit  
13 symmetrical internet connectivity. And you  
14 actually get 150- megabit symmetrical internet  
15 connectivity, which is a big issue. What do  
16 you really get when you buy these products?

17 In Chattanooga, we got into this  
18 business of communications to complement our  
19 smart grid deployment, because our -- the  
20 market was asking us to do it fundamentally.  
21 But the smart grid benefits are, from a  
22 utility perspective, what we are most

1 interested in and really after.

2           And what we find is that -- a good  
3 example. We have now automated about 50 of  
4 the three-phase switches on our network. Over  
5 Easter we have written algorithms, seven  
6 different routines into our SCADA system,  
7 supervisory control and data acquisition.  
8 Over Easter we had an outage. We had a lot of  
9 rain in the south through the spring. We had  
10 30,000 customers off on Easter Sunday.  
11 Because of those routines, we were able to  
12 restore 10,000 of those customers in less than  
13 a minute.

14           That kind of network automation  
15 doesn't exist everywhere today, we don't  
16 believe. And we believe our industry has got  
17 a long way to go to catch up. We haven't  
18 invested in the R&D that we should as an  
19 industry to make sure we are ready for that  
20 today.

21           At EPB, we have 18 different  
22 software systems running in our IT

1 arrangement. Our storage capacity is 250  
2 terabits, and we are adding 50 terabits to  
3 that. When we have our metering in place --  
4 and we will have it in place next June -- we  
5 will go from reading 11 million data points a  
6 year from our customers, just reading the  
7 meters, we will go to six billion data points  
8 a year.

9           When we have -- when we get to a  
10 place where we actually -- we're reading that  
11 now symmetrically every 15 minutes, and we  
12 will get it down to five minutes. But when we  
13 are reading that every 15 minutes, if we get  
14 to a place where we have customers, where we  
15 have five appliances, reading that on a five-  
16 minute interval, that is almost 90 billion  
17 data points a year.

18           So our ability to manage that  
19 data, our ability to profile our customers,  
20 when they are using this technology, when they  
21 are home, when can we apply time of use rates,  
22 which Tennessee Valley Authority, in our case,

1 is moving toward, and telling us all we have  
2 to have this metering for that, when we apply  
3 critical peak pricing, when we apply direct  
4 load control schemes.

5 We are using our internet  
6 connectivity now to offer the consumer a  
7 portal where they can see their consumption,  
8 where through our IPTV network we are offering  
9 a television channel where they will be able  
10 to go on and actually look at their  
11 consumption.

12 And we are moving very quickly  
13 toward what we think is an automated electric  
14 system. Five years ago, we had almost no  
15 capacity for that at all down below the  
16 substation level. If somebody driving along  
17 the street had an accident and knocked a pole  
18 down, the way we fixed the problem was to put  
19 somebody in a truck and go look for it.

20 Our network, once it's automated,  
21 will have the ability to self-heal itself, and  
22 we believe we will be able to isolate these

1 circuits to very, very small increments of the  
2 electric system, and we will be able to  
3 reroute the power to restore service to a  
4 large area much quicker.

5 The smart grid itself is making us  
6 just as much an IT company as it is an  
7 electric distribution company. We do buy  
8 transport from AT&T. We do purchase transport  
9 services from AT&T and Sprint, and we compete  
10 today directly with the cable company and the  
11 telecommunications companies for customers.

12 CHAIR HARRIS: So is it cost  
13 effective to build your own fiber rather than  
14 use the cable company's network? And to make  
15 it cost effective, do the electric rates have  
16 to get really high? Or do you rely upon  
17 selling, ultimately, cable TV and becoming a  
18 competitive carrier and perhaps solving all of  
19 the FCC's problems by being a third wire to  
20 the home?

21 MR. INGRAHAM: We did a -- we did  
22 a couple of studies. We studied, actually,

1 this idea of the smart grid for -- well, and  
2 entering the broadband business for over --  
3 almost four years before we actually went out  
4 and did a bond offer to build the system.

5 And let me mention that we were  
6 also selected for a smart grid investment  
7 grant. We got \$111 million, and it is helping  
8 us, and we are very proud to be a partner with  
9 DOE in that.

10 We went out and did a study. We  
11 talked to some World Bank economists, and we  
12 asked them, "What is the value of a fiber to  
13 the home network, to a Tier 2 community like  
14 Chattanooga?" A Tier 2 media market is just  
15 about any city without a professional football  
16 team. Okay?

17 (Laughter.)

18 And typically this is where you  
19 see most of the capital investment in fiber  
20 going today. We thought it was going to be a  
21 decade or more before anybody came to  
22 Chattanooga to build an infrastructure like

1 this.

2                   Anyway, we used what is called the  
3 Inplan Model. It was developed at the  
4 University of Minnesota, and used again some  
5 university talent affiliated with the World  
6 Bank. This model is designed to look at -- if  
7 you want to build a regional airport in your  
8 area, a regional hospital, a sports stadium,  
9 what is the value to the community?

10                   That study came back and said that  
11 over 10 years, ultraconservatively estimated,  
12 it would generate over \$870 million in new  
13 commerce, new taxes, new payroll in  
14 Chattanooga, and over 4,700 jobs, new jobs.

15                   Since we did that study, Alstom  
16 Energy and Volkswagen have announced  
17 construction of new assembly plants that are  
18 today being built in Chattanooga, over 12,000  
19 new jobs.

20                   CHAIR HARRIS: Build it and they  
21 will come.

22                   MR. INGRAHAM: And when you show

1       them the data we had, and we tell them, "This  
2       is the reliability levels on our electric  
3       system we are able to create, this is the kind  
4       of communications capacity that we will be  
5       able to provide you," you know, they won't  
6       tell you that it was the prime reason that  
7       they located in Chattanooga, but they will  
8       tell you it is one of the top five reasons  
9       that they located in Chattanooga.

10               So back to your question, is it  
11       cost effective to do this? We didn't think it  
12       was -- we thought it was a bad bet not to do  
13       it. We worked with EPRI on a study of what  
14       was the value to the electric system, and we  
15       determined that over a 10-year period it was  
16       worth over \$300 million to the community and  
17       the electric system for a system that would  
18       cost us \$200 million to build.

19               If nobody ever signed up for a  
20       single internet product, an IPTV service, any  
21       of our telephone service, and we had to junk  
22       the system, we figured out we are talking

1       about about a nickel a month on your electric  
2       bill. Plus, we had the community telling us  
3       loud and clear regularly that they wanted us  
4       to do this.

5                       We did customer surveys, focus  
6       groups, for four years, to make sure that the  
7       community was behind us in this. And the  
8       value of it, quite frankly, in a city like  
9       Chattanooga, we wouldn't have an  
10      infrastructure like this if we waited for the  
11      cable industry or the telecommunications  
12      industry to do it.

13                     CHAIR HARRIS: So, Roy, you don't  
14      like Chattanooga?

15                     MR. PERRY: No, I like  
16      Chattanooga.

17                     (Laughter.)

18                     Well, I think we are talking about  
19      kind of two different issues here -- the smart  
20      grid and the competition in the  
21      telecommunications space.

22                     CHAIR HARRIS: Well, the two can

1 merge it seems.

2 MR. PERRY: Certainly, yes, you  
3 can run those applications over those  
4 networks, you know, very well.

5 I guess, you know, from my point  
6 of view, I have been working in the cable  
7 industry for a long time, looking at new  
8 technologies that consumers would find so  
9 interesting that they would spend some of  
10 their discretionary income every month for  
11 that service.

12 And we have been very successful  
13 at voice, data, and video, and a number of  
14 years ago we started looking at other  
15 applications, such as home security, home  
16 monitoring, automation. And with everything  
17 moving to the web, it became increasingly  
18 clear that what consumers wanted was this  
19 experience where they could have -- use any  
20 device anywhere anytime to get any service.

21 And we are seeing that today. You  
22 can watch video on your iPhone. You can log

1 into your home video monitoring camera and  
2 check in your home. You can control all sorts  
3 of devices in the home over the cloud.

4 The CEO of Comcast demonstrated an  
5 iPad application that allowed you to search,  
6 navigate, and control your TV experience from  
7 your iPad. So we're seeing a lot of these  
8 capabilities being developed today by  
9 applications developers and consumer products  
10 companies that want to give the consumer what  
11 they want.

12 So when we started looking at  
13 energy management, it became clear that there  
14 were a number of players out there, technology  
15 developers, that were also looking at this  
16 space, and saw value in empowering the  
17 consumer to be able to control their energy  
18 and understand what they are using.

19 Waiting a month or two for your  
20 bill doesn't give you kind of the visibility,  
21 the feedback loop, that several studies have  
22 shown are necessary for people to manage their

1 own energy effectively.

2           There has been a couple of studies  
3 that have shown that if you give real-time  
4 feedback to consumers they will reduce their  
5 usage somewhere around 10 percent. And so it  
6 became somewhat clear that if you -- if you  
7 give a user a dashboard with real-time  
8 awareness of what their energy usage is that  
9 you can go a long way towards the consumer's  
10 value proposition of reducing their electric  
11 bill.

12           So the question, then, is: so  
13 what's the business case for this? How much  
14 can you charge each month for energy  
15 management services to a consumer? And if you  
16 are saying them 10 percent a month -- you  
17 know, an average bill let's say is \$100, you  
18 are saving them \$10 a month let's say, how  
19 much could you charge for that? And it became  
20 very clear that you really couldn't charge  
21 more than two or three bucks a month for  
22 something that saved them, you know, \$10 to

1       \$15 a month.

2                   So we have been struggling with  
3       the business case for consumer energy  
4       management, and that has been really what has  
5       slowed down investment in this space. There  
6       are some solutions that are there, but what  
7       has happened is these solution providers have  
8       hit somewhat of a brick wall. They are  
9       convinced that there is value, that consumers  
10      will buy these kinds of capabilities, but they  
11      can't -- they can't provide a real-time  
12      dashboard if they don't have access to the  
13      usage data in real time.

14                   And they can't do demand response  
15      kinds of capabilities where the consumer  
16      responds to some event in the grid, such as  
17      peak demand or some outage, unless they have  
18      some sort of signal coming from the utility  
19      that allows them to respond to a demand  
20      response situation.

21                   So these solutions are available.  
22      They can be deployed, but what we have seen is

1 that the solution providers need access to  
2 real-time usage data directly from the meter,  
3 and pricing signals over the web directly from  
4 the utility.

