

**HARVARD ELECTRICITY POLICY GROUP
NINETY-FIRST PLENARY SESSION**

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Rapporteur's Summary***Session One.****State of Retail Competition: Looking Back/Looking Forward**

While wholesale markets have grown increasingly competitive over the last three decades, has retail competition kept pace? Half of the states in the US have not undertaken any serious effort to open their markets. Among those that have, some seem to have had more success than others. Some in the sector have suggested that the effort to open retail markets be abandoned. What has enabled retail competition to be viable in some locations while less so in others? By what criteria do we ascertain whether a market is viably competitive? What barriers may be operating that inhibit competition in retail supply? A number of factors have been cited. Is it the structure of default or provider of last resort service? Should such service be provided at all? Is the default rate set too low, or is it being subsidized to the disadvantage of new entrants? To what extent is the viability of competition in supply inhibited by the identity of the default provider? Does it matter if that provider is the incumbent utility or not? Is there a problem with access to consumer data? What about who controls the meter and who carries out the billing? To what extent, if at all, do poor price signals in retail markets inhibit the growth of competition?

Speaker 1.

Ladies and gentlemen, it's a great pleasure to be here. I've tried to take the title literally, so I start by looking back, then looking around the world, and then very briefly looking forward.

Now, we're here at the 25th anniversary of this group, which I think is a tremendous achievement, but I want to start by taking you back 35 years, because 35 years ago the British

government had just decided to privatize British Telecom. These were the days of Margaret Thatcher, and I thought, if they can privatize British Telecom they can privatize anything. And I thought the biggest prize was to privatize and introduce competition in the electricity industry.

Now, Paul Joskow and others had, at that time, in 1983, been talking about restructuring and introducing competition in the US electricity industry, and others were talking about that in the

* HEPG sessions are off the record. The Rapporteur's Summary captures the ideas of the session without identifying the discussants. Participant comments have been edited for clarity and readability.

UK, but it seemed to me that the big challenge was going to be, if you got a competitive wholesale market, how do you translate those benefits to retail customers? What is the mechanism that gets those benefits to customers?

Now, you might say, “Well, regulation is the obvious way to do it,” but from our perspective at that time, regulation wasn’t the solution, regulation was the problem, because we thought that, first, regulators couldn’t be trusted to work out the best way to convey these benefits, and, second, regulators have all sorts of political and other pressures on them, which means that they wouldn’t necessarily protect customers.

So, the question in my mind was, how can we introduce competition at the retail level? And it seemed at first impossible, because there was basically a monopoly of the distribution network wires to any customer. But looking at what was going on in telecoms at that time, it occurred to me that if you could provide some sort of use-of-system obligation on the distribution and transmission company, so that they had an obligation to let any generator, any wholesaler, any retailer, use their networks at a regulated price, then any customer could get supply from any generator, any retailer, in the country. At a stroke you would introduce competition into that important sector of the industry.

So, I was very excited about this, and sometime at the end of 1983 or in early 1984 or ’85, I came to Boston, and I met in a bar with Bill Hogan and Paul Joskow. And I explained my exciting new wheeze to them, and they said, “Nah.” They said, “The big boys already get a discount from the government, and the little boys don’t consume enough to make it worth their while, so no one’s going to be interested.” So, armed with this support from the two leading electricity economists in the world, I went back to the British government and said, “Well, I think it’s a

good idea.” And I became advisor to Cecil Parkinson, the Minister, and so I suggested to him that we do this. And he thought, or was persuaded, that it was a good idea, so we did it.

So in 1989 the British government started to privatize and introduce competition in electricity. I negotiated a rollout, over eight years, from the largest down to the smallest customers, and that was implemented in 1998, and that was basically the last thing I did as regulator. (Not because I did it, but it happened to be the last thing I did while I was there.) And then, basically, almost all of the rest of the world, at least the developed world, has followed suit.

So it’s been a great pleasure for me to look over what’s gone on and what is going on at the moment and make some comments about the future.

So, let’s start with the question, what has the experience been? I think there is almost general acceptance that for large industrial customers, retail competition has been a success and has worked well. I think there is almost as much support for the notion that it has been a success for smaller customers, business customers, with some reservations, perhaps. My observation is that, from the UK, when we opened those markets, the biggest price reductions of all came for the small commercial customers. They were the ones with the least political clout beforehand, and they paid the highest margin on their costs. So I would guess that retail competition has done well for the small business customers as well.

On residential customers, the outcome’s not clear, and I think that’s reflected in the questions posed for this session, and will come out in the discussion with the various speakers.

Moving on, then, to what happened in the UK, basically, we restructured. We opened the market

over time, and I was worried, when I opened the market, whether anybody would be interested, thinking of the Hogan-Joskow comment. And I thought that if only 5% of customers changed their supplier, that would be difficult to defend. But if 10% did, I was OK. And basically 10% a year changed their supplier, and so that wasn't a problem.

The second problem would have been if customers were faced by price increases when the market opened, instead of decreases. And for that reason I put a price cap on for a couple of years. It wasn't intended to pass through costs precisely. It was intended to make sure that prices didn't increase, which would be difficult to defend. And I left the offering of price reductions to the competitive market. And I wanted to make sure customers understood that.

Well, competition did develop, and the price caps were soon removed, so everything seemed to go well, at least until 2008.

Let's move now to California, which opened its market shortly afterwards, in more of a rush to get things done, with less time between opening the retail market and opening the generation market. There were restrictions on the utilities to prevent them from signing long-term contracts--from hedging, in effect--perhaps to reduce the extent of generation market power, but the problem was that a price cap was put on which it was difficult to meet when wholesale prices suddenly increased. In San Diego, the price cap had been removed. The increases in prices in the early 2000s were extremely striking and politically embarrassing, and for those utilities that still had a price cap, they got into financial difficulties, and I think one went into bankruptcy. So that was a problem in California.

Let's move on from California to Texas. Speaker 2 will talk about this, so I won't spend much time

on it, but basically, I think, Texas had a more considered and thought through and more patient approach in a state that was more committed to competition anyway, and Speaker 2 will perhaps explain how the initial price caps were later removed and quite radical steps were taken to break up the distribution utilities for retail competition. And Texas has become what has often been described as the most active and advanced competitive market in the nation.

What about the rest of the US? Well, basically, 13 other states have introduced a competitive retail market. They also require the incumbent utility to offer a default price. The way in which that's done varies. It has varied over time, and it varies between the states. Most of them have accepted the way that it's done in New Jersey, which is to put the requirements out to tender. Others have considerable amount of buying at the margin by the utilities. The incumbent utility is required to provide various services for the various competing retailers. So it's a more complex picture than I think we see anywhere else in the world, I would guess.

What about the extent of competition that's resulted from that? Well, if you take the 14 competitive states (including Texas) as a whole, you find that something like 40% of the customers have chosen a competitive supplier, rather than remain with the default supplier. But that kind of exaggerates the picture, in a sense, because Texas is classed, for purposes of those calculations, as 100%, and in another two or three states--Ohio, particularly, and Illinois--there's been a considerable amount of municipal aggregation, which means, in effect, that it's the municipality that is taking the initiative and switching, and not the customers. So if you look at the interquartile range amongst these 14 states, it's between 15% and 45%, and the median is about 20% of customers who have actually taken an active decision to switch and take their

electricity from competitive suppliers. And that contrasts with figures of around 68% in Texas, 70% or more in the UK, and between 74% and 91% in Australia. So you've really got an order of magnitude difference in the extent to which residential retail customers are actively engaged in this market in these ultra-competitive states, if you like, compared with the 13 US states with the default pricing arrangements.

Now, what is the effect and the extent of competition in these 13 states, and how do the prices relate to what the default supplier offers? Well, basically, you've got two points of view, and I think we'll hear them both this morning. One is that the default tariffs offer better value than what is offered by the competitive suppliers and actually by regulators themselves. This has been argued by customer groups. Speaker 4 will talk about this, and actually three regulators themselves have actually made calculations in the last two or three years suggesting that this is the case. On the other hand, the retailers, and I guess Speaker 3 here will be taking this point of view, argue that in many cases the default services are underpriced, that there's an element of cross-subsidy going on, that the calculations don't value the various aspects of the competitive offerings that might be of greater value to customers than the default service price, that it is possible, if you are particularly active, to do better if you use competitive suppliers, and that the dispersion of prices that you see in this market is not a reflection of the market not working. You find that in any competitive market. So you've got two contrasting views, and I'll think I leave it to the other speakers this morning to expound those.

I'll give a brief summary here of what some published academic, in some cases quasi-academic consultancy work, has shown. There have been some studies claiming that there is little evidence that retail choice has been beneficial, and others claiming that there are

significant productivity and price benefits that can be associated with it. But it seems to me that there still are many questions. These pieces of work, and others that I've seen, don't really answer all the questions that one has. Are there benefits for example from retail competition itself, or do the benefits flow from having a default service arrangement that would still apply even if you had no retail competition? What are the differences and benefits associated with the Texas system versus the other 13 states, and are there differences between these 13 states? These kinds of questions have received little or no analysis, it seems to me, and would be well worth PhD students, for example, working further on them.

Currently, what we're seeing is a considerable amount of disillusion with the retail market in some of the states and some of the jurisdictions. For example, in Connecticut in 2015, a ban was put on variable rate products, but it seems to me this was almost entirely associated with a sudden rate increase following the polar vortex situation. And, in fact, the regulator in Connecticut almost indicated as much and invited the legislature to change their mind.

That's not so serious, it seems to me, but in New York there have been much more serious developments. And I guess two of the speakers today will talk more about that, but basically the staff are becoming concerned about some of the actions of some of the retailers. In 2014, the regulatory body decided that retail providers had to guarantee that their prices would offer a saving over that offered by the default service provision. That was for low-income customers. In 2016, they extended that to all customers. The suppliers' retailers challenged this. There's been a long-running battle in the courts and in the regulatory body. I don't know precisely where it stands at the moment, but it's clear that there's a strong mood in part of New York to restrict

competition very considerably, and it raises the question, in New York, for example, as to how this is going to impact the Governor's policy of changing the electricity sector, which is said to depend quite heavily on an active retail sector.

Let's just very quickly look at a couple of developments from around the world in Victoria, Australia. A review commissioned by the state government found that competition wasn't providing sufficient benefits to customers and recommended that all retailers be required to provide what looks very much like a default tariff, as in the 13 US states. And it doesn't see this as a transitional arrangement until competition develops. It sees this as, it would seem, a permanent change in approach.

New Zealand, similarly, is getting very apprehensive, and the new government said, "Well, we're not sure what's going on. Why have retail prices increased for domestic customers very significantly when they haven't for industrial customers? Something must be happening. We don't know what it is. Let's have a look." And the criteria that were laid down were efficient, fair and equitable prices—so not aiming for a competitive market, per se. We've got these concepts of "fair" and "equitable" coming in, which economists, I think, are not very comfortable with.

