Chairman Jon Wellinghoff in Conversation with Joel Makower

Wellinghoff: FERC is responsible for the wholesale electric grid. We are responsible for not only the grid operation and its physical operation from a standpoint of how efficiently it operates, and we set the rules for that, reliability standards for the grid.

We also are responsible for markets and developing markets within the wholesale grid system. So we establish the rules for those markets and try to make those markets work in as an efficient way as possible to ensure that we can have as many participants both on the supply side and increasingly now on the demand side where I think all of you come in, and something that hopefully we can talk about in more detail about how that convergence is really happening between what used to be building resources, load resources that really did not participate in the grid and now under what FERC is doing, what we are doing with our market rules and the way that we are now attempting to restructure those markets allow that convergence to happen.

Makower: And your mandate goes beyond even electric. You've got natural gas pipelines, and I think even oil pipelines.

Wellinghoff: Yes. We also are over the natural gas markets, the wholesale markets for natural gas. We are over the hydroelectric systems and their construction and permitting, and permitting of LNG facilities in the country as well.

But really the bulk of what we do really focuses on electric bulk power system, bulk transmission system, electric markets, electric wholesale markets throughout the country, the operation of those markets the

interconnection to that electric system as well and the rules and regulations for that. And also paying for it, how it is all paid for. We set up the cost allocation mechanisms to pay for these structures and these markets as well.

M: And, again, just to clarify – we are going to have two of the leading utilities, Pacific Gas and Electric and Exelon here – you do not regulate them directly. Those are regulated at the state level by the public utility commissions. You are looking at interstate transmission…

W: We actually do regulate them directly to the extent that they are market participants, which they are, they have affiliate entities that participate in these markets, generators that sell in these markets. So anything they do relative to those markets and anything that they may construct as far as infrastructure regarding part of those markets, which would be high-voltage transmission systems and bulk power systems, we will and do regulate them directly as well.

M: So the part that we know of as consumers where we get a bill from them, that is under the state, but where they are buying power and sending it across state lines or generating power that's under your…

W: That is under the local retail distribution level. So, at retail distribution, where they are making sales to an end-use customer at retail, that is under the state public utilities commission or the state authorities.

M: I don't want to go too far down that rabbit hole because it gets really…

W: We share authority with the states; we have the wholesale authority, they have the retail authority.

M: So the way that we first connected with you was that last year after we did our three VERGE Roundtables in Shanghai, London and San Francisco, you, the head of this federal regulatory commission was caught on YouTube talking about VERGE and us. We thought that was interesting, and we entered into a conversation. You happened to be coming through our neck of the woods and we had you for lunch – we didn't have you *for* lunch, but we invited you to lunch (laughter) – at our office in Oakland and had this really great conversation.

At one point, it was so enthusiastic and exciting, and I asked you, I said: I'm still not sure Jon why the head of this federal regulatory commission is that interested in what this small media and events company in Oakland, California is doing. And you clarified it in a sentence or two, and you said: It's very simple, the utilities are dinosaurs, they either don't get it or don't acknowledge it. Your audience, GreenBiz's audience, are their biggest customers.

So that is why we are here, to talk about that dynamic of, first of all, why are utilities dinosaurs and then we will get to how the customers can play a role.

W: Well I think the traditional utility is either going to have to change or die. Because ultimately the old model, which was the traditional vertically integrated utility that sold at retail, had a transmission system

and had their own generation, and then provided from that generation to meet their local loads is one that is completely turned on its head now with this convergence of technologies, with the communications, with the building systems that are now available. And with the ability to allow those systems to participate in the grid, we now have the ability to have everyone be, in essence, their own mini-utility. So those entities now are going to be largely relegated to sort of the distribution wire systems and they are going to have to look at other business models to spin off to assist their customers in participating in these grid opportunities.

Because those grid opportunities are huge. We have literally tens if not hundreds of billions of dollars in potential savings that can be achieved by having building entities participate in the grid in real time and respond to market prices out there in real time. Wholesale market prices are changing every five minutes in many areas of the country.

M: Literally every five minutes.