5 And you make a very good point  
6 with, you know, billions and billions of data  
7 points being backhauled to the network to get  
8 that kind of five-minute visibility,  
9 unfortunately, what we need is kind of five-  
10 second visibility. And so that data -- volume  
11 of data would go up enormously into the  
12 terabytes.

13 And what I think is an alternative  
14 that should be considered is directly reading  
15 the meter, and so that way the user does have  
16 real-time data within a matter of seconds.

17 CHAIR HARRIS: Without having to  
18 backhaul it to the utility.

19 MR. PERRY: And there is no  
20 backhaul required at all. Plus, the lag time  
21 to get to the data. And there are some very  
22 simple ways to read legacy meters. AMR meters

1 are out there. There is a hundred million or  
2 so. So kind of from our point of view, we  
3 look at it from the consumer's standpoint, and  
4 the consumer wants something that is very  
5 simple, utility-free, something they can buy  
6 at Best Buy, and something that is offered  
7 online.

8 CHAIR HARRIS: So just to put a  
9 point on it, whose data is it that is on the  
10 meter?

11 MR. PERRY: Yes. So that's really  
12 the million dollar question, isn't it?

13 MR. INGRAHAM: The meter is owned  
14 by the utility.

15 MR. PERRY: Well, when I -- okay.  
16 We can --

17 CHAIR HARRIS: And the house is  
18 owned by the consumer.

19 MR. INGRAHAM: Right.

20 CHAIR HARRIS: And there we get --

21 MR. PERRY: Yes.

22 CHAIR HARRIS: Let's come back to

1       that point.  So does -- can co-ops play in the  
2       space?  Can you build fiber to the home?  Does  
3       it make any sense for you all?  Can you afford  
4       to roll out smart meters?

5                   I actually get my electricity from  
6       an electric cooperative, and I love my  
7       electric cooperative, but it's a teeny little  
8       electric cooperative.  And when I hear about  
9       fiber to the home, or I hear some of the  
10      things that DTE or Southern are doing, it is  
11      hard to imagine the Virginia Rural Electric  
12      Cooperative doing this stuff.

13                   Jim?

14                   MR. JONES:  Yes.  And part of it I  
15      guess is -- step back a little bit --

16                   CHAIR HARRIS:  And by the way, my  
17      electricity goes out every week.  You know,  
18      it's small, but I love it.

19                   MR. JONES:  That's unfortunate.  
20      Maybe there is the challenges of rural --

21                   CHAIR HARRIS:  Yes.

22                   MR. JONES:  -- services.  Part of

1       it is I guess when we talk about what is smart  
2       grid, and etcetera, what initiative are we on,  
3       I think it is very important to remember that  
4       it is indeed from generation supply through  
5       regional delivery, transmission systems, to  
6       local delivery distribution systems, all the  
7       way to the end, to the meters, perhaps and  
8       beyond.

9                 The term "smart grid" has come up  
10       the last few years really to be focused on  
11       that last portion, the distribution,  
12       engagement of customers, etcetera. In  
13       reality, though, I think we as utilities --  
14       and as Jim is trying to point out -- we are  
15       really concerned about the entire thing.

16                CHAIR HARRIS: Right.

17                MR. JONES: And Great River Energy  
18       in particular is a generation and transmission  
19       cooperative. So we work with generation and  
20       supply, be it renewables or traditional fuels,  
21       whatever that might be. Through a regional  
22       delivery transmission system, through our own

1 transmission substations, I guess and others,  
2 to distribution substations -- that is our  
3 delivery point.

4 We have 28 customers. They are  
5 wholesale customers. We don't have -- Great  
6 River Energy does not have any retail  
7 customers.

8 CHAIR HARRIS: Right.

9 MR. JONES: Our 28 customers take  
10 it from a distribution substation and deliver  
11 it to 640,000 customers. Now, if smart grid  
12 is focused on that last portion, the  
13 distribution portion, one might conclude Great  
14 River Energy has no role in smart grid, and  
15 that is not what we are saying.

16 We do believe -- and I guess it is  
17 we believe that smart grid -- well, I don't  
18 want to use that term -- modern grid perhaps,  
19 Department of Energy, modern grid initiative  
20 really means that whole thing.

21 Along with that, the modern grid  
22 initiative, the original paper was 2030.

1 Recognizing this is decades out, there's a lot  
2 to be done. It is not just technology we have  
3 in hand today that does the customer  
4 engagement component to it.

5           There is an awful lot involved in  
6 making generation more efficient, perhaps more  
7 clean and renewable, distributed, if we can  
8 get to that kind of thing, dispersed, handle  
9 the intermittency, but trying to make the  
10 transmission more efficient and effective as  
11 well.

12           From a Great River Energy  
13 standpoint, though, then, what is our  
14 strategies? We are a cooperative. We are a  
15 community of cooperatives. There is 29  
16 different organizations. We generate the G&T  
17 with 28 distribution cooperatives.

18           We approach it as we want to  
19 invest in technologies that enable the  
20 improvement for all of us, and there is what  
21 we believe are some foundational technologies  
22 that we are capable of today that build and

1 enable and incrementally improve upon to  
2 deliver the actual business benefits of what  
3 is really conceived of from supply to  
4 delivery.

5           Some of the examples -- and a key  
6 strategy there is that it is a community. It  
7 is 29 different organizations. We would  
8 rather invest collectively in one solution  
9 than 29 different solutions -- some -- a few  
10 examples of that, which we have done, by the  
11 way, for years and decades even.

12           We operate a control area, so we  
13 have an energy management system. It pulls in  
14 tens of thousands of data points every two  
15 seconds. We have one of those. We don't have  
16 29 of those. We have one.

17           We have been doing load  
18 management, which is direct load control,  
19 today called it demand response. We have been  
20 doing that for almost three decades. But we  
21 have one load management control system. We  
22 all share in that investment.

1                   And that points out -- one of the  
2 biggest drivers for us is, how do we do this?  
3 We really want to minimize our investments and  
4 our costs, but still achieve the objectives  
5 and the efficiency effectiveness, reliability,  
6 and not -- specifically, though, when you talk  
7 about smart grid, modern grid, we look at that  
8 as the purpose of that is modernization and  
9 optimization.

10                   The core of that, which is really  
11 the nut of smart, is information.  
12 Optimization is use the information as best we  
13 can, as much of it as we can, to optimize the  
14 actual delivery of that energy system.

15                   Therein though, too, is because it  
16 is about information, which comes from all  
17 over that system, that fault chain,  
18 communications is a core foundational  
19 component of that. It is our most recent  
20 investment to enable this modernization, which  
21 is collectively we have invested in a  
22 communications network, an integrated

1       communications network, which essentially  
2       establishes --

3                   CHAIR HARRIS:  Is it yours, or are  
4       you using commercial companies?

5                   MR. JONES:  We use private first.

6                   CHAIR HARRIS:  Okay.

7                   MR. JONES:  Okay?  And we have  
8       implemented an IP network that connects up all  
9       of our facilities, all of our generation  
10      facilities, all of our offices, all of our  
11      transmission substations, and all of our  
12      distribution substations.  It is an IP-based  
13      communications network.

14                   We did, over the years, we went  
15      out and said, "Well, here is what we conceive  
16      of," you know, several years ago, went to  
17      carriers, say, "What can you do?"  It was --  
18      number one, it didn't exist.  Two, it was  
19      prohibitively expensive.

20                   So we had to get incremental.  How  
21      do we grow into this?  We invested in two  
22      things.  One is a core backhaul network,

1 primary loops and corridors. In Minnesota,  
2 there is 100 independent telephone companies.  
3 We needed almost three dozen of them to build  
4 this network.

5 And, by the way, most of it didn't  
6 exist, the infrastructure wasn't out there.  
7 But we partnered with them, and we partnered  
8 with one carrier who was willing to be the  
9 lead of the consortium. So we have a service  
10 contract with them. They have contracts with  
11 30-some independent telephone companies that  
12 have built out this backhaul network for us.

13 Our sites aren't conveniently at  
14 an intersection of streets. They are not only  
15 rural, but some of them are quite remote.  
16 From there, though -- and that hit up about  
17 100 of our sites. From there, it was, how do  
18 we get to the substations now?

19 What we did, we designed that  
20 backhaul network around towers that could  
21 essentially enable a wireless design that  
22 covered our territory. We cover about 55,000

1 square miles, and we have 60 -- almost 70  
2 tower sites that are on that backhaul network  
3 that then communicate wirelessly over 700  
4 megahertz to our substations.

5 And there again, though, it was,  
6 can we get access to the spectrum? Is it  
7 effective, cost effective, to do that? Do we  
8 have the technology? Again, what we did is we  
9 partnered with a provider, that we essentially  
10 have a network -- a contract for network  
11 service from them, and they acquired the  
12 spectrum license or access to it.

13 They enabled the hardware/software  
14 supply chain, and they, with us, constructed  
15 this network. We are users of it. We don't  
16 own it. We don't own that backhaul network.  
17 We don't own that middle mile, if you will,  
18 network either. We just get service from it.

19 Now again, though, it's -- smart  
20 grid is focused on distribution. We haven't  
21 gotten to that. We have gotten to the  
22 distribution substation --

1 CHAIR HARRIS: Right.

2 MR. JONES: -- which though  
3 backhauls the metering, however much that is  
4 -- and we have got -- not an IP, but broadband  
5 service out there. We can backhaul the meter  
6 readings, whether that is once a month, once  
7 a day, hourly, whatever they need, on demand  
8 type monitoring.

9 Their challenge -- our members'  
10 challenge, though, is to go downline. Our  
11 wireless network enables some of that, cost  
12 effective in a lot of cases, but it -- not for  
13 metering, not to connect, you know, the actual  
14 meter -- the metering system comes with  
15 essentially its own metering infrastructure.

16 We are rural. We average seven  
17 customers a mile. Meshed network is -- you  
18 know, most of it is not wireless. It is just  
19 not going to be.

20 CHAIR HARRIS: Right.

21 MR. JONES: Our line carrier is  
22 really the effective way to go. Most of it is

1 that way. We have gotten some members  
2 recently to start investing in the wireless  
3 and trying it. And I guess we are all hopeful  
4 that that would be the case.