In the UK, we have had a different approach taken by the regulator since 2008, compared to the approach up to 2008. In 2008, at the beginning of the year, in January, there were price increases, and the regulator assured the Chancellor of the Exchequer that the "market is sound," but a select committee said, "Well, we don't think so. We're going to investigate this." So, Ofgem two or three weeks later said, "Well, we're not sure either. We'll just have a look and make sure that it's sound," and it concluded that there were competitive developments in many respects, but

that there were unfair price differentials between the prices companies charged within their previous incumbent areas and the prices outside. And, basically, they introduced a non-discrimination condition, saying that this mustn't happen, and they claimed that those customers paying the higher prices would henceforth pay lower prices. What in fact happened was precisely the opposite. The customers paying the low prices found that those prices suddenly disappeared. Everybody paid the higher prices. So, in general, competition went down, prices and profits went up.

Basically, after a couple of decades of falling prices, prices doubled within about four or five years, and that's enough to lead to intervention by the regulator. The switching rate (the proportion of customers changing per year) was adversely affected by this development. So, we had something like a 15% rate of customers changing each year in the early days, increasing to about 20% in 2008. That then fell to 10%, and has gradually increased to nearly 20% again. So the market seems to be recovering. What Ofgem said, however, is that it wasn't their fault that the switching rate went down. They said that it was because retailers introduced some new and complicated tariffs, and customers didn't understand that, so they were baffled and decided not to switch suppliers. So, Ofgem said, "We're going to solve this by requiring companies to offer simple tariffs, for example, no discounts allowed, and limit them to four tariffs per supplier, so there'll be fewer tariffs in the market." Well, what this meant was that a lot of beneficial tariffs disappeared; there was much less innovation; and the problem didn't seem to be solved. The situation was referred to the Competition and Markets Authority (CMA), which had a two-year investigation and concluded by saying that Ofgem's policy had been a mistake, and that there were no tangible benefits and clearly very tangible restrictions on

competition, so Ofgem should stop it. But it also said that they saw enormous price differentials in the market that customers were not responding to, so that there must be something wrong here. The customers were exhibiting “weak customer response.” And this gave the suppliers market power which they were using to raise their prices and adopt various kinds of price discrimination. And the remedy for that was to make the customers more active. So, for example, those customers that hadn’t changed a supplier for three years, their names were to be put on a list that was given to Ofgem which would then make these names available to rival suppliers and invite them to send a barrage of emails and other approaches to the customers—I have to say I’m in opposition to that, on various data protection grounds and so on, but Ofgem actually has started trialing this. And what it means is about a 1% or 2% increase in the participation of these lazy customers, which is something, but it hardly transformed the market.

Anyway, the report also said that for prepayment meter customers there are some additional restrictions in technology. They should have a temporary price cap for a couple of years. Now, as to whether that price cap should be extended to all customers, or all the customers still on standard variable tariffs that weren’t changing, the majority of the CMA said that would be awful, and that would restrict competition. It would be to the long-term disadvantage of customers. But one member of the commission, who happened to be a professor of economics, said, “Well, the detriment that we have found, which the CMA put at 1.7 billion pounds a year, is so great, and these remedies are so untried and untested, that we can’t rely on them. We need a price cap.” So there’s a difference of view there. What happened was that this became a political football, especially in the election. Every single political party proposed to intervene in the electricity market. Several of them quoted the 1.7

billion pounds detriment and said, “We need a price cap.”

The government in effect promised the price cap, and it is presently in the process of passing a bill. You see, they invited Ofgem to impose this price cap, and Ofgem said, “No, we think it’d be better if you did it.” And so the government is now in the process of passing a bill that will force Ofgem, the regulator, to impose a price cap on about 70% of the customers in the country. And it has all parties’ support. You can’t find a single person in Parliament to speak against it. So we’re expected to have a price cap on about three-quarters of the customers by the end of the year. Oh, well, that’s what it’s come to.

Now, four or five regulatory colleagues (my successors, for example) and I, we think this analysis by the CMA is misguided in various ways. We don’t think the \$1.7 billion stands up to scrutiny. We don’t think there’s sufficient understanding of why there are different price differentials in the market. And we think there are also distortions, because the lowest prices are being offered by the smallest new entrant companies, which are exempt from a series of social and environmental costs. So we think that is very misleading, but, nonetheless, the competition body has given its name to that particular calculation.

Looking ahead, what is going to happen? My guess is that it’s going to be business as usual for industrial and commercial customers. It’s going to be business as usual in Texas, and probably in most of the other 13 states with retail competition. And it’s going to be business as usual in all the rest of the US states that presently have no interest in moving into retail competition. I think I see increased skepticism growing about the benefits of retail competition and whether customers are actually benefitting or not.

I think there's an increasing emphasis in Australia, New Zealand, the UK, and probably New York, on the idea that electricity is a social good, not simply an economic good. It's a necessity. Fairness is important. These kinds of concepts are being increasingly stressed, especially for vulnerable customers in all these jurisdictions.

Now, I think, and some of my colleagues think, that many of these concerns are misplaced. The calculations don't justify the concerns that have been expressed, and often it's price increases or apparently unjustifiable price differentials that cause the concern. Nonetheless, those concerns are there. I think we're going to see increasingly severe interventions--clearly in the UK, very probably in Australia, possibly in New Zealand, and I think likely that has already happened to some extent in New York, and probably in some of the other 13 jurisdictions as well. I think that certainly there ought to be and there will also be more analysis, more research, and more evidence being produced looking at the data, which I think is very important--but whether this will be conclusive, I really don't know. And if I came back in another five years, after 40 years, to talk to my friends Bill and Paul, I really don't know what conclusion we'd come to. Thanks very much.

Speaker 2.

In your packaged material there are a number of articles which I have recently written, one which appeared in the last couple of days in Public Utilities Fortnightly, about the virtues of competition and the Texas ERCOT. Now, I recommend these to you with one word of caution. Back in December of 2016 I wrote a piece for the Dallas Morning News talking about how great it would be to have an energy secretary from an energy-producing state. [LAUGHTER] And in fact, one of the three pillars of my argument was Government Perry's defense of

competitive electric markets. So, take that as a backdrop to the pieces I have recently written, but I also talked about, in that piece in December of '16, not only the virtue of markets but also the importance of infrastructure development and the role that emerging technology plays in electric and commodity markets. It took me about 750 words to write this piece, and then I put it out on Twitter. Of course, everything goes out on Twitter these days. And someone tweeted back to me, that I needed 750 words to say three things: markets, infrastructure, technology. And I think that's the theme of my comments here today as well, as we think about where we've come in Texas from the beginning of competitive markets to where we are today.

And I would just touch on a couple of the inflection points that we experienced in Texas. In the very beginning we required the investor-owned utilities to separate into generation, wires and poles, and retail electricity, with the wires and poles piece remaining fully regulated and wholesale generation and retail being competitive. In fact, we required what was then Texas Utilities (TXU) and Houston Lighting and Power to change their names, so that a customer purchasing a retail product from either of them would not be confused, and think that if I don't buy from TXU (or what then became Reliant, formerly Houston Lighting and Power), and my lights go off and I report that, they're going to be slow to come get me hooked back up, because I'm not a customer of theirs on the retail side. And TXU was a little bit slow to change all their names, but they did, and they became Luminant, Oncor, and TXU Retail.

And we began, in January of 2002, full retail competition. I came to the Commission in April of '04. We were two years in. Having not really been in this space at all, in the first day that I was there, we began a \$5 billion stranded costs recovery case for Houston Lighting and Power.

And Speaker 1 touched upon this, but one of the critical elements of our transition to a very competitive retail market was the use of the price-to-beat concept. Having gone to California and studied what went wrong, and more importantly how it went wrong, our legislators and regulators crafted this transition period where the affiliated reps, those associated with the incumbent utilities, were required to offer the highest price in the market for a five-year period of time. That may sound totally illogical, but it was designed to create headroom, so that new entrants in the market would be able to compete for customers away. And, in fact, that's what eventually happened. Now, during that period of time, also embedded was the ability of the A-reps, we called them, affiliated reps, to change their pricing twice a year to reflect the change in the price of the commodity, primarily gas.

So here we were, sitting on the dais at the PUC. Every six months the associated rep comes in, requesting a price increase to reflect the changes in the price of natural gas. Technically, they could've requested a price decrease, but that never happened, and I have to tell you that this became a very tricky situation. These were probably the most tenuous of times during our transition to a fully competitive retail market, when the price kept going up, and folks were not switching away, even though they could save 50% or 60% by switching from an affiliated rep to a competitive rep. And I remember one hearing that we had when the then-chairman of TXU, a person who I came to know well and served with on the NRG board most recently, was asked what he thought about the latest price-to-beat increase, and he said, "Well, I don't think it's enough money because our profit margins this quarter were not high enough." I'm like, "Don't say that, OK? Just don't say that. Say, the statute allows me to change my price twice a year. And that is what I'm doing, and it's going to go away eventually and we'll have a fully competitive market." And

once we got past the price-to-beat period, and prices came off of the price-to-beat, we then had a fully competitive market. And that was just in time, in about the '08 timeframe, for a price spike. Four reps went out of the business, leaving their customers to be dropped to the provider of last resort (POLR). So imagine this: we've been telling you to switch, to go to another provider. You did switch, and then your rep went out of business and you got dropped to a POLR provider that's charging more money. That required us completely to rewrite our POLR rules, and I think today they really operate well. We've created this transition, where you're only going to stay on it awhile. You're not going to pay an exorbitant price, but it's going to be high enough to try to get you to switch to make another affirmative choice.

From there, we begin to tweak some of the rules, including those associated with switch holds and deferred payment plans, and really this was about mid-course adjustments in the rep rules to try to create a good balance between customer and retail electric provider. And in fact, during this period of time, for a long time we had something called the System Benefit Fund, which was about a half a billion dollars available to assist low-income consumers of electricity. That went away. The legislature took that money, in their wisdom, to help balance the budget, and our then strategy was to educate and promote low-income customers to choose a cheaper provider. And I'll tell you, today that is the strategy. No one really talks about reinstating the System Benefit Fund. The technique for helping low-income customers is to get them on a cheaper provider.

And it looked like we sort of had this thing on auto pilot, headed in a great direction, until the winter of 2011, the spring of '11 when we had sub-freezing temperatures in Texas for over 100 hours. And we ended up with rolling brownouts and blackouts, and of course we all got called

down to the capital to explain why we had not insulated our generation fleet such that it could withstand 100 hours of sub-freezing temperatures. And my response was, “Well, Senator, how would you like to be on that boiler deck in August when it’s 105, having secured and insulated it to work properly when it’s 22 degrees?” That’s just not what happens in Texas. It was a rare event. We need to have these generation plants working more properly in August and designed for that.