W: Literally every five minutes. I've got a great presentation I do on a day in the life of the grid that shows hour by hour how these prices are changing in the Midwest, over 13 midwestern states, going from $0 to over $150-200 a megawatt-hour in that one day in 1,900 locations in that grid area. If customers could access those prices and respond to those prices, either increasing loads or lowering loads appropriately, they could save tremendous amounts of money. They could make the system much more efficient. It is going to change the way that we look at the how to operate the system.

So the traditional utility will no longer be one that is sort of husbanding for its customers its needs through going out and getting new generation to make sure that it can meet that load. It will now be managing the system where the loads will be interacting on a dynamic basis with the supply, and all will be working together to try to make the whole system more efficient in a convergence of these things together.

M: But isn't this already happening. If you were to go, as I have recently, onto the web sites of most of the major utilities, whether they are so-called IOUs – the investor-owned utilities – or the big municipally owned utilities like SMUD in Sacramento or LA City or others, they all talk about smart grid. They all talk about AMI advanced metering, they all talk about this new world of two-way communication. So, aren't they already on this path?

W: Well it's the first baby step. The first step is enabling the consumer to have their own data to understand their own usage, and then from that usage have the ability then to respond to external prices. So we are starting that first step of just giving that consumer that information, and that is very important. In fact, I've got in real time now on my iPad where I can see in my home all the things that are going on. I called my wife up yesterday afternoon and said, how's the laundry going, because I could tell that she was doing the laundry just by looking on my iPad, seeing the usages and the different sub-usages.

That kind of data, ultimately, if it can be given to consumers and then consumers can have it to utilize, it's very powerful. But the next step is then we have to be able to give them the ability to respond to that data

in ways that will make them, help them lower their overall bills, and we can do that by having them be able to respond to real-time prices out in the market. We have congestion all over this market. We have plants that are running that are higher cost, lower cost, etc. in all different places in these markets. So, ultimately, if customers could see that and know that and take advantage of it then they can respond accordingly with their own loads and resources on their side, and save themselves tremendous amounts of money in their overall energy use bill.

M: I think the real power of that app, by the way, is when she's going to call you and say, How's the laundry going? (laughter)

W: Right, exactly.

M: What does it take to make that happen? One of the challenges – and this is true in the entire VERGE space, such as it is – because of this convergence, is that there are so many different players, so many different parts of the value chain of any of these markets, but we are talking now about electricity. There is the customers, there is the retail aspect of the utility, there's lots of third-parties now who are involved either as an adjunct to the utility, providing some of the real-time, green button-type access. And there is this whole incredible – that I'll never in my lifetime understand – of independent system operators, grid operators and lots of others. And we haven't even yet talked about the electric vehicle companies and both them and others as potential storage vehicles.

What is the conversation that needs to take place that is going to move this forward?

W: Well, it is not a neat and clear conversation because we do have different levels of sophistication and levels of movement toward this sort of strategic vision in different parts of the country. Some places are much more advanced, like the Mid-Atlantic area and New England, New York and the Midwest than say the Southeast and large parts of the West. So the conversations are going to be different in those different places.

But largely the conversation has to go like this: Ultimately, I believe that the end-use consumers, the large consumers, the people you have represented in this room, and the smaller commercial and residential consumers have to go to their state commissions and their Legislatures and say, look we want to have the ability to use this data in ways that can help us control our costs. To be able to do that, we have to have retail access, we have to have access to market prices and we have to have the ability to respond to that. If you allow us to do that, ultimately we know that we can better control our costs because we now have the data and the ability to do that.

In some places they can do it. In PJM, for example, which is the Mid-Atlantic regional transmission organization, you have now over 10,000 megawatts of demand response, that is consumers bidding demand into the system because they have access ultimately to the information of when that demand is necessary and when it can in fact be beneficial for them because they can get payments for doing that. They don't yet have access to real-time prices, but they do have the ability to ultimately get paid by the grid operator to change their demand at appropriate times.

M: In other words, say you can turn off this HVAC system or you can turn off this refrigerator for five minutes an hour or dim it down at some level when demand gets high. That's what you mean by demand response?