5 I think what -- part of the issue  
6 posed to this group, and inspiring this, and,  
7 you know, particularly around the FCC  
8 directions is, is it private or public? I say  
9 it's not a bipolar issue. There is middle  
10 ground. And I think we approach that very  
11 well, which is it's not, you know, purely give  
12 me your brochure, what service do I want, as  
13 much as we partner with somebody.

14 It doesn't exist in the  
15 territories we want. We don't have the  
16 coverage today that we need. But we partner  
17 with somebody that can build it out for us,  
18 with us.

19 We would love to see more carrier  
20 services in our territory. We don't have  
21 cellular coverage throughout our whole  
22 territory. Big aspects of that, we think,

1 part of the modernization of the delivery  
2 system even includes mobile data for our work  
3 crews, automatic vehicle location, safety  
4 issues, if nothing else.

5 CHAIR HARRIS: Right.

6 MR. JONES: I would love to have  
7 that. I think there is a good role for  
8 cellular service in that. We haven't done it,  
9 because there isn't one cellular service that  
10 covers our territory, and we don't want to  
11 hodgepodge a bunch of them together, let alone  
12 have -- still have huge holes. There's gaps  
13 in our coverage.

14 We are hopeful, though. We don't  
15 intend to build that out. You know, it's not  
16 -- that's not our intent.

17 CHAIR HARRIS: So, Sherman, you  
18 have been sitting there patiently. So you  
19 should know -- and it probably comes as no  
20 shock to you -- when I talk to people about  
21 how quickly smart grid will roll out in its  
22 various iterations, whether it be on one side

1 of the meter or the other, whether it be the  
2 smart meter itself, whether it be everything  
3 else, when everyone says why it is going to be  
4 slower than people would like, they say, "Oh,  
5 it's the regulator's fault."

6 So turning to a regulator, how do  
7 you think about this in terms of cost, in  
8 terms of equity? And jumping back to an issue  
9 that was raised over here, the data, who owns  
10 the data?

11 We can clearly see the utility's  
12 view, which is, "It's my data. I don't  
13 necessarily need to share it." I get that  
14 view. You understand why carriers and others  
15 who have interesting services say, "Well, we  
16 can't do this without the data." How does a  
17 regulator look at the data, and who it belongs  
18 to, and, you know, maybe -- I think it's my  
19 data, but I could be wrong.

20 MR. ELLIOTT: Well, you have a lot  
21 of questions there.

22 (Laughter.)

1 CHAIR HARRIS: Sorry about that.

2 MR. ELLIOTT: First of all --

3 CHAIR HARRIS: None of them are  
4 new to you I bet, though.

5 MR. ELLIOTT: No, they're not.  
6 But I just want to say these are my views,  
7 don't necessarily represent the Illinois  
8 Commerce Commission or my colleagues. And in  
9 the spirit of full disclosure, our industrial-  
10 owned utilities did not get any DOE grant  
11 money for smart grid projects.

12 CHAIR HARRIS: I just want to say  
13 it ain't my fault.

14 MR. ELLIOTT: No, no, no.

15 CHAIR HARRIS: I had nothing to do  
16 with it.

17 (Laughter.)

18 MR. ELLIOTT: Just following the  
19 comments that are --

20 CHAIR HARRIS: Just wanted to be  
21 clear.

22 MR. ELLIOTT: Sure. We are

1 engaged on a number of fronts in the smart  
2 grid space. We have a statewide collaborative  
3 that has been initiated, that has been ongoing  
4 for quite some time, being facilitated by Eric  
5 Gunther and Rick Warrenet from Internex.

6 And we have got some players that  
7 are engaged, particularly on the telecom side,  
8 but I spent a lot of time trying to coerce  
9 people to come and join the dialogue. I think  
10 for the most part when this started out a  
11 couple of years ago I think the utilities just  
12 were keen on this buildout completely of their  
13 own.

14 For all of the reasons that you  
15 spoke about at the very beginning, security  
16 and reliability -- now I think that there is  
17 much more interest from the telecommunications  
18 carriers. I think at the beginning they  
19 didn't see much in the way of data usage,  
20 capacity, consumption here. If you are going  
21 to ping a meter once a day --

22 CHAIR HARRIS: Who cares?

1 MR. ELLIOTT: Yes, it doesn't get  
2 into the revenue stream. But I think a lot of  
3 the things that we have talked about here are  
4 coming faster than any of us are prepared to  
5 accommodate.

6 I know all of the major appliance  
7 manufacturers have stated that they are going  
8 to have smart controllers in their durable  
9 goods coming out in the next few years.  
10 PHEVs, electric vehicles, are coming out the  
11 fall of this year.

12 Products are making it into the  
13 stream, and we don't have the functionality in  
14 our systems to really accommodate them. As  
15 you said, clustering of electric vehicles in  
16 a cul-de-sac is going to create significant  
17 distribution system problems.

18 And there are regulatory issues  
19 that need to be addressed. Unfortunately, the  
20 regulatory process doesn't operate as nimbly  
21 and as quickly as technology does. For  
22 example, a rate proceeding to engage in

1 recovery of these investments that a utility  
2 would come before the Commerce Commission in,  
3 it takes 11 months in general to discuss this.

4 We have been -- directed the  
5 parties to engage in a collaborative to try  
6 and see if they could, prior to the formal  
7 filing, solve some of these issues on an  
8 informal basis, and hopefully that is  
9 encouraging, what we have seen so far.

10 But at the end of the day, if  
11 there isn't an agreement between a utility and  
12 a carrier to do the public -- and if they  
13 decide to do it on their own, that's the  
14 filing that they are going to make before the  
15 ICC.

16 The problem there becomes one of  
17 cost and benefits. How do I make a  
18 determination, what is the least cost option,  
19 if I don't have all of the alternatives  
20 available to me, and the only way that I can  
21 make a decision is based upon the record  
22 evidence before me.

1           So if I don't have all of these  
2 carriers coming in and saying, "I can do it  
3 cheaper. Let me show you how. Here is the  
4 evidence to prove it," then, what is the least  
5 cost solution?

6           And so this type of information,  
7 this type of dialogue I think is extremely  
8 important for regulators. As an economist,  
9 which is my background, I can easily state,  
10 you know, without reservation that having an  
11 additional communications input to the home,  
12 if we already have two or three, whether it's  
13 wireless or cable or a landline, or U-verse or  
14 Verizon, whatever the case may be, customers  
15 can opt to change, switch, and obviously they  
16 do.

17           I don't know what the churn is in  
18 the industry, but -- so to have another port  
19 of entry for communications doesn't seem to be  
20 productive to me as an economist. And I look  
21 --

22           CHAIR HARRIS: What about -- my

1 former FCC hat, what about competition?

2 MR. ELLIOTT: Well, I can  
3 understand that, and I agree with it. I'm  
4 familiar with the third entry.

5 (Laughter.)

6 But, you know, we've concentrated  
7 on the electric industry here. I think the  
8 gas industry is probably three years down the  
9 road with smart meters. I know GTI --

10 CHAIR HARRIS: Good point.

11 MR. ELLIOTT: -- is working on  
12 them.

13 CHAIR HARRIS: Right.

14 MR. ELLIOTT: They don't have the  
15 electrical capability, so they are going to  
16 have to piggyback on something, or they could  
17 possibly build their own similar to what the  
18 electric companies are saying.

19 Behind that are the munies, who  
20 have the water services. Now, if everybody  
21 decides to engage on this and build their own  
22 networks, we are going to have a lot of I

1 think very skinny pipes coming into the home,  
2 and I think we are losing economically on what  
3 one fat pipe can do, and what people can  
4 carry.

5 Now, I'm not -- I agree that there  
6 isn't one solution. We have a lot of rural  
7 areas, even within utility jurisdictions. So  
8 the topology isn't going to fit one solution.  
9 But I think, you know, what we should be  
10 looking at from a policy perspective is: what  
11 already exists? What can we leverage, at  
12 least in the last mile? And what are the --  
13 we should drill into that and say, "Is the  
14 capacity sufficient? Is the latency  
15 sufficient? What are we trying to do?"

16 And don't build a weak  
17 communication link that can ping a meter once  
18 a day when really what we want to do is have  
19 the PHEV talking to the bulk power control  
20 system on a second-to-second basis for  
21 ancillary services. So we need to determine  
22 what the latency capacity -- and then see what

1 is out there, leverage what we've got, from my  
2 perspective, partner with who we can, and  
3 provide the least cost solution that offers  
4 the reliability and security that we are all  
5 looking for.

6 CHAIR HARRIS: Go ahead.

7 MR. ELLIOTT: And one other point.  
8 We are all talking about this, but the  
9 residential consumers aren't. Most of them  
10 have no idea what we are talking about today.  
11 I think the last survey I saw was 68 percent  
12 have no concept of this.

13 So, as a regulator, I am going to  
14 get that pushed back. And from your FCC  
15 background, you will recall that all we wanted  
16 was that rotary dial black phone. We didn't  
17 need that digital switch. All I want is my  
18 plots.

19 If you remember those days --

20 CHAIR HARRIS: I don't. I'm not  
21 that old.

22 (Laughter.)

1 MR. ELLIOTT: But that is the same  
2 -- that is the situation we're in today.

3 CHAIR HARRIS: But then, so -- but  
4 until they saw the iPhone, right, I mean,  
5 there was -- the killer -- the concept of the  
6 killer app. I mean, one of the things that I  
7 find interesting -- and when people talk about  
8 smart grid, they often talk about 2030, 2040,  
9 and I sort of thing like, a) I'll be dead  
10 then, and so it's not so interesting to talk  
11 about, and b) how can that be right.

12 So I went to the FCC in 1994. The  
13 day I started I talked to the then-head of  
14 NTI, who told me about this new software  
15 program he just ran into called Mosaic, right?  
16 It was the first browser. And he could do  
17 something really cool, he told me. You could  
18 actually sit at your desk and see a picture of  
19 the Mona Lisa in the Louvre in digital format.  
20 I went to do that and clicked -- you know, it  
21 actually wasn't very interesting, right? But  
22 you could do it.

1                   And that wasn't so long ago. And  
2                   now we're talking IPTV, we're talking YouTube,  
3                   we're talking Hulu, we're talking iPhones,  
4                   we're talking iPads. That's half the time  
5                   people are talking about smart grid.

6                   And I think people think, well,  
7                   look, consumers are not interested, and,  
8                   therefore, this will take forever, because  
9                   only utilities are interested, and maybe the  
10                  primary interest is reliability and consumers  
11                  pretty much think their electricity is  
12                  reliable anyway, so who cares?