We came out of that with some consternation, but yet with the competitive market still progressing. And I would say today that in the last two legislative sessions (of course we only meet every other year in Texas for 140 days, a brilliant strategy by the way, others should adopt it) there has been no real legislation to alter or modify the retail electric market in Texas. I would estimate (these are my calculations on the back of the envelope), depending on whether you think the competitive market has saved a dollar or \$4 per customer per month, that of 400 terawatt hours of production, the average customer in Texas has saved between \$4 to \$10 billion a year recently. There’s been a tremendous wealth transfer. And, Speaker 1, I’m surprised by what’s happening in other jurisdictions with regard to legislators getting all worked up and involved in electricity markets. I ran two statewide campaigns, one in ’12 and one in ’14. I don’t remember ever getting a question about electricity. I got it about a lot of other stuff like, “Why don’t your railroads run on time?” even though the Railroad Commission has nothing to do with railroads [LAUGHTER], but the point I’m trying to make is that it has to a large degree become a non-event. And essentially, given where we are with the price of natural gas, things are looking pretty good.

Load has gone up 33% since the beginning of competition. Prices are down. Carbon per ton out of the electric sector is down, and the fuel mix is

more balanced than it was when we began this experiment. We roughly are getting about 39% from gas and 32% from coal. Nuclear energy is static at about 10 or 11, but wind is now at 17% and rising.

I would conclude with this thought. Competitive markets work, over time. They work well, but they require a steady commitment to their outcome, plus, as we did in Texas, you have to make investments in infrastructure, particularly T&D, to allow product to flow from producer to consumer. The prices that you see today in the ERCOT market fully capture \$10 billion worth of T&D investment over the last decade, about \$2.5 billion worth of smart meter investment, and about a half a billion dollars in software, nodal implementation investment. That produces prices today that are less than ten cents a kilowatt hour.

And in your package is a screenshot printout from the PUC’s price to choose website where you can go in and select your retail provider. There are a number of filters and screens. You can tell it if you want a fixed rate product, you want a variable rate product, you want an index product. Do you want a renewable product? Do you want a partially renewable product? Do you want a product from a five-star highest-rated rep like Direct, or do you want one from a two-star, what we used to call in NRG a “fighter” brand, a new brand in the market? Which one do you want? You can screen by all of those. What I screened by, and this is in your package, was a 12-month fixed-rate product from a high-rated entity, and I said that I would consume 1000 kilowatt hours a month. And the cheapest product that came up was 6.4 cents a kilowatt hour. Ladies and gentlemen, that’s hard to beat. That’s an amazingly low price. Now, there are caveats in this, you know. If you consume 500 kilowatt hours, the price is almost double that. If you consume 2000, it’s double that. But the choice is presented to you. You can make an affirmative

customer choice, and if you don't want to take that kind of risk on being too low or too high in your consumption, then choose a rep and choose a product with a higher price with less risk. Choose Reliant. Choose TXU. Choose Direct. Pay ten cents. Lock in for 12, 24 months. You can get partially renewable, if you want, or you can get 100% green. All of these prices are available, and today they are cheaper than when we began this experiment back in 2002. [APPLAUSE]

Speaker 3.

Thank you very much. One thing I'll just highlight is that those prices that were just referenced were delivered electricity. It's not just your generation rate. And people in the northeast, if you shop, you're shopping only for the energy component, so if you're comparing that 6.4 cents, that's everything you're ever going to pay. There's nothing else. That's distribution, that's transmission, that's customer care, that's everything.

So, I'm going to give the presentation as the practitioner about looking back and looking forward. I also went to the Kennedy School, I guess a little over 20 years ago. I had Bill as a professor. I always worry when I present here with Bill, because I'm not sure if I was a very good student. In fact, I'm sure I wasn't a very good student.

I worked at Enron for ten years, starting in 1994. My very first day at Enron, just to put a context around this, I had a meeting with Jeff Skilling, Steve Kean (Steve is now the head of Kinder Morgan), Terry Thorn, who ran our Transwestern Pipeline (the pipeline around to the west coast), and Bruce came to our strategy meeting, and there was this conversation about how these guys in California are talking about something and somebody needs to go fly to California and talk to the people in California. And everybody looked at me. And I was like, well, you know, this

is my first day. I'm not sure I'm the best guy. But, solo, I packed a bag and went to California, and I think I ran into Professor Hogan the next morning in San Diego.

So I've been in the policy arena. I've also run residential retail businesses in Texas. So, my company lives with the price-to-beat mechanism. We operate under the price-to-beat mechanism. And I hope our messaging was better than TXU's around that.

We're the largest energy services company. But the one thing that makes us unique as a multi-million customer supplier that serves people from Alberta to California, businesses in California to CCAs to Texas to New York to Massachusetts to Illinois is that we operate and serve those customers with no owned generation. So, many of my competitors are what we would call gen-tailers, so, they have a generation fleet. We're the largest non-generation-owning retailer.

And I'll just highlight two things. The world is electrifying more and more, and part of that electrification is around four things, which I call the four D's: we're digitizing the electricity grid; we're distributing the electricity grid; we're decarbonizing the electricity grid; and more and more (and this is the D that most other people don't get) we're designing the electricity grid. And that's where retail competition comes in. We're allowing individual consumers, down to the house level, to design the energy package they choose to have, and part of why I know that is because of the other point. We compete every day. I have no franchise. I have no monopoly. I have no ability to keep people. If they want to fire me, which is the greatest power of competition, they can fire me. Now, in Texas they can fire me today, if they decide to. In other states, it takes a little bit longer.

So our goal is really about helping customers reduce their use and be smarter and save money, and we do that in a number of ways. We have a behavioral DR program in Texas that gets huge attention from our customers. We provide a smart bill, and we provide a prepaid electricity product in Texas, leveraging the smart meters. NERA recently did a study that shows a 10% efficiency benefit from a daily bill to prepaid product. Now, I'm happy to put that product, a product people choose, against any other efficiency product that utilities put in the market and see who does better.

So why did we do this? Why did policy makers, the people in this room, restructure the industry? I mean, it's a challenge, because policy makers are doubting the decisions they made 20 years ago, often because the people that are now in power were not in power 20 years ago, and they have forgotten the horrific environment we found ourselves in as an industry 20 years ago. They have forgotten that it's really hard to predict the future, and they've forgotten that it's really hard to understand consumer desires. That's why we created this market.

And I've worked at a lot of companies that made strong arguments about markets over the years. Why did we do it? It was about choice. It was about the inherent problem in regulating a monopoly. It's interesting that the conversation now is about the discord or discontent around markets that have retail as opposed to the ones that have monopolies, because if you look at the economic result, we should be spending much more time on asking, why do we still have monopolies in retail services? Again, I think we've very clearly stated over the last 20 years in this experiment that there is no natural monopoly of retailing energy services. So why do we continue to allow it?

And, finally, I think it really was about economic liberalization. These are some numbers from

work by Phillip O'Connor. So, this is the residential weighted average price change 2008 to 2016. And I'll be the first person to agree that how you pick your timeframe is important for how you come up with the results. In the 35 monopoly states, from 2008 to 2016, residential prices saw about an 18% increase. In the customer choice jurisdictions, the 14 jurisdictions (about), they saw a little under about a 1% increase. To me, that's a pretty notable difference, and so when we say that we don't have any facts around this... I do think it's a fair question to say, "Well, was that the right timeframe?" Because clearly, you'll see some data later that shows there's some benefits of choosing 2008. And the outcome was not equal.

I'll be the first to admit that my industry does a very poor job of explaining our narrative, of explaining why we do what we do and how we do it. It's hard to explain it, because we're competitive. And the reality is I'm not always wanting my competitor, NRG, for example, I'm not sure I always want NRG to know what I'm doing. But the reality is that the gap that you see here is sizeable and meaningful and I think allows us to understand the direction of economic liberalization.

Customer choice has been meaningful. If you think about it from an all sector numbers point of view, the monopoly markets for all sectors, including industrial, commercial, and residential, the increase in this same timeframe was 14.95%. In competitive markets it was -8%. So, again, where you have more active shopping, because you may have customers that are more actively thinking about energy, the results are even more powerful. But the results aren't all the same, and I think this is part of the issue.

So, if you unbundle those numbers I've provided on the last page, this is what Dr. O'Connor looks at. He's sort of ranked the states in terms of

residential price percentage change, and I think our panelists from Texas should be very proud. Texas, of course, comes out on the far right, with about a 15% decrease. Again, the timeframe matters in terms of what's going on. On the far left you see other states, and so not all the competitive states saw price decreases. Pennsylvania, a state which is in many regards similar to Texas, for example. Clearly, there are things about where you start from, and which reform choices you made in the different decisions along the way, that impact the results. And I think Speaker 2 got this right. This result in Texas for residential customers recognizes that we have installed probably the most advanced smart grid in the world. We have installed billions of dollars of transmission. We have turned over the entire generation fleet. The gas plants that were running when the market started are not the same gas power plants that are running today. And you have competitive retailers earning a fair and reasonable profit to do what they do. And, with all of that, you still get a significant reduction. So there's something there, I think, or at least the data shows that.

It's also interesting to look at cases where there's a lot of discord. In New York, there's a lot of discord. And New York's residential prices are down, too, from 2008. Massachusetts' price increase is relatively low. Now, some other states...Georgia's had a price increase north of almost 20%. So, states that are doing absolutely better are asking what else can we do, and I think that's a fair question. Everyone says, "Well, Texas is different. You guys are different. You wear boots." (I don't wear boots, but some people do wear boots.) They say, "You know, you have your own wholesale market." Well, New York has its own wholesale market too, effectively. California maybe has its own wholesale market. They say, "You know, you just have a different approach to how you think about these things, and

so it's hard," people say. They don't want to do Texas.

So what we need is a good A/B analysis to say, look, where could we have a similar wholesale market, but inside of that wholesale market you have both closed markets and completely open markets? If we could do that, I think that would be a valuable piece of evidence to the marketplace. And, again, if I were doing that, I would ask for two things, right? And this is the real question. It's not, did you lower prices or not. Prices are going to go where prices go. You can't wave a magic wand and ride a unicorn into a world where we're just going to have prices declining forever. That's not the reality. In fact, as an industry we have this trilemma. We have to make a tradeoff in questions about affordability, sustainability and reliability. And that's a question. It's a tradeoff. There is not a perfect answer. We're not always going to have prices go down. If we want more transmission, we have to pay for it. If we want new generation, we have to pay for it. If we want better customer care and new products, we have to pay for it. It's a fair question to ask, how do you find all that balance?