W: Exactly, although they do it much broader. They can do things like also use it for regulation service, which can be used 24/7 as opposed to just peak times that a lot of people think about demand reductions. So it is something that is going to spread all through the year, and it is something that is going to spread not only on the demand side but also on the side of providing grid services like spinning reserve, regulation and other grid services that can be provided by the way that loads operate.

There are things now that were traditionally provided by generators that be provided in fact better by loads because they can be done faster with digital communication. They can be done in ways that ultimately can reduce costs for the grid but also reduce costs for the customer who is actually getting paid to do that rather than a generator.

M: So there are two things that I've seen you've said. One is you've called demand response, which is what you are talking about, the killer app for the smart grid. And another thing that you have said, I think a number of times, is that if you unleash the information, you unleash the power – and I assume you mean by power the electric power. So to a certain extent the silver bullet, to the extent that there is one – and I know that it's much more complex, it's more the buckshot mode – is that people get information, that customers and companies in

particular get information, more and better and real-time information about their energy usage that allows them to make decisions that they can then act on or not, but at least have the opportunity.

W: This allows the grid operators to make the system work more efficiently, because what we have right now is a system that ignores what is happening on the load side except for load going up and down to try to match it with generators. If we instead have the load looking at what is happening on the other side, those generators can start operating more efficiently. Because when you start running the generator up and down, you've got a combustion gas turbine or even a coal plant that may have to run up and down to match load, it is running extremely inefficiently versus if it is running at its optimum heat output you are going to save emissions, save costs and ultimately save cost for everybody on the overall system.

But the way to do that is to allow loads to respond to prices so they can know, if they can participate, save costs for themselves and save efficiency on the system overall.

M: And this is completely different from how we traditionally have run . . .

W: Yes. It was blind.

M: . . . because you had utilities and they would need more power so let's fire up the plant and dial it down when we didn't. Up, down depending on time of day, time of year.

W: Extremely inefficient operation. We don't have to do that anymore. We have the capability now with the communications and the load knowledge that we have to make the whole system work much, much more efficiently. And that will save costs, billions of dollars for everybody.

M: So you've got some of their biggest customers, as you said, in the room here and many, many more are streaming on line or will see this after the fact on GreenBiz, and what do you want to tell. What is the opportunity that you see that they are missing that will allow them to reach some of their sustainability and cost-cutting goals, while supporting this more efficient grid.

W: Well, I'd tell them two things. One, to the extent that they're businesses and enterprises are in regional transmission organization areas where they can participate in the grid in demand response, in energy and capacity and ancillary services, they should investigate that and try to do that, and see how they can take advantage of that.

To the extent they are not in an area that allows that now, they need to go to their state regulators and their state Legislatures and make sure that that changes, that they ultimately are given that choice. They should have the choice to be able to participate in those wholesale grid activities that now people in PJM can do, in New York can do, and in New England can do. They are starting to more in the Midwest and will be doing in California, and in Texas as well. Those are the main area where these independent grid operators exist.

There are none now in the West, except in California; there are now none in the Southeast. But in these other areas, these independent grid

operators allow retail customers to participate in wholesale markets to the extent that their state commissions allow them. Now there are some state commissions in the Midwest that are still restricting customers from participating in those wholesale markets and, again, I would encourage you as a customer, as an end-user to go to your state commission and say, wait a minute, I want the choice. I've got the data now, I've got the ability to start controlling my costs, let me have the choice to participate in these kinds of operations.

M: So to be just a little more specific and a little more technical, what should they be asking for?

W: Well they are asking for retail access if they don't have retail access.

M: Explain what that means.

W: That means their ability to go out and ultimately choose their own provider for energy, and also choose their own provider to help them do these grid services as well, because they both need to buy energy, certainly all these customers need to buy energy, but also they can in essence sell – you had Amory Lovins here yesterday – negawatts. They can in essence sell negawatts and negawatt-hours. They can sell capacity, they can sell energy – effectively by modifying their loads – back to the grid as well. They need to have that ability to do that, and not every state allows consumers to do that.