13                  But isn't it possible, isn't it  
14                  likely, that the first Whirlpool refrigerator  
15                  that does something cool, if it can be  
16                  interactive with the network, or the electric  
17                  cars start to take off, can't -- isn't that  
18                  likely to drive this in half the time people  
19                  are talking about? I just can't believe the  
20                  telecom sector operates, you know, every six  
21                  months a new product. And for the next 20 or  
22                  30 years, the electric sector is going to go

1 at a glacial pace.

2 Lynne, I mean, that -- am I missing  
3 -- I could be missing something entirely. I  
4 can see this. But I am curious about it.

5 MS. ELLYN: Okay. I need to let  
6 you know that I was at Netscape --

7 (Laughter.)

8 -- the eight consecutive quarters  
9 we doubled in size, and invented the term  
10 "killer app." So, and I worked at Xerox when  
11 we had the largest IP networks, and most  
12 companies hadn't even heard of IP.

13 So I'm not primarily a utility  
14 person. I am primarily a technologist. So I  
15 am going to say, first of all, when we talk  
16 about the smart grid, if we could understand  
17 the grid that moves electricity around is, by  
18 its nature, entirely different than the grid  
19 that moves phone calls around or consumer  
20 products. And until we understand this  
21 difference, we are going to make some bad  
22 decisions.

1           I think most -- most of the energy  
2 industry leaders that I meet are happy to have  
3 all of these great gadgets come to the home  
4 and all of that happen. Nobody wants to stand  
5 in the way of it. And I would say that the  
6 majority believe we collect the data in order  
7 to effectively run and deliver power. And if  
8 the customer wants us to provide that data,  
9 the customer probably has the right to ask for  
10 that.

11           I think, you know, you may get a  
12 range of views, but the centrist view is  
13 pretty much we're okay with that. But we  
14 throw around buzz words like "clouds." Clouds  
15 are just somebody else's data center, and all  
16 data centers have the same characteristics.

17           They are subject to cyber attack,  
18 they are subject to operational issues, they  
19 need power and whatever. Moving into the  
20 cloud just means somebody else may be worrying  
21 about it, and hopefully they do that worrying  
22 more effectively than you can do for yourself.

1                   But these buzz words don't  
2 actually help with the very real issues, and  
3 regulators have this issue. As much as we all  
4 want green energy, compared to the price of  
5 what we regard as non-green energy, it is  
6 unaffordable. But we are going to do it  
7 anyway, because it is the right thing to do.

8                   It is going to increase --

9                   CHAIR HARRIS: Unaffordable,  
10 excluding externalities. Is that the right  
11 word?

12                  PARTICIPANT: That is the right  
13 word.

14                  CHAIR HARRIS: Okay.

15                  MS. ELLYN: But from the  
16 customer's point of view -- and you look at a  
17 city like Detroit, which has been economically  
18 devastated, and customers can't pay their  
19 bill, increasing the bill is a serious social  
20 issue.

21                  We have 60-year-old powerplants.  
22 They aren't going to last forever. They must

1 be replaced. This is going to be expensive.  
2 Whether your choice of fuel is natural gas,  
3 whether your choice of fuel is nuclear, this  
4 requires huge investments, not to even mention  
5 that the physics of managing all of these  
6 different kinds of power and delivering it  
7 reliably is something that most of us in the  
8 room aren't capable to fully grasp that. We  
9 can observe it, we can be part of it, but it's  
10 pretty tricky.

11 One thing that differs between  
12 communications and the delivery of electrons  
13 to your home, the communications network is  
14 highly redundant. Highly redundant. But that  
15 last mile to you is not. It is physical, it  
16 is subject to weather, it is subject to all  
17 sorts of things that make the business of  
18 managing the grid, which is -- when we think  
19 of the grid it is getting that electron to you  
20 when you want it, as primary.

21 Now, the issues of pricing this or  
22 pricing signals, easy enough for utilities to

1 create time of day pricing, which is pretty  
2 close, and it's a chart. I mean, it's the  
3 chart. You know that on a hot August day  
4 during these hours it is going to cost more.  
5 That would be a reasonable thing to do, and  
6 wouldn't require quite the investment in  
7 technology. If we --

8 CHAIR HARRIS: Can I ask you a  
9 question? See if I understand where -- are  
10 you suggesting -- and I might be  
11 misunderstanding -- that in terms of smart  
12 grid we don't need necessarily to accomplish  
13 the key goals, all of the bells and whistles  
14 that I might be thinking about, or others may  
15 be thinking about, in terms of sort of the  
16 iPhone vision of the smart grid? That, you  
17 know, if we are using the data basically for  
18 reliability purposes, for helping with price  
19 signaling, and things like that, that is good  
20 enough and that --

21 MS. ELLYN: No.

22 CHAIR HARRIS: Okay.

1 MS. ELLYN: No. I believe that  
2 the tech industry, which I have worked in, can  
3 work within some reasonable constraints to  
4 produce all those marvelous gadgets without  
5 embedding huge costs on the utility side,  
6 because if we have to build the billing  
7 systems -- billing systems in a large utility  
8 can be \$100- to \$200 million to build because  
9 of all the rates and all the issues.

10 We have to build new billing  
11 systems. If we have to build new networks for  
12 transmitting this, and I have to give the  
13 cable company one format, and I've got to give  
14 Google another, and this is going to be cost  
15 that is passed on to the consumer.

16 Now, we will be glad to build it  
17 if the people who are going to make money on  
18 it want to pay us for doing that. But to just  
19 embed it into the consumer cost seems wrong-  
20 headed.

21 My point of view -- and I think  
22 you would find this pervasive in the utility

1 industry -- given that consumers do in fact  
2 affirmatively want this, and I think the jury  
3 is still out, there is plenty of evidence on  
4 the other side -- we can provide that  
5 information, relevant information.

6 And on the other side of the  
7 meter, I was just at a tradeshow. Becky and  
8 I were both there. This stuff already exists.  
9 You want to know how much power your  
10 appliances are using, and you want to program  
11 something to turn them off and on? It's  
12 available. We don't have to load up, inside  
13 the utility, additional costs when we know we  
14 have very real infrastructure costs.

15 CHAIR HARRIS: So your argument  
16 basically is that these two visions can co-  
17 exist --

18 MS. ELLYN: Absolutely.

19 CHAIR HARRIS: -- of the smart  
20 grid, but the utilities don't need to deal  
21 with it all. They can essentially pass it  
22 off, if you will, maybe at the meter or what,

1 to other companies which can provide the "gee  
2 whiz" kinds of services and appliances and  
3 apps and things like that. Is that basically  
4 the --

5 MS. ELLYN: Some --

6 CHAIR HARRIS: -- and, therefore,  
7 keep the cost down, and maybe solve some of  
8 Sherman's concerns.

9 MS. ELLYN: Some simple safe  
10 method would be we just push it to a website,  
11 what the cost is. You come and get it. Use  
12 it for anything you want. And that we could  
13 do inexpensively and safely, and we wouldn't  
14 be worried about whether your Whirlpool  
15 refrigerator had a virus that was affecting  
16 meter performance. And, believe me, we are  
17 going to have to worry about this.

18 CHAIR HARRIS: Jim, I saw you.

19 MR. INGRAHAM: Yes. You know, I  
20 think one of the things we don't want to lose  
21 sight of here is, where does the value come  
22 from? Where does the money come from at the

1 end of the day?

2 CHAIR HARRIS: Right.

3 MR. INGRAHAM: And in our case, if  
4 you -- we asked people in Chattanooga a lot of  
5 questions, and Sherman is exactly right, the  
6 public has almost no concept of this. They  
7 tell us -- when we say how fast we are at  
8 restoring power when it goes off, so what?

9 (Laughter.)

10 I didn't want it to go off in the  
11 first place.

12 (Laughter.)

13 CHAIR HARRIS: Right.

14 MR. INGRAHAM: And they don't care  
15 how fast you are.

16 CHAIR HARRIS: Right.

17 MR. INGRAHAM: Okay? When we get  
18 into telling people -- we are putting new  
19 meters on everybody's homes today, and we are  
20 doing everything in the world we can to  
21 communicate with them about, when you get  
22 home, your digital clock is going to be

1 flashing, because, you know, we unplugged one  
2 meter, and we put a collar on, and put another  
3 meter -- why are you doing that? How much  
4 does that cost me?

5 And at the end of the day, yes,  
6 the technologies are out there to manage this  
7 data. But to manage the volumes of it I'm  
8 talking about, and to package them in a way  
9 that is acceptable to the bulk power markets,  
10 that's where the money comes from.

11 CHAIR HARRIS: Right.

12 MR. INGRAHAM: And you have got to  
13 be able to -- you know, Tennessee Valley  
14 Authority today is buying a lot of wind power  
15 from the Midwest. Do you know what time the  
16 windmills start turning?

17 CHAIR HARRIS: Not a clue,  
18 actually.

19 MR. INGRAHAM: Three o'clock in  
20 the morning. Not exactly a peak time for  
21 energy demand.

22 CHAIR HARRIS: Right.

1 MR. INGRAHAM: Okay? So if we are  
2 in a position to turn on water heaters at 3:00  
3 in the morning, instead of waiting until 6:00  
4 when people are getting up and getting ready  
5 for work, there is economic value to the  
6 generator in that.

7 And the wall we've got to get over  
8 is proving that that power is reliable enough  
9 for the big utilities' capacity planning,  
10 because it is the capacity value of the energy  
11 that if the consumer can't get a fair piece of  
12 that capacity value, this never really pays  
13 for itself at the end of the day. If it's  
14 just the energy value of the power, you never  
15 really get there except on a very few hours  
16 every year.

17 And that is really -- at the end  
18 of the day, proving that reliability to the  
19 generator -- and that is kind of where our  
20 focus is in Chattanooga. TVA is getting ready  
21 to build a nuclear plant -- \$3,000 a kilowatt  
22 hour. Okay? They are offering our customers

1       today \$150 a kilowatt hour for any kind of  
2       demand response load. That's about \$2 a  
3       month. Okay?

4                   It's hard to get people interested  
5       in \$2 a month of value. Nobody wants to be,  
6       in Chattanooga at least -- less than one in 10  
7       of our consumers want to be an energy manager,  
8       want to be looking -- I love my iPhone, but  
9       they don't want to be looking at it and  
10      saying, do I want to -- you know, how much do  
11      I want today or tomorrow or the next hour or  
12      the next week or the next month?