So, in fact, what markets should do efficiently and effectively is, first, translate prices through from the wholesale level to the retail level, and, second, ask the question, beyond that cost of supply, do you constantly put cost pressure, cost minimization focus, on the other components of the retail bill? And, in fact, Texas does that. So this is a study (not well known but I'm referencing it at the bottom) by Peter Hartley and Ken Medlock from the Rice Baker Institute, who did a study last year. And this is a very dense picture, so I'm not going to go through it. I would ask everyone to pick up the study. It's not a long study. But what they looked at is a comparison of competitive to closed areas in Texas. People say that Texas is competitive. Well, that's not exactly true. People that live in Austin are burdened by

the fact that Austin Energy gets to make all of their energy decisions for them. People that live in San Antonio have San Antonio CPS. So, there are munis and co-ops. And so the relevant comparison is, what has happened over the timeframe between similar retailing enterprises that face the same wholesale market? And, in fact, if you look, the bottom lines on the chart are the wholesale prices. The big dashes were the wholesale markets. And the other thing about this study that Ken Medlock and Peter Hartley did, is they looked at it from the full time scale, from 2002 to 2016. So we have the price-to-beat environment, and as a retailer and somebody who ran the retail business for Direct Energy through the winter that you spoke about, and through the summer, and through a hurricane, I'm a little bit experienced about how these different price points impacted my P&L and my customers' prices. You know, I'm still proud to say that I never priced my customers above 19.9 cents a kilowatt hour all in, even though there were people in my organization that maybe wanted me to, because it was cost recovery and justified, but I didn't do that. And that's what competitive retailers do. We don't just think about raising prices forever, even though there are people that believe we do. We make business decisions to help our customers.

So, the lower line on the chart is the wholesale price. The lines above are the retail prices from competitive parts of Texas, or ERCOT's, market. And the dotted lines are the munis and co-ops that faced basically the same wholesale market that we faced. What do you see? You see two things. Wholesale prices are translated very efficiently into the retail market. That's what happens. We're not allowed to hold prices up. We are not able to contain that, because in fact every day the website that Speaker 2 makes me put on my bill to tell my customers to go shop from other people (not that I'm still upset), that I pay for, [LAUGHTER] as a large provider with that

obligation, which I'm happy to do.... I'm happy to do that, because I want people to be informed and educated and making good decisions for their families and for their businesses, so you see that that wholesale price passes through, which is exactly what we expected, I think. And the second thing you see, and it's harder to pick up, but please look (it's an econometric study, a peer reviewed study) to see what is probably the most interesting result...I ran one of these retailers in a very vibrant market. Every day I walked in the door I had to figure out how to cut my costs a little bit more and share that with my customers. That's what I did every day. You can ask my wife, because she'll tell you how I thought about it every single day. And what happens is you see that, in fact, the difference between wholesale and retail prices is shrinking for the competitive markets. On top of that, we're innovating products, too, which is what Google does. Google makes profits and what do they do with those profits? Well, maybe they turn them into cool gadgets like your Google Home, which, you know, allows me to ask Google all sorts of interesting questions. And that's what we've done in Texas.

And so, there is a very clear A/B environment, facing the same wholesale market, which demonstrates, quite capably and quite adequately, that in fact competition works exactly as we predicted.

So, why did it work? What did Texas do well? Here's the ten things that Texas did well. 1) They gave consumers choice. Not all consumers, and, again, it's a value choice. People in Austin are making a choice, and it's their right to make that choice, to say, "We would rather have a group of managers in the city buy a wood pellet power plant in East Texas and run those costs through, than allow ourselves to take full advantage of the competitive ERCOT market." That's their choice, as people behind a muni. Maybe not the

choice that I would ask my retailer to do, but that's one thing. 2) We ended the distribution wires role in the retail business. Again, does anyone here believe there is a natural monopoly in retailing electricity services, after 20 years of experience? 3) We've transitioned all the rate payers to competitive retailers. OK, we'll talk about that. 4) We made sure that retailers can bill, you know, and there's this interesting dilemma. It seems to me that one of the attacks on competition in the Northeast is the complaint that the utilities effectively buy retailers' bad debt, in that they bill for us. The irony is that companies like mine, and I think companies like NRG and most of the companies in my industry, want to bill our customers across North America, but the regulators, or the policy makers, have said no to us for 20 years. But I'm happy to take on that responsibility. I do it every day. And we compete on that value. 5) We created a partnership with the distribution wire company. When I go visit the wire companies, I'm not out to get the wire companies. I'm not trying to. It's a partnership. We work together. We have to work together to make it right by customers in Texas. 6) We put smart grids in, and 6) because of the smart grid, you can fire me in a day. And I think, if we can all agree on one thing, it's that we should be working as an industry to make sure that, if I don't please a customer, they can fire me in a day. You know, you can choose to go to Target instead of Amazon, if Amazon drops the ball. In electricity, in most of the country, I can't fire you. When the polar vortex hit, it took two months to fire your retailer. It doesn't make any sense. 8) Strong protection, strong enforcement. 9) Known and measured stranded costs, which I think we can all agree on, and finally, 10) a provider of last resort. So, I am an involuntary provider of last resort. If one of my competitors fails, because they didn't adequately provide for their business, I have to acquire their customers at the end, overnight if they can't find other arrangements, and I serve them. I often lose money on that. That's not one

of my key acquisition strategies, just so people know. That is not what I'm trying to do. But it works well. Recently, a retailer did fail in Texas, a company called Breeze Energy. Breeze Energy was a 100% wind seller. The irony of Breeze Energy failing is that it was four coal plants that shut down the market that made them fail.

But the other thing, and Speaker 2 mentioned it, is just the consistency of support of markets in Texas. Outside of Texas, there's a growing discord. I think everyone knows that. I do think New York provides the best framework for trying to understand what these conversations are about, what are the issues. This is my view, in terms of trying to understand what the New York Public Service Commission staff is saying that retailers are doing poorly or failing to do. They believe that we're "overcharging" customers. I'll talk about that. They believe that we don't operate in a workably competitive market. They believe that we don't offer innovation. They believe that there are deceptive activities that go on. They believe we don't want to help low income consumers, and that we generate bad press. That's my understanding.

On overcharging, look, this is a great use of the term, because it's catchy in the media, but it's just a false understanding of the word "overcharge." It's not an overcharge if I price my contract. And I think that relates to the question that Speaker 1 talked about in the UK, the idea that there's a "detriment" there. It's easy to put one number and another number into a spreadsheet and subtract them and add them up, and suggest that anything above the utility default rate is an overcharge. But that is not, in fact, good economic analysis, when you think about all the things that Speaker 1 mentioned. It's easy to do it. It's the wrong approach. If you want to have that kind of game, then I can do the same thing. If customers were active shoppers and went every month to the market and bought the cheapest product over the

course of the market in New York, then you'd have an \$18 billion gain against the utility default price. The reason I don't like this is that my company doesn't compete on price. We compete on value. And I think that's the real problem with this analysis. At best, it's apples to oranges, and at worst it's disingenuous. And I'm happy to have a real conversation, but this is not it, unless you're willing to really think about what goes on. If you want to talk about whether wholesale prices translate quickly and efficiently to the retail price and whether you put downward pressure on the gap between retail and wholesale prices, I'm happy to have that conversation.

In terms of whether the market is workably competitive, staff put out some testimony that used HHI analysis. It's the only place, interestingly enough, that I've seen retail regulators look at HHI. I think that's a fine effort. Staff's numbers were very high, mainly because they didn't properly account for the fact that if you're a regulated provider with 80% of the market, you should put zero in the HHI calculation. When you do the calculation properly, John Morris, the witness that Direct put forward, an antitrust economist, calculated HHIs of 151 or 160. Does anyone in the room believe that an HHI of 151 or 160 is not, in fact, workably competitive?

Finally, there's the claim that we don't offer innovative products. The footnote on the bottom of the slide is a link to the PSC's website, where they talk about the innovative products retailers offer, then they go back and say, but these are not innovation. They say fixed price is not innovation. I'm like, managing the price risk of the most volatile commodity in the world is not innovation? I think it is innovation. Providing a green product is not innovation, because maybe it's only in Oklahoma, or it's only in Pennsylvania? I really wonder about it. Is the goal carbon, or is the goal something else? Adding a

Nest thermostat to a two-year fixed-price product is criticized by PSC staff saying customers would be better off if they would take the default price and then go to Home Depot and buy their own thermostat. This is really an opinion from a focus group of one. I've learned quite clearly that I'm not a really good understander of what my customers are always going to want to buy, because I have my own background, my own situation, my own everything. So you don't use one person as a focus group.

So, the other way to look at the problems in New York is to compare New York to what Texas did. There, they get about the grade that I got in decision analytics with Professor Hogan. So, I would argue that if you want to do it, there are things we can fix, there are things we can work on. The New York Commission, since '04, has been talking about a lot of these changes, we just haven't done them. I think that's very fair. Around deceptive activity, if there are providers engaged in deceptive activity, let's go find out what's going on. Let's make sure people get educated. What are the choices? Staff proposes that the best thing is to price my products, all my products--fixed price, thermostat products, green products--at my competitor's price, utility default. A price cap is one thing, but pricing at a competitor's price, which is an irrational competitor because they make zero money, I'm not sure how that is competition, and it's not transparent. If you want to shut down the market, just shut down the market. I think it's fair to fix the problems, or maybe we should go to real competition.

Just in conclusion, I think the choices we made and the reasons we made them are still valid today. The reality is, as these outcomes become more transparent for customers, we learn more things, and I think it's very fair to say, what can we do to make it better? We will have different outcomes. Some people will pick a three-year

fixed price at the low of the market, and some people will take three-year fixed price at the high of the market. That's just the way markets work. What I want to make sure is that whenever they pick the product they choose to pick, that there are competitive pressures on those products. And that way they get the best outcome they can possibly get for themselves. And I would ask that we finally do have an analysis that looks, in an A/B setting, with the same wholesale market, at closed markets and open markets. I think it's very transparent, with the economics the econometric model shows, that it's doing the two things we want to see happen. Thank you very much. [APPLAUSE]

Speaker 4.

Thank you very much. You've heard two proponents of competition in the electricity market. Both have close ties to, and relied significantly on discussions about, the Texas market. The Texas market is a unique market in terms of how restructuring markets have occurred in the United States. There is no other state that is going to adopt the Texas market, for a whole variety of reasons, and to focus on that, to the detriment of what's actually happening in the retail electricity markets in all the other restructuring states, I think, doesn't give a really good background or capacity for evaluating what the topic is today, which is the retail energy markets.

I'm not going to talk about restructuring in the sense of eliminating the local utility's ability to own or operate generation resources. That train has left the station in the 15 or 20 states that have adopted that model, and the issue before us is not that, although we're in the midst of a complete revolution as to how those markets operate. But that is not my point. I am looking at what is actually happening in the retail electricity market in particular.

I've been involved in these markets since they were initiated. I was a consultant to Pat Wood at the Texas Commission when they adopted their original consumer protection and licensing rules. I've worked in Maine, Pennsylvania, New Jersey, most other restructuring states, frankly, on these issues.

So I know the good faith effort that regulators and policy makers have made to try and create a competitive market for the sale of generation supply to residential and small commercial customers with proper boundaries that are associated with classic consumer protections that apply to other products that we buy in the retail market. And they built those protections based on those kinds of precedents. The point I want to make is that they have not worked, however much in good faith they were intended to work, and however much they keep reforming them and updating them and plugging the holes in the new dike that have been created, it has not worked. And the reason why we know it hasn't worked is because every publicly available study of residential prices paid by those served by retailer suppliers, on average and over a reasonable period of time, document that those consumers pay more than default service.

I'm going to talk about default service and why it's there, and why it's not going away either, in a minute, but the point I want to make is that default service is wholesale market service. It is not a utility service. It is procured in a competitive, transparent and open competitive bid process, pursuant to a portfolio that in many cases is mandated by state law, because the notion of passing through short-term wholesale market prices deposed two governors and lots of commissioners when it happened. So that's not going to change quickly either.

Let me go back to my presentation. This is a long story from an Illinois consumer advocate that

happened this year. It is a story that I have personally looked into in almost every state in which I've been a consultant on specific supplier investigations, some started by the commission, others by consumer advocates, with a wide variety of suppliers, and this happens everywhere. This individual walked in to get some assistance with helping to pay her utility bills. She's low-income. She qualifies for the national LIHEAP (Low Income Home Energy Assistance) program. Her electricity bill was being provided by a supplier who was charging her 13.13 cents per kilowatt hour. The current default price at the time this woman walked in the door was 7.18 cents, not Con Ed's price, as this story makes you think. That was passing through the wholesale market price for default service that Con Ed was required to obtain, pursuant to policies of the Illinois Commission.

So I have summarized here a number of similar cases, and can provide documentation for all of these examples. New York, Pennsylvania, Connecticut, Maine, Massachusetts, Illinois...over and over again, every single study of what utilities actually bill for suppliers through the purchase of receivables program versus what the utility would have charged on default service. Millions of dollars, and stories like the one I presented on the front page of my presentation. These are not polar vortex prices, by the way, although that was an even more outrageous and worse situation, where suppliers in Pennsylvania and New York and other places passed through 20 plus cents per kilowatt hour to customers who had signed up with a three-month low price contract, followed by a market price passing through their costs in the wholesale market, pursuant to a formula that they could never document in litigation and that no one could ever replicate.

So what was the purpose of our creation of retail markets in this country? It wasn't to allow people

to earn miles on their airline card or get a discount at a local restaurant or support their local team or even get a Nest thermostat. It was to lower the price of generation supply. Those are the words in the statutes that govern retail competition in most states. Not value, not alternative services. It's lower generation supply prices, and that's how it was sold to the policy makers and the public in this country.

Suppliers cannot compete with default service that is purchased in a competitive manner in the wholesale market. Think about it. How can any middleman charge a lower price than the wholesale provider? I mean, that's just basic economics. They've got their marketing costs, they've got their consumer protection costs, they've got their management, they've got their portfolio they have to pay for, and they have a profit. And you can't, in a classic economic classroom, somehow predict that those folks, however well-meaning they are (and they're not all crooks...well, some of them are [LAUGHTER]. No, a lot of them are, it's just hand over fist. Well, I don't know who's here, you know... [LAUGHTER])... But my point is that however well-meaning the intent, and however people understood this market was supposed to work, it doesn't work like that.

So, suppliers have a default service in every one of these states. Direct Energy and others have gone to the state regulators and said that default service is the problem, "We can't compete with that. It's artificially passing through low costs. They don't have the same costs we have." But that has not worked, and I don't think it is going to work, because, back in the day, we had some pretty clear stories about what happens when you price default service based on short-term volatile wholesale market prices. But now the line is, "It's not price. Forget price. That was never really what we were about," even though that's exactly what they were about. That's exactly what they

promised, and that's the basis for all the legislation. Now the issue is value. Well, why can't we regulate this market to actually obtain consumer benefits? What is it that's gone wrong here? Is electricity so complicated? Is this something that we ought to be looking at in terms of how we did telco or airlines or railroads or whatever? Do we measure the market based on migration rates alone, by the number of suppliers, by the complexity of their offers? Are they getting something that they can't get through a more regulated electricity service?

I'm pointing out some obvious aspects of the electricity market here. Why is electricity different? Speaker 1 said it. It's a public good. It's an absolute necessity of life. If you don't have electricity in your home and you can't afford electricity in your home, you are going to have health and welfare effects that reverberate throughout our economy. You're going to die if you don't have electricity in certain parts of our country. The argument in Puerto Rico, was it 3,000 deaths, was it 5,000? Think about this for a minute. The lack of electricity in that part of our country has contributed to thousands of deaths that are unlikely to have occurred otherwise.

Restructuring happened from the top down. It was not a bottoms up consumer movement. So most people haven't changed what they want. They want reliable electricity at an affordable cost. They don't really care where it comes from. They want what it does for them. And, let me say, electricity prices are very regressive compared to our tax systems, in theory. The poorer you are, the higher percentage of your available household income goes for this vital service.

The other thing I would point out is that consumers today are overloaded. Somebody showed me a study. 10,000 brand messages a day are bombarding us from one of our social media platforms or another. There is little engagement

with the electricity bill. Little. Some famous studies allege eight seconds a month. You know, half of Americans pay their bills online. They don't even look at their bill. They just press a button and pay it. So the idea that somehow we're educating people on all of these alternative electricity plans is silly. It's just not happening.

The suppliers are not helping the matter, the ones who maybe we'll agree are not in the room here, but they have been repeatedly sued by attorney generals and faced formal proceedings at their respective public utility commissions, but the bottom line is they can't compete at the local level, with the middleman problem with wholesale market prices. So what do they do? It's the classic bait and switch. "Take me now, I'm lower than the number on your bill." The minute a door-to-door salesman comes to your home for this product, the first thing they're trained to say is, "Go get your utility bill. I want to talk to you about your utility service." And they point to something, and they tell people that they're going to offer them a better deal, a lower deal, a more responsive deal, and basically they sign them up for a contract in which for some period of time they have a lower rate, but the contract itself says at that point you will be charged a wholesale market price that we will pass through to you, and you don't know what that is, and they don't tell you what it is. So how do they keep their customers? The renewal policy that states have allowed is a negative option. You get a thing in the mail and it says, "If you don't do anything you're going to have this happen to your electricity price." Most people don't understand it. They think it's another marketing ploy. A lot of consumers think it's another unsolicited solicitation, and they toss it.

And so what happens is, the supplier has the right to bill through this unregulated service through the regulated utility bill--and I don't have a problem with that. It's the next step that consumer

advocates have a problem with. They can disconnect for nonpayment of the unregulated supplier bill. So the woman who's paying 13 cents a kilowatt hour, versus the local rate, which is seven or eight cents a kilowatt hour, is being disconnected for her nonpayment of that 13 cents per kilowatt hour. No greater scam has occurred to Americans in our lifetime.

The suppliers say, "Renewables. We're offering renewables," and some of them do. But every state that I know is mandating that everybody sells renewables. The renewable energy mandates in most states are fast approaching 50% or more and in some states are being put up to 100%, no matter what the cost is. But here's the other problem. Suppliers don't tell customers where their renewable energy comes from. So, there's a really well-known supplier in New York who is selling renewable energy at a higher price to its customers, but they don't tell the customer (we had to find out) that that renewable energy is a wind plant in a market that doesn't interact with the rest of the United States in terms of transmission lines. So what is it the New York customer thinks they're getting? They're not getting anything that would benefit the New York wholesale market in which this customer is located.

What about fixed price offers? Peace of mind, that's the line. Peace of mind. But you're asking people with a high school or lower education to make a decision about whether something that might be a good deal for a couple months is going to be a good deal for two or three years, because default prices are going to change in most states every six months, or every quarter, and they reflect a balanced portfolio of wholesale market contracts. They don't change radically from quarter to quarter, but over a period of the two-year contract, the risk is that the customer may or may not be getting a deal, and they don't know. They don't know. It's not a rational decision. My

investigations of suppliers in many states have confirmed that they mislead customers about the nature of this deal. They haul out old charts about the volatility of the wholesale market and imply that that's what utilities are doing to them, and that is just a lie.

What about offering value-added services? Now, the New York Commission took a year and a half to look into the allegation that suppliers were offering value-added services to justify their higher prices. And they had every supplier in New York who wanted to be at the table at the table, and they found that whatever it is that they were offering, none of it had to do with lowering the price of electricity. So that's the point of restructuring, and products that were being offered could not be documented as having any impact on lowering the overall price of electricity or the customer's bill for electricity.

What about time-varying rates? Demand side services? All of these things are legitimate opportunities for consumers today, if you have smart meters installed in your state. But what they want is for the utility to provide all the details about those time-of-use rates on their bills, but they can't guarantee how many people are going to sign up for those products. And we know from longstanding experience that the vast majority of residential customers are not interested in time-of-use rate products, which have been around for 20 or 30 years in both regulated and unregulated markets.

What about efficiency and helping people lower their cost of energy? Well, in Texas, if you do that, you get a penalty on the charge you pay for electricity. But my point is, the distribution service in every single one of these restructuring states includes money for efficiency programs. Why should people served by a supplier pay twice for something they're already paying for?

The Texas model is one that you've heard about in some detail. I can assure you that it is a model that consumer advocates across the country have testified in opposition to, wherever it has come up elsewhere. There are some unique aspects to that market model that allow it to make some of the claims that have been made about it. The distribution utilities were eliminated from any retail interaction with customers. They were not just ordered to divest from their generation supply portfolio. They were ordered to eliminate their ability to talk to, bill, and interact with retail customers. So they are wholesale providers in Texas to the multitude of retail electric suppliers that actually do bill, talk to, enroll, and handle customer complaints with residential customers in Texas. There is no default service in Texas, and, of course, that is the major concern that advocates have about that market. And Texas regulates its own wholesale market. Now, I know that there are allegations that New York has similar power, but I don't think it's comparable. I don't think we need to talk about it in any detail. The point is, Texas is an energy-only market. It's quite unique, compared to any other wholesale market in the US.

So, what's going on in Texas from the consumer protection point of view? And this is strictly my gathering of stories from talking to advocates in and around Texas for many years. The original consumer protections were eroded. Now a retail supplier can put a block on your ability to select another supplier if you don't like them. You can't fire Speaker 3, really. You can only change the name on your bill. You can't get rid of what he charged you. Suppliers impose fees and charges for calling the call center, for getting a duplicate bill, for engaging in discussions about payment plans, and other matters. The basic service offered to low-income folks that's so-called cheaper is prepaid electric service, in which you are not required to pay a deposit and certain other charges to get on that service. But, of course, you

have to pay to feed your meter, and you have to pay every time you purchase credits for your meter. And you are disconnected without, in my opinion, sufficient protections and oversight.

In Texas, the suppliers get the subsidies to offer efficiency programs. And there's really little or no demand response programs or serious efficiency programs in Texas at all. Why? It's an energy-only market, and the suppliers make money by selling kilowatt hours. The benefits that have been put up on the screen for you are the benefits of low-cost gas and wind in Texas, and maybe the nukes, too, I don't know. But the point is, all of those benefits are associated with restructuring, getting the old, high-cost power plants out of the utilities portfolio, and setting in motion that wholesale market that we're talking about today. They got lucky. They got really lucky. And in every state in which markets are showing the impact of lower cost renewables and wind, the same thing is happening. The same thing has happened in Pennsylvania.