13                   They want convenience, they want  
14      reliability, they want comfort, and they are  
15      consumers. I mean, we are all Americans, we  
16      consume. And they want to consume. They  
17      don't want to be put in a rationing position  
18      or having to, you know, to play this energy  
19      marketing kind of a role.

20                   That is why we are kind of --

21                   CHAIR HARRIS: On the other hand,  
22      I don't really care when my hot water meter

1 goes on, as long as when I take a shower it's  
2 hot.

3 MR. INGRAHAM: Well, and you can  
4 also predict when people are in or out, and  
5 you can turn their air conditioners up and  
6 down two or three degrees remotely, and you  
7 can turn their pool pumps on remotely.

8 And like you guys have been  
9 talking about the new kitchen appliances, and  
10 they will read either ZigBee or 900 megahertz  
11 off the meter, they will read a price signal,  
12 and if prices are up, well, the dryer will  
13 only heat one of the two elements up, and it  
14 will take 65 minutes instead of 45 minutes to  
15 dry that load of clothes. But you should get  
16 a credit back from the power company when you  
17 do that.

18 CHAIR HARRIS: Absolutely.

19 MR. INGRAHAM: Which makes our  
20 billing systems much more complicated than  
21 they are today.

22 CHAIR HARRIS: Right.

1 MR. INGRAHAM: So, you know, I  
2 guess from our perspective, we wouldn't have  
3 an argument with anyone who wanted to provide  
4 those services inside the home area network,  
5 but the issue is, at the end of the day, those  
6 kilowatts have got to be proven to be reliably  
7 delivered to the generators, because Lynne is  
8 exactly right. Our generation in this country  
9 is in dire need of a major rebuild.

10 CHAIR HARRIS: Absolutely.  
11 Absolutely.

12 Michael, we haven't heard from you  
13 in a bit.

14 MR. LANMAN: Yes, I just wanted to  
15 comment that I think, you know, we are  
16 agreeing more than we are disagreeing around  
17 the table, because, as we approach the  
18 opportunity with the smart grid, it is about  
19 return on investment model, purely.

20 So when we come to our utility  
21 partners or, you know, in other industries as  
22 well, the message to them is, let us show you

1 a model as to how we can free up your capital  
2 dollars to invest back in the grid, as opposed  
3 to investing in communications.

4 And by the way, I understand,  
5 Becky, very clearly your concerns around  
6 reliability, and that's why we know we need to  
7 make sure that we've got the reliability and  
8 the security that you demand.

9 And that is what our business is  
10 really about today is building the networks to  
11 be reliable, and building them to be secure,  
12 applying your security policies against our --  
13 the network we deliver to you, but freeing up  
14 your capital dollars to go where I think they  
15 are better spent.

16 The communications network is who  
17 we are. It is about what we do every day. We  
18 are passionate about it, and the likelihood of  
19 us being up on the latest technology and being  
20 able to support a communications network more  
21 effectively than a utility might be able to,  
22 or a core competency to deliver that

1       communications network, I think that -- you  
2       know, that's what -- the conversation we'd  
3       like to have, and not in the, you know, public  
4       forum, but one on one with the CIOs of the  
5       energy companies, to understand how we can  
6       best serve them. And that's exactly, you  
7       know, what we have been doing.

8                 So I think the process is working  
9       in many situations, because we have got the  
10      right level of dialogue. And our changes at  
11      Verizon were to create an even higher level of  
12      dialogue with our key utility partners. Where  
13      we can use some help is if you look in -- to  
14      the regulatory bodies.

15                One of the key concerns of the  
16      utilities has been around priority access in  
17      times of critical need, and we have gotten  
18      standards put in place for voice  
19      communications, but they don't exist today for  
20      data communications. And we need to get those  
21      standards escalated through the FCC, so that  
22      we've got -- so we can meet your needs in that

1 area during critical times.

2 So one thing we can all definitely  
3 work together on is, you know, getting the  
4 regulators to execute quickly around --

5 CHAIR HARRIS: I knew they were  
6 going to blame regulators before we ended.

7 (Laughter.)

8 Becky, so are you convinced that  
9 Michael is doing more in terms of reliability,  
10 that you all should actually go out and have  
11 lunch and talk about, you know, what kinds  
12 of --

13 MS. BLALOCK: I mean, we want to  
14 partner with public carriers. We know we  
15 can't build everything out that has got to be  
16 built on our own. That's why we have chosen  
17 public carriers to do the backhaul on our AMI.  
18 We are not trying to do that ourselves. But  
19 reliability is going to be a huge issue.

20 You know, we look at everything,  
21 and what we want to try to do is do everything  
22 in the most cost effective manner that we can

1 for our customers. In many instances, it is  
2 the public carriers that can do it cheaper.  
3 I mean, if we don't have to build a line out  
4 to a local office, and we can get it from you  
5 more affordably than we can ourselves, then we  
6 try to give it to you.

7 But reliability is a huge issue,  
8 and I don't think that the public carriers are  
9 there today. That's not to say that  
10 technology is not advancing and things aren't  
11 changing rapidly, but the eight-hour outage  
12 that I had on Friday -- a great example of the  
13 fact that the reliability is not there.

14 I have a very diverse terrain that  
15 I have to serve. Part of my territory is very  
16 rural as well as -- just like yours is, Jim,  
17 and I have also got a very dense population  
18 that I have to serve with many high buildings  
19 in the city of Atlanta. So we have to have a  
20 variety of options for how we end up doing  
21 this.

22 Back to this discussion behind the

1 meter, I am really with Lynne that I don't  
2 know that utilities are going to do a lot of  
3 that. Some utilities are putting home area  
4 networks into the meters that they are putting  
5 out there. And some do have the vision that  
6 they are going to own what is going on in the  
7 home.

8 I think there is a lot that is  
9 going to be settled out in the next five to 10  
10 years in terms of who actually does that. It  
11 may be that some utilities are going to do  
12 that. I heard some of the things that Jim is  
13 doing that I think are great. Those are not  
14 things that we could cost justify or make  
15 sense for us as a business.

16 We are -- our core business is  
17 generating and delivering electricity, and we  
18 do that very, very well. As Lynne mentioned,  
19 it is really remarkable the reliability and  
20 the ability that we have in this country to  
21 generate power. We are the world's best. We  
22 are the envy of the world in terms of what we

1 can do, and I think people take that for  
2 granted, because they don't really understand  
3 all the complexity that goes on.

4 It is truly just-in-time delivery.  
5 And the analytics you have to have to be able  
6 to monitor your network and make sure that you  
7 are delivering in a timely fashion, and not  
8 doing anything that is going to disrupt that  
9 network, is nothing short of just a tremendous  
10 engineering feat and something not to be taken  
11 lightly.

12 But that's not to say that all  
13 utilities have this vision that they are going  
14 to go and do all these things in the home.  
15 Well, we are going to look for partners,  
16 because what we want to do -- the customer is  
17 the center of everything that we do, in my  
18 company and in most of the utilities in our  
19 industry.

20 And, you know, anything we can do  
21 to partner with somebody, or if we can do  
22 things more effectively, and customers want

1       that, and there is a business case for it,  
2       then we will evaluate that. But right now our  
3       major focus is on continuing to deliver power  
4       and doing that reliably.

5                   And we have -- the reason we have  
6       put the AMI network out there, really, was to  
7       read meters, because we could save our  
8       customers money.

9                   CHAIR HARRIS: Okay. With that,  
10       let me see, do we have any members of the  
11       audience who would like to ask questions, make  
12       a statement, participate in the discussion in  
13       any form or fashion? Then, now would be a  
14       good time to do so.

15                   (No response.)

16                   Look, I know a lot of you guys.  
17       You must have something to say.

18                   (Laughter.)

19                   Really? Okay. Well, we can keep  
20       going.

21                   MR. ELLIOTT: If I can offer a  
22       couple of points.

1 CHAIR HARRIS: Yes.

2 MR. ELLIOTT: I didn't touch on  
3 the --

4 CHAIR HARRIS: Russell, I am very  
5 disappointed.

6 (Laughter.)

7 MR. ELLIOTT: The customer data  
8 issue -- for example, providing the  
9 consumption data in real time. That is part  
10 of the issue. I mean, if you had the  
11 commodity cost and a real-time rate, that's  
12 only part of the bill. And a lot of the bill  
13 resides in the customer information systems  
14 within the utility.

15 So can the customer legitimately  
16 pull out what they need? I mean, yes, maybe  
17 on the pure commodity portion, but it doesn't  
18 really give them a sense of what their bill is  
19 actually comprised of in terms of taxes and  
20 other issues that -- I suppose it could be  
21 generated, but it's more complicated than just  
22 pulling the consumption data off the meter,

1 for one thing.

2 The other key point that Jim  
3 raised I think is the capacity energy issue.  
4 We have real-time pricing rates available in  
5 Illinois, about 20,000 customers on them, and  
6 for the most part it is operated purely on  
7 energy. It is the energy prices in the  
8 respective RTOs, PJM, and MISO.

9 The capacity costs aren't  
10 recovered on an hourly basis. It's not an  
11 energy-only market. There are significant  
12 caps and barriers and different issues going  
13 on there that really don't generate the  
14 pricing and the value to the end use customer.

15 That can be automated by a number  
16 of functionalities that currently exist today  
17 that are on the market and capable of  
18 delivering this, but trying to determine the  
19 value and the return on the investment to make  
20 that commitment without that type of pricing,  
21 where the capacity costs are recovered in the  
22 hours where they are consumed.

1                   So that complicates the issue even  
2                   greater, particularly now in the economic  
3                   downturn when prices have dropped and we don't  
4                   have the differential between peak and off-  
5                   peak that would necessarily do that. But we  
6                   can still have periods of constraint.

7                   So I think there are some issues  
8                   on wholesale pricing matters that need to be  
9                   resolved in order to get that price down to  
10                  the retail customer and to see that reaction  
11                  and the delivery of that information.

12                  And whether the -- all those data  
13                  points are aggregated by the utility, a third  
14                  party, how it gets back to the RTO, and how  
15                  the billing and settlement issues get back and  
16                  forth, those are going to be complicated  
17                  issues, and there are going to be an awful lot  
18                  of data points and the need for an awful lot  
19                  of aggregation and automation.