So, is this problem solved just by protecting low-income people? We can do that in a variety of ways. We can give them ratepayer subsidies to help them pay their bills, but if we allow them to select suppliers who charge more, the customer is paying a higher bill, the ratepayer is paying a higher bill--what is the point? And you've reduced the amount of funds available from LIHEAP, which is a set amount each year and has to be spread out among however many people it can find to provide their once-a-year bill payment assistance program. So the documentation about the impact on low income customers from high supplier prices is particularly concerning to consumer advocates. But, as I said, allowing them to remain in the market, subject to the whim of suppliers who talk them into enrolling with them, is not an answer that consumer advocates are willing to accept.

There's a growing move and an awareness about this. New York has gone through two years of attempts to stop it from suppliers appealing it to the courts, but New York is implementing the rule that any supplier who seeks to serve known low-income (and that's people who are enrolled in the utility discount and LIHEAP-type programs, it doesn't include the vast number of people who are not enrolled in those programs who are also low-income, but, be that as it may, if you want to serve those folks, you have to get a certification from us that you are going to charge lower than default service over a 12-month period. And about five or six of them have, and that's it. And if you go to the New York Commission website and you say, "Low-income options," you are presented with the ones from those certified suppliers.

A recent order in Pennsylvania cleared the way for the adoption of similar programs in Pennsylvania. We shall see what that commission chooses to do with that authority interpreting their restructuring law.

But my main point to this forum is that this is not about restructuring. It's not about rewinding the wholesale market. It's not about getting the utilities back into the generation business, although that's what is happening right now, and in the recent past, with ordering to pay for coal and nukes and so forth. But my point is, we don't need to rewrite our experiment with that part of our reform movement. We can just rely on passing through competitively acquired wholesale market prices to residential and small commercial customers. We get all the benefits, if there are any, in the restructuring movement, in the pressure in the wholesale market to keep prices low and operate to keep the low-cost providers in business and drive out the high-cost providers, and it's just a simple answer.

Now, I understand that the statutory mandate in many of these states would need to be changed to implement this approach. But New York does not have that mandate, and that is why they're in the business of exploring this approach. But the other states would need state statutory reform to do this. And I appreciate the good faith efforts of all those regulators to try and implement this market, but the growing evidence is that there's not much to point to in terms of benefits.

If we continue the current process, my recommendation is that we eliminate the purchase of receivables program. It is the single tool that suppliers have relied on most to pass through those high prices that customers have no idea are high and get the utility to collect their bill for them.

I've pointed out some publicly available data I just gathered a week or so ago about the status of migration in the states, and it is correct, as the Speaker I pointed out, that Ohio and Illinois have numbers that look really high, but that's mostly due to their municipal aggregation programs, which have come and gone with the ability of the municipality to get a good deal from a supplier that doesn't end up costing folks more money, based on default service. But it's pretty low. Massachusetts has a real high rate, but the Attorney General there has just called for an end to the retail competitive market and documented millions of dollars of overcharges, higher prices, you can call it whatever you want, from retail suppliers, compared to default service. So, I'd be happy to answer your questions. I appreciate the opportunity to make this presentation and inject this concern onto your agenda. Thank you very much. [APPLAUSE]

General discussion.

Question 1: My question is for Speaker 4, and I'm wondering, is your concern solely

with residential customers who are not as sophisticated, and not believing, philosophically, that they shouldn't have a choice, but you're OK with a standard offer service auction, like the New Jersey BGS, you know, commercial and industrial large customers participating in the retail market? Or do you think, you know, that Southern Company is the right market structure, or MISO, as most of MISO doesn't have retail competition?

I'm just trying to understand, because, you know, in one sense there's the political philosophy discussion between, you know, Speaker 2 and you about choice and protecting consumers, but that's almost a narrower public policy issue than the broader issue of whether there should be retail competition or not.

Respondent 1: Well, I think the issue I've been discussing is the first and only issue that should be talked about, not some theoretical discussion about retail competition. No, my presentation was strictly aimed at what the New York Commission calls mass market customers, which is residential and really small commercial customers. The small commercials, the 25 KW and below, are typically marketed and sold and billed and collected in the same manner as residential in most states by suppliers. They go down the street. They hit the local dry cleaning and the local mom and pop store, and then they walk down the neighborhood, and they talk to residential. Many of it's the same kind of product and concern. I am well aware of the fact that larger commercial and industrial customers are professionally engaged in obtaining the best deal that they think

appropriate for them in the retail market, and I don't purport to make a recommendation about that, and I could conceive of different public policies that would apply to those two groups, yes.

Question 2: Just a clarifying question. Speaker 4, you referred to voluminous numbers of studies, and yet I didn't see the cites, so maybe you could give us a bibliography of those studies that you referenced, and maybe the Harvard folks would be good enough to send them out for everyone?

Respondent 1: Sure. The last page has the Massachusetts AG study and a cite to the Bangor Daily News report of the Maine study. I cited the New York staff reply brief, which summarizes their analysis. I pointed you to the NCLC report on supplier prices, which has much of it in there from Illinois and Connecticut. I have the Connecticut one on here. I'm not sure what more I have. The Pennsylvania ones I can give separate citations for, because they're involved in the analysis of some retail enhancement programs that have been ordered by the Pennsylvania Commission, called the Referral Program, in which advocates have documented that customers have been harmed by those programs with higher prices. So there are a few more that I could give you, but mostly the bibliography will take you to the larger ones.

Questioner: OK, because there are some others that perhaps would offset some of the things like the Mass AG. But OK, thanks, we'll use those.

Respondent 1: I would love to hear about any other studies of supplier-billed prices versus default service.

Questioner: I think Speaker 2 and Speaker 3 both had a bibliography as well.

Respondent 1: Right. Those were not bibliographies of studies that looked at actual billed prices by suppliers versus default service. None of those studies did that.

Respondent 2: Well, just to be fair, though, you referenced the New York staff analysis of their overcharge, and, again, I would just fundamentally disagree with that term. I mean, it's a great term for media purposes, and I think everyone should understand that it just doesn't make any sense. But if you want to go there, which I don't, because I don't want to talk about price, because price is not the sole reason, and if you want lower prices forever, then there will not be an electricity grid. But if you want to go there, there is another piece of testimony in the New York PSC review that showed \$18 billion of value if customers were actively choosing it, as opposed to being scared to not make a choice. So, I mean, I'm willing to put my \$18 billion against the \$1.3 billion of staff. That number I can compare, right?

Question 3: Thank you, and thank you to this panel, which I very much appreciate, and I think presents a number of interesting challenges. I actually wanted to start, though, with something which is a really clarifying question for Speaker 4. Speaker 4 and I were talking about it, but I'm still not clear as to what was said.

So let me present three alternatives, which I think are consistent with what you have said, and I'm not sure which one you meant. And let's set aside Texas and focus on New Jersey, which has the Basic Generation Service (BGS), a default service which has this rolling auction slice of wholesale market prices and so forth going on. And I can imagine three alternatives. One is that the BGS is mandatory for residential and small commercial. So that's it. That's what they have. Another is that it's opt-out, so that residential and small commercial have BGS as the default, if they don't do anything, or they can choose to go to Speaker 3 or anybody else that they want to. So that's the second model. And then the third model is that they can opt out, but Speaker 3 is constrained as to what he can offer them. He has to have offers which are less than the cost of the Basic Generation Service, or something like that--these caps that were described in New York. These seem to me to be three distinct models. They all of them involve being compatible with the wholesale market, but I'm not sure which one you're supporting. Or is there something else?

Respondent 1: Thank you. The second option is, in fact, the law of the land. Default service is the default service that everyone in New Jersey has, unless they choose an alternative supplier. And that's true in every jurisdiction except the Texas market model. So that's the one we have, and that incents suppliers to come into the market and give them advantages. Rate payers have paid for their ability to exchange data with utilities, to submit enrollments and get past usage history, and to bill and collect, and the ideal was that these suppliers would come into the

market and offer lower prices over time and lower the price of generation supply. And so that is the market model that in my opinion has not worked.

So there are two options. One is, let's just get away from this entire notion of offering competitive electricity service to residential and small commercial customers, and provide the wholesale market price to them pursuant to these various state-mandated portfolios. The third option you mentioned is legitimately on the table, and that is that suppliers can be in the market, but only if they provide a lower price than default service. I question whether the cost and impact of that model is "worth it." That's my only concern with that approach.

New York has taken that approach with its low-income customers. We shall see what it orders in the context of the pending mass market investigation proceeding, but in either case, the first one or the third one, you would need some sort of state legislative mandate for regulators, I think, to adopt that outside of New York. And the reason why New York is different is because they never adopted restructuring by legislative mandate. They did it by regulatory mandate. So they have a lot more discretion about what they do and how they do it. So either one is fine, I just think, in the last analysis, that the first option makes more sense, is less costly to society, and doesn't really eliminate, in my opinion, much in the way of competition.

Respondent 2: I think that, with respect to option one and three, it's a separation through fiction. I mean, the reality is, if you make my competitor an irrational competitor, the price

cap... I mean, you can argue about whether we should have a price cap like what the UK wants to do. In the UK they're not saying, "British Gas is the price cap." They're not saying, you know, "SSE is the price cap." They will administratively determine some level that they think is appropriate for a fair competitor.

But if you believe that there's a distinction between saying, "There is no choice, and everyone's on default," versus, "There's a choice, but you have to be below default if you want to compete," that's a distinction with no difference, and so you will have no competition. Just to be clear, trying to create one, two and three options, one and three are the same outcome for consumers. They'll have no choice.

Question 4: For those of us that are concerned about sending appropriate retail price signals, is there a contradiction, for example, between suppliers coming in and offering some kind of hedge product (somebody described it as "peace of mind"), and actually sending real price signals to retail customers to signal incentives for efficiency, you know, the appropriate incentives for the use of energy? Is there a contradiction, and how do we deal with that issue?

Respondent 1: It's a great question, but let's use the Texas analysis, because I think it's probably the most relevant for that, right? So, a vast majority of my customers, commercial or residential, are on fixed price, because they want to insure themselves against the market. But that doesn't mean that meter doesn't face 15-minute price intervals from the wholesale

market. Speaker 4 said something about how I make all my money by selling more kilowatt hours. Well, if you're ever operated a retail business in Texas during August, you know you don't make any money in August, because when it gets hot, my customer uses a lot more energy than I thought they were going to do, and I have to go back and ask the ERCOT guys to meet my incremental load. And when I pay \$9,000 for that interval, and I charge much less than \$9,000, because I was on a fixed price product, I'm losing money. So that's why price signals are being translated effectively to retail customers--because I communicate that on their behalf. If I see a customer is using energy in a way which is vastly different than I anticipated, then I'm incented, in fact, to go out and work with them to get them back, through behavioral or operational changes or structural changes, to where I thought they would normally be operating.

And those large, large customers will in fact interface to the market directly. And I provide just access to the wholesale market for them, but they're making real-time longer-term decisions, and they're sort of living it.

For the mid-market and the residential consumers, I communicate to them through my activities and through the forward price of retail bills. Speaker 2 talked about pricing. If in January of this year you went to his website, you could find a ten-cent 12-month product. Today if you went to find a 12-month product, it would be about 14 cents, on average, maybe a little bit less, because we're signaling the forward market. So, in both the short term and the long term, I'm passing through those prices, because I face that risk,

independent of the product I've sold to my customer. And that makes it even more efficient, because I'm finding the right customers to optimize every day, as opposed to trying to do it to everyone, the way utilities have done it for years.

Questioner: Let me just follow up quickly. I think that's correct. I agree with that. But the question I'm getting at is, how does the customer actually get the signal? Is it just this sort of indirect price signal? Because what you're saying is, they're paying you a bundled price for all the kinds of things you just described, but I don't know that it tells the customer what they need to do to be more efficient.

Respondent 1: It tells the customer, because, if I need to (and, again, I'm going to focus on the larger customers first and then the medium-sized customers), I go to those customers. We have a business unit, Distributed Energy and Power (without giving away secrets to my competitors) that does nothing but look at the data of all of our customers every single minute of the day to try to figure out which one would be most advantaged by thinking about efficiency or an operational improvement. So, you know, some customers have relatively normal usage, so there's not a lot of advantage right now in going to talk to them. The ones that are off that, or where I see a bigger opportunity, I'll approach them directly, right? And then we do that through a lot of different means—through information, but also direct conversations.

Respondent 2: Let me just add, this is not a cost of service model, right? So, as a retailer,

I have to be cognizant of when that customer's term is going to expire, and what is required for me to keep that customer on either that product or another product, because the cost of acquiring a new customer is incredibly expensive. So, I'm looking at my competitors; I'm looking at my cost of supply; and then I'm trying to figure out how to price my product. Back when gas prices were rising, in the 2004, '05, '06, '07 timeframe, and I've written about this, the full price of gas was not passed through by retailers to customers, because they knew that they would lose customers. Customers would be unhappy, so that was a time period where the price of gas tripled and quadrupled, but the retail price did not—so this is not a cost of service model. Now, with low gas prices, is it a one-to-one relationship between the price of acquisition of my power supply and my retail price? No, it's not. Having said that, if prices rise again in the commodity market, I would expect that the full cost of that rise, that increase, doesn't get passed through.

Respondent 3: I think this question indicates where economists may have misled regulators. I think the traditional economic approach would tend to say that the correct price is a price that varies by the hour or by the half hour, and that is the price that ought to be charged. From my perspective, those of us who believe in competitive markets think the role is to try to provide what customers want, and if customers want a flat price, maybe a fixed price for a year, that is what these competitors will provide. And, in answer to your point about whether that will be efficient, I think Respondent 1 has given the answer. If the suppliers can find a way of packaging a product that reflects the cost of

provision more accurately and provides different signals to customers, and if the customers are persuaded, then they'll buy it. But if they're not persuaded, then that's not efficient from the customer's point of view, and that's not the way the market should be going, if it wants to reflect customers' perspectives. So, from my perspective, this is an example of the kind of thing that I was worried about back in 1983—that a regulator would decide what customers ought to have, whereas a competitive market would try to provide what customers wanted.

Question 5: I want to step back from the question of regulation or not regulation, because that debate started in 1880 when the first light bulbs went out because the centralized power plant in downtown Manhattan went out, OK? It's an essential service today. It's going to be regulated. The question that Bill Hogan asked when we originally started these discussions was, what's the best way to regulate it? And we finished that answer with, "for the consumer." This is all about the consumer.

And so I think you all got it right, that it's about the consumer, and that there are three things the consumer wants. They want the lights to come on when they flip the switch; they want it affordable; and they want it not to hurt them. That's environmental safety. And I heard a lot of discussion today, and I hear this all the time, and I've heard it for 25 years, which focuses, not on a balance of those three customer needs, but instead focuses on one or two, depending on the customer. One of Speaker 3's former companies sold this concept that you could buy renewables. Well, those folks, that small

percentage at the time, that liked the idea of buying renewables, paid for renewables. They didn't buy electricity. They didn't buy this commodity. We put charts up all the time about the price. Well, price is only one part of that triangle. You're balancing three parts of a triangle, and that's an important piece.

So the question I've got is, let's back up from asking, is it regulation or not regulation, because we can argue all day. If we back up and look at what the customer wants, is that what we're currently providing? That's the question. And so I'd like for each panelist to answer, what do you think the market is providing to the customer now, and what's the best way to go about doing that?

Respondent 1: There isn't anyone in this room who knows what the customer wants, OK? But in the political world, where these decisions are made, we have policy makers deciding what customers want in the form of statutory directives. So, we directed that we would have restructuring, and it was sold to people on the grounds that this would result in lower prices. And I think the wholesale market in Pennsylvania, for example, has delivered lower prices compared to regulation. I don't think there's much doubt about that. So there are some benefits that I would think most people would agree with.

With regard to other mandates, however, the minute restructuring was on the books, we had legislators demanding, and regulators imposing, surcharges on the distribution-regulated part of the bill for efficiency programs, renewable energy mandates, subsidies for solar, and various other, you know, flavors of the moment, because people

can't keep their hands off that bill. They've just got to have the ability to pass through those prices.

So, given all of that, and accepting that that's the world we live in, my little piece of this pie is, what does retail competition add to that mix? And I can't find anything. So it doesn't depend on what people want, it depends on adverse impacts that I've documented that I think most people would agree are not good things for people to suffer--higher bills than they would necessarily have to incur for the theoretical benefit of restructuring.

Respondent 2: I think, in the less regulated markets (so, hitherto, the UK, Australia, Texas, and so on), the market is providing what suppliers think customers think they want. [LAUGHTER] And the question that is increasingly being asked by regulators is, how far should we go if we don't think customers think they want the right things? How should we help them to see things more clearly? And how far should you go in providing more information, more advice, more cautions, more restrictions on the companies? Where do you draw the line between that and telling customers what they're going to have, because this is what's best for them? And that line, I think, has been shifting. How far it will shift, and whether it will shift that way everywhere, I don't know, but that has been shifting, and I think we have yet to see what the consequences of that are.

Respondent 3: So, retailers do our absolute best. Again, every customer can fire me tomorrow, so I have a reason to make sure the products I'm offering in fact are what customers want. Take prepaid electricity.

Many people in this room would say that that's a horrific product. Well, I can give you an anecdote of sitting on a call, listening to a woman with two babies in 100-degree heat, telling us that she had a \$500 bill that she couldn't pay. I know that my product, my post-paid product that required her to post a deposit, was not working for her family, because I heard it, right? So, we have anecdotes all around. So, 80,000 people, for our company, have now actively made an affirmative choice to say that that's a better product for them. Some people would say that's a horrible product. But that's a product they wanted. We created that product. We helped drive that product to market.

I can tell you that no customer I have ever served has ever said, "Find a product that looks exactly like the New Jersey BGS product and sell me that."

So, one of the things in our industry is, you'll talk about knockoff products. So, you know, Constellation or NRG or TXU comes up with an interesting product. TXU came up with a great product recently--solar days and free nights. Great product. That's a product that I would knock off. That's a product that customers are demanding aggressively in the market. TXU is innovative and thought through that product, and I give them credit for that. But there has never been a customer that says, "Hey, I want exactly the product that Con Ed sells on their MSC. Give me that deal." It's like, nobody wants that product.

So, when we keep saying, "Default service is great," there's only one thing I can tell you. There isn't a customer that's ever asked me to mimic the product in Pennsylvania or New

Jersey or New York or Massachusetts. That's not what they want. They want something else.

It's interesting, what Respondent 1 to this question said. We do have to nudge. That's fine. Where do policy makers want to take this market? I'm also certain, at least from what I can tell, that there are not a lot of consumers that want government exactly telling them what they can have or what they can't have. And, effectively, setting the utility as a price cap is telling consumers, "You don't have a choice of any supply." And I think choice is valuable, and I think that's what consumers want.

The only other thing I'll say is, in the 20 years this industry has gone through (depending on whether you take the '92 EPACT as sort of the start of this industry, or '78 if you want to go way back) what we've done is a pretty amazing thing, as an industry, to move as far as we've moved, in terms of how we've restructured wholesale markets, how we've brought retail competition, and the innovations we've brought in, and how we operate today, in terms of where we want to go. The next 20 years are only going to be more interesting, as we digitize and distribute and decarbonize and design the future. And that's what we're trying to create for consumers to help them get us there, because consumers will get us there faster than policy makers will nudge.

I mean, again, with my previous company, I wasn't selling a 50% green product or a 30% green product. I was selling a 100% green product to the consumers that wanted that. Why would we deny that to people that are

willing to go further and faster than the government to move in that direction? And so that's the question, really. What are the next 20 years going to hold for us?

Respondent 4: I don't know what customers want. But I know what they do not want. First, high prices. The cost overruns in building new nuclear plants that get embedded in rates in the fully regulated markets are a great example. One of the reasons we got competition in Texas is because of the South Texas Nuclear Project, which was supposed to cost less than a billion dollars, in 1980 dollars. It ended up costing over six billion. High heat rate, inefficient coal units, cost, cost... Overpriced "renewable" or wood pellet burning plants in East Texas that are embedded in Austin energy rates, high cost. Hunting leases, luxury suites at stadiums, again embedded in your rates. Those are the kind of things that they don't want. Those are the kind of things that get pushed out of competitive markets.

They don't want outages, so we focus, now, in Texas on the wires company, to make sure that they have what they need. That's why we spent \$11 billion in TDU (transmission and distribution utility) investments--smart meter, smart grid.

Third, customers increasingly want sustainability. They don't like pollution. So, what happens in Texas? Three coal plants were recently retired. Not after 20 years of effort from the Sierra Club. Low gas prices retired those three plants. So we get to the point where we're satisfying customers by eliminating the things they don't want.

Question 6: I have a clarifying question, and it's for Speaker 4. In the first page of your slide, it mentions the "default rate." What's in that? Is that just the energy piece of the bill, or is that the all-in kilowatt bottom line part of the bill?

Respondent 1: The price quoted in this presentation, from Elgin, Illinois, is the generating supply piece of the bill. In all of the restructuring states, the utilities have unbundled their bills, and they show you their regulated distribution charges and separately show you their generation supply default service.

Questioner: So it's like a phone bill.

Respondent 1: Yes. So I'm comparing apples and apples here. The 13 cents is generation supply, and so is the seven.

Questioner: Does that include a capacity market charge of 7.18 cents?