20                  MS. BLALOCK: You know, one thing  
21                  I think you have to be very careful of is the  
22                  fact that I believe the argument will settle

1 out that the customer owns that data. I can't  
2 say that that has fully been fleshed out, but  
3 a lot of people are going to not want somebody  
4 to own that data. People have access to your  
5 energy information. They know if you are at  
6 home.

7 MR. ELLIOTT: Oh, yes. No, I  
8 think there are security issues. There's no  
9 question about it.

10 MS. BLALOCK: Well, I think that  
11 that argument has got a long way to go.

12 MR. INGRAHAM: I think our -- from  
13 our perspective, we are preparing to enter  
14 into contracts with all of our customers that  
15 are on time of use, critical peak, direct load  
16 control arrangements, where we will clearly  
17 define what the terms are that we can use that  
18 data, or that they can share it with someone  
19 else. And we are working on that today.

20 CHAIR HARRIS: And if your  
21 customer wants to share the data with others,  
22 that's cool with you. You just want to make

1       sure you are protected.

2                   MR. INGRAHAM:  When someone uses  
3       their -- yes.  We wouldn't try to control  
4       that.  Now, where it comes to billing them for  
5       their, you know, basic electric use, we need  
6       access to that data, obviously.

7                   CHAIR HARRIS:  Right.

8                   MR. INGRAHAM:  We even get into  
9       issues with the Tennessee Valley Authority --  
10      that is our wholesaler -- that, you know, they  
11      would like to be able to see all the way to  
12      that meter in real time.  Well, that's all  
13      well and good, but control -- you know, the  
14      relationship with the customer has value, and,  
15      I mean, we all ought to recognize that.

16                  CHAIR HARRIS:  Absolutely.

17                  MR. INGRAHAM:  And so, you know,  
18      from our perspective, it is very, very  
19      important to us that we are able to offer  
20      products to them that are competitive.  We are  
21      thinking about -- as Becky said, we are  
22      looking at our own solutions for home area

1 networks, but we have designed our solution,  
2 because there is really not a good standard  
3 for the home area network yet, that literally  
4 any of the appliances -- whatever technology  
5 -- whatever communications protocols they work  
6 off of will work, but we think that there is  
7 a new power contract beyond just the monthly  
8 billing arrangement we enter into with our  
9 customers today, credit arrangement.

10 CHAIR HARRIS: Right.

11 MR. INGRAHAM: And that is an  
12 important part of this.

13 CHAIR HARRIS: Good.

14 Russell, I didn't mean, really, to  
15 embarrass you into making --

16 MR. FRISBY: That's okay. Now  
17 that you did make the offer, I do want to  
18 follow up on something. There has been a lot  
19 of discussion around the table about real  
20 time, and -- but I know there is a debate  
21 within the industry, particularly the  
22 electricity industry, about whether real time

1 can actually be real, and problems with the  
2 cost of installing real-time meters, and  
3 whether you should be talking about 15-minute  
4 intervals, and whether it is realistic to  
5 transmit raw data on a real-time basis.

6 But I -- that really has -- the  
7 technical aspects of real time and whether it  
8 is possible really haven't been discussed, and  
9 I was wondering if any of the panelists had  
10 any views on the technical aspects.

11 MS. ELLYN: I would like to take  
12 that on, because we are looking -- a number of  
13 us in our industry are looking at, if we were  
14 compelled to do this, what would it cost? And  
15 the jumping off points are maybe \$100 million  
16 of capital investment, maybe more.

17 And here is something we need to  
18 think about. In our first rollouts, we pulled  
19 meters out that had been installed in 1937 and  
20 were still working fine. I am a technologist.  
21 I throw away my technology about every three  
22 or four years, and I'll bet you do, too.

1           The cost of meters and the cost of  
2 all this upgrade is not insignificant. And if  
3 we are going to have to keep replacing this  
4 for bigger and bigger pipes, and bigger and  
5 bigger bandwidth, in order to get to real-time  
6 data, this is going to be a very large cost.

7           And I would say those that benefit  
8 from that data need to share in the cost of  
9 it, not just hand it over to our customers as  
10 an embedded cost.

11           The other thing that is going to  
12 be critical about this, the ongoing expense of  
13 maintaining it. I run a large IT  
14 organization. Everything is easy when you  
15 don't know very much about it. But when you  
16 do know very much about it, it is seven by 24,  
17 and there's a lot of headaches.

18           And we have brushed on the  
19 security. We could be here two weeks talking  
20 about the security implications of having big  
21 pipes with two-way communication running  
22 around here. So I think we need to think

1 about moving into this kind of automation,  
2 where the most value is for the consumer, the  
3 most value is for moving to greener sources of  
4 energy, and the most value is to reliable  
5 power.

6 There is plenty of opportunity to  
7 do wondrous things for the consumer without  
8 embedding the enormous cost of real-time  
9 communications into this at mass level. You  
10 know, we can do it for one little thing, but  
11 to try to do it for all -- millions and  
12 millions of meters, all the time, seven by 24,  
13 this is staggering as complex and costly.

14 MR. McSLARROW: Well, as  
15 distinguished from managing the grid itself.

16 MS. ELLYN: Absolutely. It is a  
17 whole --

18 MR. McSLARROW: I agree with that.

19 MS. ELLYN: It is like a -- we are  
20 going to double the size of our cost of  
21 managing, because we are going to have another  
22 real-time grid.

1 MR. McSLARROW: Yes.

2 MS. ELLYN: I think that all the  
3 things the telecommunication companies, the  
4 cable companies want to do, they can do and  
5 bring real value into the home, and delight us  
6 all with new and creative things without  
7 requiring that. And if it is required, then  
8 they need to help pay for it.

9 CHAIR HARRIS: Roy, I see heated  
10 agreement over there, I think?

11 MR. PERRY: Well, I've been trying  
12 to solve this problem for a couple of years,  
13 how to read my own meter and do my own real-  
14 time monitoring. And there are solutions that  
15 you can do that today, zero cost to the  
16 utility, you can get real-time data off the  
17 meter -- not off the meter, you can get real-  
18 time whole home data.

19 And I think it's important -- let  
20 me just back up a little bit -- to separate --  
21 I think we need to separate the supply of  
22 electricity for the demand electricity and

1       have two different policy domains. That  
2       implies a DMARK -- that's the meter -- and  
3       within the supply side there needs to be  
4       robust, hardened communications networks that,  
5       you know, assure reliable supply.

6                   On the consumer side, much like we  
7       started out with Carter Phone how many years  
8       ago -- you probably don't remember that, you  
9       are too young for that.

10                   (Laughter.)

11                   That opened up a whole world --

12                   CHAIR HARRIS: Russell is old  
13       enough to remember.

14                   MR. PERRY: That opened up a whole  
15       world of competition for CPE, and we never  
16       looked back to PBXs and phones and fax  
17       machines and what not.

18                   So there is a small company in the  
19       UK that provides an energy management  
20       solution, and it gives real-time feedback  
21       dashboard to the user, and it does that with  
22       a clamp-on device that goes onto the main.

1 And in the UK, the meters are typically inside  
2 the flat, and you have access to that main.  
3 It's a single lead, so you can clamp on that  
4 end meter and it reports usage back to the  
5 system.

6 So that is zero utility  
7 involvement, zero utility cost. The consumer  
8 can do that themselves. And what is also  
9 interesting about this solution is that they  
10 -- and I think that is what is -- the other  
11 huge piece that is missing is the consumer  
12 demand for this.

13 If we created enough consumer  
14 interest and demand to manage your energy,  
15 everything would take care of itself. The  
16 market would take care of itself, the products  
17 would take care of themselves. We wouldn't  
18 need to be here today if there was, you know,  
19 enormous demand on the consumer side.

20 So what they have done is they  
21 have tapped into the Prius effect, and that is  
22 that to -- you need to inspire consumers. You

1 can't just say, "Hey, save \$3 a month." What  
2 they have is a social networking framework  
3 where you can see how you are doing relative  
4 to your neighbors, you can see how --

5 CHAIR HARRIS: Well, that's a  
6 little creepy.

7 MR. PERRY: -- see how your  
8 neighborhood is doing relative to other  
9 neighborhoods, see how your city is doing  
10 relative to other cities. They have created  
11 this social feedback mechanism where they have  
12 got all these people jumping on board to  
13 compete with your neighborhood, compete with  
14 your neighbor. They've got award programs and  
15 things like that.

16 And what is happening is they are  
17 now turning to the utility commission -- I  
18 don't know what they call it in the UK -- and  
19 saying, "Look at what we have done over here.  
20 We have saved ten zillion" -- I don't know  
21 what the number is, millions of kilowatt hours  
22 -- without any utility involvement whatsoever.

1                   And we could lower the price of  
2                   the solution dramatically, if we didn't have  
3                   to clamp onto that main and transmit that  
4                   back. And if you gave us access to the meter  
5                   data in real time, then we would be able to  
6                   drop the price of the solution, we would be  
7                   able to expand it to very many more people,  
8                   because the costs would be much lower. The  
9                   entry cost right now is about 49 euro to get  
10                  the basic system.

11                  And we would be able to have  
12                  dramatic effects on the demand side for  
13                  electrical consumption in the country. And  
14                  they are really getting a lot of -- they are  
15                  really getting a lot of attention because of  
16                  that, because they have solved the demand side  
17                  of the problem using social networking --

18                  MR. ELLIOTT: What is the  
19                  underlying rate that they're facing?

20                  MR. PERRY: I'm sorry?

21                  MR. ELLIOTT: Is it an average  
22                  rate that they're on, or are they on a dynamic

1 rate?

2 MR. PERRY: I think they have a  
3 dynamic rate there, but I'm not sure --

4 CHAIR HARRIS: Can we all agree  
5 that for all of this -- maybe I'm just making  
6 this up, but do we all agree you need a  
7 dynamic rate for all of this to work? And do  
8 people generally think this is a good thing?

9 MR. PERRY: I would disagree, just  
10 to finish my thought.

11 CHAIR HARRIS: Sure.

12 MR. PERRY: This is happening in  
13 areas where there isn't dynamic rate pricing.  
14 And the notion of reading the meter is -- you  
15 know, the privacy and security issues aren't  
16 there if it's a one-way read-only interface.

17 And there are devices out there  
18 that you can clamp onto your meter that look  
19 through the glass and look at the meter.  
20 That's a little expensive, and the utilities  
21 tend to, I have heard, rip them off when they  
22 find them attached to the meters, because they

1 can't read the dials as well.

2 But also, this is very little  
3 known, that every meter -- AMR meter out there  
4 that I am aware of, almost 100 million of  
5 them, have an infrared LED that flashes every  
6 watt hour. It is used for calibration at  
7 manufacturing. And that is a little LED, that  
8 if you used a thing like an IR blaster, if  
9 you've heard of that, to retransmit that flash  
10 back to some system, you could cover the vast  
11 majority of meters out there with a real-time  
12 signal received by your PC or some sort of  
13 gateway, with a very simple battery-operated  
14 device just kind of stuck on the glass.

15 So there is ways to do read only,  
16 highly secure, ways to read the meter in real  
17 time, and we will avoid these \$80-, \$100  
18 million of investment, any investment by the  
19 utility. Just need to get access to the  
20 meter.

21 And there are also AMR meters that  
22 have radios that transmit periodically. And

1 if the receiver had the credentials to listen  
2 to that, the same one that is used by the  
3 meter readers when they drive through the  
4 neighborhood, then these systems would be able  
5 to get real-time access to the meter, too. So  
6 you don't have to backhaul all this real-time  
7 data over the networks is the point.

8 MR. INGRAHAM: Just back to your  
9 question about five-minute, 15-minute, five-  
10 second reads, you know, before I came to EPB  
11 I managed the power trading floor at the  
12 Tennessee Valley Authority. So we were  
13 trading in natural gas and electricity 24/7.

14 Everybody we bought and sold from  
15 we obviously had a contractual relationship  
16 with. If I bought power for the next hour or  
17 the next -- the balance of the day or the next  
18 day and it wasn't delivered, there is usually  
19 a liquidated damage provision in there. Okay?

20 We see today at the retail level  
21 trying to create this retail market based on,  
22 in our case, 170,000 meters out there. To

1 start, we think it's a day-ahead market.  
2 Okay? So we send a signal to the consumer,  
3 and we say, "Tomorrow is going to be a really  
4 hot day, a really cold day, we would like the  
5 ability -- you know, so we have a contract  
6 with you, and that says we can move your  
7 thermostat up or down three or four degrees,  
8 for one hour, two hours, three hours, four  
9 hours," whatever it might be.

10 We believe -- and we are  
11 developing the software today, working with  
12 OATI, who manages all of the bulk power  
13 systems -- I'm sure Southern uses OATI's Web  
14 Trans system. We are working very closely  
15 with them. We are working with IBM, we are  
16 working with Bell Labs, partnerships run all  
17 through this proposition.

18 There is no getting around it. No  
19 one is smart enough to do it on their own.  
20 But we are working very hard to get ourselves  
21 into a position where we can aggregate our own  
22 load. We can do voltage control on our

1 system. So, you know, we think we can to  
2 start about 60 megawatts of voltage control.  
3 Our system peaks at 1,300 megawatts in the  
4 summer, about 1,270 in the winter.

5 So we think that we can aggregate  
6 to start about 100 megawatts once we get about  
7 20 percent of our meters on some kind of time  
8 of use scheme.

9 So the challenge to us is going to  
10 be, if the Tennessee Valley Authority says  
11 tomorrow, "I want that 100 megawatts," then  
12 between the time that we make that arrangement  
13 and we physically have to deliver it, they  
14 have to be able to measure it on their side  
15 through the Web Trans -- through the Web  
16 Distribute software.

17 Market conditions are going to  
18 change. We are going to have to communicate  
19 with our customers, and we are going to have  
20 to aggregate their responses. If they don't  
21 respond to us, we are going to assume that it  
22 is okay with them that we go ahead and take

1 control and do some things.

2 In some of the testing we have  
3 done, that has worked real well. But it is  
4 that lagged start where we are going to have  
5 to make arrangements. A storm may roll in,  
6 and we actually may lose some customers, or  
7 system conditions could cause us to lose  
8 customers.

9 That's where we think we need the  
10 15-minute to start symmetrical communication  
11 off the meters, to know what exactly can we  
12 aggregate right up to the time where we  
13 physically have to deliver it, because it will  
14 be a 24-hour/day-ahead product.

15 Now, how long will that last? I  
16 don't think very long. I think that once we  
17 get good at that we are going to -- we are  
18 going to move very quickly into the -- you  
19 know, the potential for even the hourly  
20 markets. There is not anything in the bulk  
21 markets today less than an hour, that I'm  
22 aware of.

1                   CHAIR HARRIS:  Mike, I saw you  
2                   raising your hand.

3                   MR. OLDACK:  I just wanted to  
4                   respond to a comment that was made before  
5                   about sort of separating supply and demand at  
6                   the meter.  Let me tell you, if you do that,  
7                   you may save customers -- save them tens of  
8                   millions of dollars, but you are also going to  
9                   lose them billions of dollars.  Billions.  
10                  Because the value of the smart grid is dynamic  
11                  pricing, which really -- which is getting your  
12                  large appliances offline, your air  
13                  conditioner, your electric vehicle, your  
14                  electric hot water heater, hot tubs, whatever.

15                  And the value to the consumers is  
16                  the ability of the utility to avoid new  
17                  generation, new transmission upgrades,  
18                  substation, all those kinds of things.  
19                  Baltimore Gas Electric, half a billion dollar  
20                  investment, two and a half billion in value to  
21                  consumers from the dynamic pricing.

22                  But what you also avoid is what,

1 Scott, you had mentioned, rich neighborhoods,  
2 cul-de-sac. Three people get in electric  
3 vehicles with 40- or 80-amp chargers. They  
4 all come home at night off peak. They all  
5 plug them in.

6 (Laughter.)

7 Okay. I don't know if you blow up  
8 the transformer, okay, but the value of the  
9 utility being able to look at the whole  
10 system, and optimize the system for the  
11 benefit of everyone, not just an individual  
12 customer with their own home area network, but  
13 the whole grid, that is where the money is.  
14 And I think that is where you have to follow  
15 the value of the money.

16 And once you get your air  
17 conditioner, your hot water heater, all of  
18 these things on it, responding to critical  
19 peak pricing, everything else that you have  
20 left, plugging in your hair dryer, plugging in  
21 this, it is noise. Okay?

22 So I would love to have -- I think

1 we all agree -- anyone who wants to do energy  
2 efficiency, do it now. And anyone who wants  
3 to go in and help customers respond to  
4 critical peak pricing signals, yes, I think  
5 every utility wants that. We want customers  
6 to be involved, and I think giving them the  
7 information is great. But let's not lose  
8 sight of follow the money and where the real  
9 value to consumers lies.

10 CHAIR HARRIS: Mike, thank you.

11 Yes.

12 MR. JONES: I agree completely  
13 with that. And something you asked a bit  
14 before, though, is: are we really talking  
15 about decades? And I did not mean to imply  
16 that 2030 was our horizon. I would say,  
17 though, when -- somehow sometime the customers  
18 are going to be inspired. And when they are,  
19 people adopt technology a lot faster than  
20 corporations do. And I think we might be  
21 surprised by some of that and how quickly it  
22 comes.

1           The challenge is exactly what you  
2           said, though. I think we are interested in  
3           the whole, not all of the parts. It gets much  
4           more complex, though, when every moving --  
5           every little part is trying to fine tune  
6           itself.

7           MR. PERRY: And I just wanted to  
8           kind of reinforce that, that the -- there are  
9           some studies -- market research has shown that  
10          these kinds of systems are going to outpace  
11          the deployment of smart grid and smart meters  
12          10 to one.

13          So you ask yourself the question,  
14          three, five years down the road, when you have  
15          50 million homes that have energy management  
16          systems, and only five million have smart  
17          meters, or whatever the number is, how do  
18          those homes connect to the grid?

19          So one of the fundamental  
20          questions that I think we need to ask  
21          ourselves is: do we want to have 100 percent  
22          coverage in every utility footprint? Or would

1       it be better to have 10 or 20 percent coverage  
2       across all of the utilities? In other words,  
3       20 percent of the utilities with 100 percent  
4       coverage, or 100 percent of the utilities with  
5       20 percent coverage?

6               And what I mean by that is if you  
7       had an offer where somebody could go into Best  
8       Buy and buy a refrigerator that plugged into  
9       the grid in New York, they could -- and George  
10      Arnold uses this as his argument, that I need  
11      to be able to take that refrigerator and plug  
12      it into the grid in California, and it still  
13      talks to the grid.

14              And so that is really important,  
15      that we have interoperability standards,  
16      consumer-to-grid interoperability standards  
17      that allow access to real-time usage and  
18      pricing, so that the energy management  
19      systems, the rollout of those is decoupled  
20      from the rollout of smart grid systems, and  
21      they can be allowed to evolve independently.

22              And I think that the opt-in/opt-

1 out model is very important to the site also.  
2 I think consumers absolutely want to have the  
3 opt-in model. It has been shown time and time  
4 again that they will opt out every time you --  
5 you know, they turn off the -- when there's a  
6 signal to turn off the air conditioner, and  
7 the consumer doesn't want to turn off the air  
8 conditioner, they -- you know, they don't like  
9 the idea of having the utility having the  
10 control over that, because it is a hot day and  
11 grandma is over.

12 So one of the key issues there is  
13 that, to have a consumer-to-grid interface, it  
14 is not done at the physical layer. It needs  
15 to be done at the applications layer. And so  
16 the issues of whether to use ZigBee or not, or  
17 this interface or not, or that, are really  
18 kind of irrelevant.

19 In the same way that Mosaic  
20 allowed -- created interoperability for the  
21 internet, I think the Federal Government could  
22 set a couple of standards, minimum standards,

1 to provide interoperability for the consumer  
2 to the grid. And that way anybody in the  
3 country could opt-in next week, and the  
4 utility wouldn't have to be in that critical  
5 path.

6 CHAIR HARRIS: Yes, a question in  
7 the back.

8 MR. YOUNG: Yes. My name is  
9 Virgil Young, D.C. Public Service Commission.

10 CHAIR HARRIS: Can you speak up.  
11 I'm sorry. The acoustics are not that great  
12 in here.

13 MR. YOUNG: Yes. My name is  
14 Virgil Young. I'm with the D.C. Public  
15 Service Commission. I think one thing that  
16 has not been talked about is mobile broadband  
17 and how that will impact the smart grid and  
18 telecommunications.

19 Mobile broadband, the T-Mobiles,  
20 the Verizon Wireleses of the world, when  
21 mobile broadband kicks in, that will create a  
22 tremendous e-commerce platform, and that will

1 help with the value proposition for the  
2 consumer. He or she will be able to not only  
3 control the energy in their home, but also  
4 other quality of life issues like elderly  
5 parents. You can say, "Hey, boy, the  
6 temperature in the VA Hospital where my  
7 elderly father is located is kind of low.  
8 Hey, I'd like to turn it up. I'd like to be  
9 able to turn it up." And so I think that is  
10 going to be key.

11 Another key thing is, when you  
12 talk about net neutrality in the  
13 communications world, there are going to be  
14 net neutrality underpinnings in the utility  
15 world. You know, a lady spoke of, you know,  
16 if you want to have real-time data going, you  
17 are going to have to have big broadband pipes.  
18 Not only that, the utilities and the wireless  
19 carriers are going to have to prioritize  
20 certain packets of data to get faster.

21 So net neutrality is also going to  
22 be impacting the electrical grid as well. So

1 mobile broadband and the effects of net  
2 neutrality I think are two dynamic forces that  
3 are also having an impact on the value  
4 proposition of the consumer.

5 CHAIR HARRIS: Gee, and I thought  
6 by coming to DOE I had avoided net neutrality.

7 (Laughter.)

8 PARTICIPANT: And I thought by  
9 coming here today I didn't have to --

10 (Laughter.)

11 CHAIR HARRIS: We are about out of  
12 time. One more question in the back.

13 MR. CAMPER: Well, just part --  
14 partly a comment. Ward Camper, Glennis &  
15 Gere. I think there is kind of a perception  
16 when you said, "All these home energy  
17 managements, only five billion meters," I  
18 think people fail to understand that 40  
19 million meters are already under contract, or  
20 will be, by the end of 2010.

21 Lynne's company is exactly what is  
22 going on -- three- to seven-year at times

1 process of putting in smart grid, AMI, and now  
2 the contracts are coming into fruition. In  
3 another two years, another 40 million will be  
4 under contract.

5 So 80 million out of the 150  
6 million meters are going to be under contract  
7 within a couple of years, and I think that a  
8 lot of folks, especially even at DOE, they  
9 see, well, there is only one or two million or  
10 three million or four million actually  
11 deployed. Gee, smart grid is not going very  
12 fast. It is a smarter grid, to Lynne's point,  
13 and not a smart grid, because we are just --  
14 it is an evolutionary process.

15 But much of this is already done,  
16 and I think that people fail to understand  
17 what has already happened. And to Lynne's  
18 point, don't load up a bunch of stuff when the  
19 processes that take three to seven years are  
20 now coming to fruition, don't change too much  
21 the rules or change the whole architecture, it  
22 can load a lot of cost on consumers.

1 CHAIR HARRIS: Thank you.

2 Okay. So we are officially out of  
3 time. I want to give everyone around the  
4 table, though, at least an opportunity, if  
5 they would like to make a quick final  
6 statement or if they got cut off or if there  
7 is something they'd like to say just to wrap  
8 up.

9 Jim, anything, or --

10 MR. INGRAHAM: Well, you know, I  
11 think we have a long way to go still to be  
12 able to prove what the formula for smart grid  
13 is. I agree with a lot of what we've said  
14 today. Some of it I don't agree with. I  
15 think that we need experience to learn the  
16 answers to these questions, and, you know, I  
17 think it is going to take time.

18 I do think that it is right that  
19 consumers can very quickly get out ahead of  
20 the industry on this subject, if the industry  
21 -- if the electric industry doesn't pay very  
22 close attention to it and try to figure these

1 things out. Unfortunately, I don't know that  
2 that's going on everywhere in the industry.  
3 And an education program like -- discussions  
4 like this one are very helpful for that.

5 CHAIR HARRIS: Thank you, Jim.

6 Roy?

7 MR. PERRY: Well, to the comment  
8 that 80 million smart meters are coming, and  
9 there is four million today and growing, I  
10 heard a number -- that of those four million,  
11 only about 4,000 have the home area network  
12 interface enabled. So if you could --

13 PARTICIPANT: Pretty close.

14 MR. PERRY: Okay. That it was a  
15 small -- less than one percent, okay? So I  
16 guess that data was wrong. I got that from a  
17 market research company.

18 But the point is that it is not  
19 all of them, and unless you have that home  
20 area network interface enabled, then the home  
21 area network is not going to get access to  
22 pricing or usage data, if that's the only

1 path.

2 CHAIR HARRIS: Thank you, Roy.

3 Lynne?

4 MS. ELLYN: I would just like to  
5 point out that large, complex systems, whether  
6 they are social or they are physical, are  
7 subject to emergent behavior none of us have  
8 understood. And we hear these comments about,  
9 "The consumers are going to get ahead of us."

10 We were in Japan last month at the  
11 big international conference. Sweden and  
12 Italy are totally, completely, smart grid,  
13 everybody. And after six months of real-time  
14 pricing, the head of the Swedish effort said,  
15 "The bottom line is people like their  
16 television on and their beer cold."

17 (Laughter.)

18 And the usage data -- and the  
19 usage data went back to what it was  
20 beforehand.

21 Also, we have been on a path for  
22 50 years of greater and greater energy

1 efficiency, and we continue on this path. But  
2 as much as we continue on this path, we find  
3 new ways of using it. So this is a  
4 complicated thing, and if we have to err on  
5 one side or another, let's maintain a safe and  
6 stable grid.

7 CHAIR HARRIS: I'm pretty sure we  
8 can all agree on the cold beer. Kyle?

9 MR. McSLARROW: In the interest of  
10 time, I'll pass, but thanks for --

11 CHAIR HARRIS: Okay. Thank you.

12 MR. YOUNG: I'd just say there is  
13 a lot of change underfoot. I don't think  
14 utilities in a vacuum can do this on their  
15 own. I don't think we are planning to do it  
16 on our own. We are going to need a lot of  
17 partners, particularly when it comes to things  
18 on the other side of the meter that are  
19 further away from where our core expertise is.

20 I do think utilities are very  
21 concerned about reliability, as is the Federal  
22 Government. The thing about electricity --

1       you can't have public safety, and I think it  
2       is critical to the economic stability of the  
3       country that you really don't want to drop the  
4       ball on that, but at the same time embrace the  
5       exciting things are coming and figure out how  
6       you can do them in a secure and reliable  
7       manner.

8                   CHAIR HARRIS:   Michael?

9                   MR. LANMAN:   I would just say that  
10       I think everybody agrees it is a journey, and  
11       this was an interesting, you know, move today,  
12       to get together.  And I realize I have learned  
13       a lot today.  But I would say that, you know,  
14       the deep partnerships we have already got with  
15       many of the utilities, we are learning more  
16       every day.  And I think the journey is going  
17       to speed up as we go along.

18                   But, clearly, there is a lot of  
19       opportunity, and I think the people at this  
20       table represent a subset of the people that  
21       are worrying about this around the country.  
22       And I think we are making a lot of progress,

1 so thanks for being part of the journey.

2 MR. JONES: Thank you, Michael.

3 Jim?

4 MR. JONES: Thank you. And I  
5 think a lot of the journey that we are on is  
6 about how to make the energy system perform  
7 better. I think information is the core of  
8 that. That's what makes it smarter.

9 I think, though, information in  
10 particular will drive innovation, and I think  
11 we are all -- those are really the changes  
12 that all of us agree we are trying to  
13 accomplish.

14 CHAIR HARRIS: Sherman, just like  
15 in the real world, you get the last word.

16 (Laughter.)

17 MR. ELLIOTT: Well, just an umber  
18 of things to digest from today. But I think  
19 one of the key issues from a regulatory  
20 perspective is we all know that what we have  
21 been talking about have very considerable  
22 positive costs on consumers, the benefits of

1       which we have all been talking about are  
2       somewhat etherial at this point.

3                       But the problem is, from a  
4       regulatory perspective, the costs are up  
5       front, and the benefits stream.  So how do we  
6       net the cost-benefit relationship in the  
7       regulatory sense, and say, "This is a plus or  
8       minus from a consumer perspective"?

9                       From my point, the DOE grants on  
10      ARA, stimulus money helped a great deal.  It  
11      does give investment support for these  
12      projects and lowers the cost-benefit  
13      relationship, the hurdle that we have to  
14      engage in.  So kudos to that, and I hope it  
15      continues and that we can possibly win a grant  
16      one of these days.

17                      (Laughter.)

18                      CHAIR HARRIS:  I'm sure that does  
19      cross some line we shouldn't have crossed,  
20      but --

21                      (Laughter.)

22                      MR. ELLIOTT:  The second point,

1       you know, regarding all of this is I think,  
2       you know, we talk about killer apps, and we  
3       have talked about the electric vehicles -- I  
4       mean, I don't know where these things are  
5       going to show up in the system. I don't know  
6       whose driveway. Normally, when you buy a  
7       vehicle it doesn't come with an electric rate.

8               I think we all recognize that if  
9       these things do take off in any way, shape, or  
10      form, that it can have significant impacts on  
11      the current system.

12             The opposing side of it is that we  
13      have sufficient excess capacity off peak to  
14      fuel 85 percent of the light duty vehicle  
15      fleet. How do we do that? In my mind, the  
16      only way we do that is pricing. I can see no  
17      other way to make that vehicle. I suppose  
18      command and control, but it seems to me that  
19      pricing is going to -- is going to be what it  
20      takes.

21             And so I think that, you know,  
22      whether we get there a day ahead, whether we

1 get their time of use, whether it is critical  
2 peak or real-time pricing, I think we have to  
3 engage in that strategy going forward.

4 CHAIR HARRIS: Sherman, thank you.

5 I would like to thank all of the  
6 panelists who took their time to come to  
7 Washington today or to come across town and  
8 skip the net neutrality stuff.

9 (Laughter.)

10 And I would like you all, if you  
11 wouldn't mind, to give them a round of  
12 applause.

13 (Applause.)

14 And thank you all for taking your  
15 time to come by. I very much appreciate it.  
16 Thank you.

17 (Whereupon, at 12:08 p.m., the  
18 proceedings in the foregoing  
19 matter were concluded.)  
20  
21  
22