Respondent 1: That is a portfolio price from a laddered set of wholesale market contracts that are typically all requirements. So, whatever the wholesale market person bid in to provide that service is a reflection of what they have to purchase or deliver in the wholesale market. So, yes, of course it includes capacity as well as energy.

Questioner: OK, thanks.

Question 7: First off, I want to thank Speaker 4 for having the courage to come and deliver really good arguments in a room full of free market Zionists, myself included.

[LAUGHTER] And I'm finding a lot of common ground with what you're saying.

First off, I think that we need to retire this price argument. I think we all agree, especially the competitive retailers agree, that it's not about price, it's about value. Well, now the question is, what does it mean to be about value? And there's something you said that I disagree with, Speaker 4, which is that you don't see what the value add of competition is. Well, there's this nebulous word, innovation, and I'll make an attempt at defining what it is in a free market sense. If I'm willing to take a risk and put in money to do something that people are going to pay for, I should be able to do that and be compensated for the value that I create.

So, if we're assuming that default service is here to stay, and if we're looking at competitive retailers as really sophisticated players who have a lot of good ideas, and if we look at the change of technology being a lot faster than regulators and utilities and policy makers can keep up with, the question that I'm asking is, how can we improve default service? How can we reformat in a way where we kind of all win? And I have three suggestions, but I'm really interested in having a discussion. The first suggestion is a real-time price option, kind of what the previous questioner said, a little bit like what Illinois is doing. Thinking about price competition as obsolete might mean that maybe we move away from price competition and have a straight pass-through from the wholesale market, which would also make it easier for smaller entrants to enter. I try to work with a couple of retailers with very innovative offerings, and it's almost

impossible to compete in the wholesale market right now, between all of the credit requirements and all of that. So this would make it a lot easier for innovation to happen.

The second suggestion, and this is a tough one, is to really fully unbundle distribution and retailing, regardless of default service and all that, to just focus on that one question, because now we have a lot of new technologies like distributed energy and storage and all of these things coming in, and the landscape is shifting very rapidly. And if I have a new technology, and I want to offer it to consumers, but I'm also competing with the utility, because they're also serving consumers, it makes it really hard to really collaborate, the way you would in Texas, with Oncor and CenterPoint, because there are all of these misaligned incentives, because of these messy hybrids.

And then the third suggestion would be to eliminate barriers to competition, and I think the biggest one is access to data. And this is a debate that's about to change a lot, because, increasingly, consumers and aggregators and retailers have a lot more information than utilities do. There are new sensors coming into the market that are far more sophisticated than anything utilities have deployed, and they're going to be cheap enough for consumers to have them in their homes. And then they'll also be able to have insight about what's happening on the grid, so they can empirically *ex post* demonstrate that they should be compensated for services before requiring the rate design to catch up.

So, anyway, these are three specific ways that we could reform default service. I don't know

how you feel about this idea of having a discussion about how default service could be better, and I don't know what everybody else thinks.

Respondent 1: Are you active in the New York Reforming the Energy Vision proceeding, or aware of it? Because that's –

Questioner: I'm aware of it. Relative to a free market approach, REV is very expensive, has a lot of friction, and is taking a long time.

Respondent 1: Oh, yeah. It turned out not to be quite so simple.

Questioner: So, if we could use a magic wand and be in Texas suddenly and continue to implement that model the way that it's been going, rapidly, I think that we would get really good outcomes, similar to what New York REV is attempting to do, much less expensively. But, as you pointed out, that's very unlikely to happen, because political path dependencies have gotten us to a place where we kind of have to deal with what's in front of us. So that's the reason why I'm asking the question, should we be talking about default service as something we can improve upon, where then retailers can compete, but maybe they don't have to compete on price? They can compete on something else, like hedging products, or innovative financing, or new ways to use operational hedges through demand side management, or integrating with new types of reliability offerings by having on-site generation and black start capability, or offering data through their sensors to collaborate with the utility to help their state estimation, or a number of different ways.

Respondent 1: Well, I welcome you to go door-to-door in Brooklyn and try to sell those products.

Questioner: Well, there's a reason why I haven't been in New York lately. [LAUGHTER]

Respondent 2: So, we do go door-to-door in New York, and we do try to sell some of those products. In fact, we've invested in a firm called LO3 Energy, which is a blockchain-related firm, and they have something in Brooklyn called the Brooklyn Microgrid. And the irony, of course, is that they can't get anywhere, because it's just the friction of the REV. I mean, a process that started back sometime before I had gray hair...

I do think there's a challenge. I think you asked a fair question. I think that the idea that we want to restrict choice for any consumer makes no sense. And so, if we want to reform markets, there are things that need to be fixed. We should fix them, but we have to create an environment where those wants – who asked the question about wants?

Questioner: But you'd give up price competition?

Respondent 2: Well, I don't know what that means, because, ultimately, if I have a five-year fixed-price product, there's price competition on a five-year fixed price product because NRG is selling that same thing, TXU is selling that same thing, so –

Questioner: Yes, your company and your competitors are entirely billed based on competing with the default rate.

Respondent 2: No, that's not true at all. Look at my second slide. Nothing about how we compete is competing against default price. I don't compete with default price. I sell something which is completely different than default prices. Again, like I said, I've never had a customer anywhere in the United States or Canada say to me, "Hey, can you make a product that looks like the New Jersey BGS?" Why? They don't want that product. They don't want it. If they wanted it they would ask me to knock it off, and they're not asking me to knock it off.

Questioner: If you could take a direct pass-through from the wholesale market, real time, take that, and then hedge from that, where you don't have to handle any of the price underwriting, or any of that, would that be something that would be beneficial for your business?

Respondent 2: Again, if that's a product customers want. I do that today, right? I mean, I hedge. I do all the management of wholesale activities. We compete, and we have to find the needs.

I'm happy to have conversations about the right form of default service, if we need default service. I'll just make this final offer to the utilities in the room. For 20 years, you've had the default service the way you designed it back when you got your stranded costs. Now give me 20 years to design it, [LAUGHTER] and then let's have a conversation in 20 years about the efficiency.

Questioner: Just like Illinois.

Respondent 2: No. The reality is, I sat at the table in Philadelphia, in a tall brown building many nights with a little computer, trying to figure out how to set up the default service regime of PECO years ago, right? There are people in this room that know that I was sitting there, and, you know, there are people that know that Enron created an environment to save \$2 billion that otherwise consumer advocates were willing to charge rate payers that was only saved because Enron stepped in the middle of that train wreck. But we did, and they got their stranded costs, and then they set up a default service that they continue to operate, and they continue to have it. It makes no sense, so let's give me 20 years to set up default service, and then we'll come back in 20 years and see if my solution worked better for consumers.

Respondent 1: Let me just say that a number of states had the proposal that you just proposed, and it lasted until 2008, when actual wholesale market prices got passed through to residential customer bills in New Jersey, Maryland and a number of other states. The instant result of that experiment was the enactment of mandatory legislation from legislators and policy makers that would eliminate the ability to pass through wholesale market prices.

Questioner: So, now we need you to help us undo that.

Respondent 1: I have no interest in undoing that.

Respondent 2: Can we take this conversation offline? We have a lot of other people who want to talk.

Question 8: Speaker 1, you gave a great summary overview of retail competition everywhere, and that leads to one set of questions. And then Speaker 3, you know, you presented Phil O'Conner's data, which was very striking. I would note, just for the audience, that the largest increase is that nice cheap coal in West Virginia. I hope that wasn't lost on everybody sitting here in the audience. But that leads to a couple of different questions, and I'd like to get the reactions also from Speaker 2 and Speaker 4 as well.

The first question is, what are the properties in any of these markets that have led to what I would consider to be the most efficient outcomes in retail competition? Was it the fact that there was a menu of options offered for different rate designs and tariffs that would allow customers to choose, versus just competing on price alone, as we've seen in other places? Is it the fact that there are specific regulatory regimes in Texas, Alberta or the UK? It's one-stop shopping. Does that matter a whole lot? Does it matter than in most of these jurisdictions we have a well-defined provider of last resort, whereas in Texas, you know, basically everybody is turned loose at this point? Has that mattered?

I hate to use the term best practices, but what are the optimal characteristics to get the most efficient outcomes, given the experience that we've had to this point? That's the first question.

The second question is based on the Phil O'Connor data that Speaker 3 presented. It's interesting to see New Jersey and New York having slight price decreases, even though we hear a lot of griping. Texas, obviously, had the largest price decrease. Speaker 4 made a comment about how Texas just got lucky because of low natural gas prices. I'm not buying that argument, because if I look at Pennsylvania and Ohio, their gas prices are as low as, if not lower than, Texas. Wholesale prices have been even lower than they have been in ERCOT because of that, yet we're seeing price increases in those retail competitive states much higher than we have in Texas or some of the other jurisdictions. So, what is it that's driving those differences?

I think we have a great natural experiment there, given the gas price dynamics and the wholesale market price dynamics. What has been the deciding factor as to why Ohio and Pennsylvania have gone in one direction while New Jersey, New York and Texas have gone in other directions?

And, just as a quick aside, I feel your pain on Austin, Texas, and the wood pellets. I live in Gainesville, Florida and they have Austin envy. And they've succeeded in becoming Austin Energy in one sense. I pay really high electricity rates, just like Austin customers.

Respondent 1: I've always heard it's better to be lucky than good, so I guess I agree with Speaker 4 on that point. The reality is, natural gas prices were incredibly high in '07 and '08. George Mitchell and others saw a market opportunity, began to work with fracking and horizontal drilling, and, as they say, the rest

is history. Now we have more natural gas in Texas than we've ever had.

That doesn't do you much good unless you have the gas pipeline infrastructure to move gas around, so that goes back to the second pillar, which I talked about earlier, which is market infrastructure. Texas has the infrastructure, the pipelines to move gas quickly and efficiently from source to power station and to customer.

The other thing I would say is that Speaker 4 mentioned that not only were we lucky on gas, but we were lucky on wind. But wind doesn't do any good unless you build transmission to move wind from where it blows to where people live. And we spent \$7 billion plus on CREZ. Customers accepted that. It was a \$4 to \$5 charge on the average bill, but yet the combination of cheap gas and wind has brought customer bills down significantly below \$4.

To answer your first question, to me the defining characteristic of the Texas market is a light regulatory touch. And a lot of this credit can go to Commissioner Anderson. When there was a movement to try to put in place a capacity market mechanism, Ken really stood in the breach to say, you know, we're going to have an energy-only market, and we're going to make it work. When I was on the Commission, one of my colleagues wanted to tinker with the price to beat during that first five-year period, and we voted him down two to one, not because it was a bad idea, but we said, "If we start throwing open the hood and tinkering with this motor, the market is going to expect us to do that every

time there's a problem. So we're not going to. We're going to let the market work it out."

Respondent 2: And I agree with Speaker 4 on this point, you know. Electricity is a political commodity, right? It's different than other commodities. It's a political commodity, right? Because there's a zone of reasonableness in where we can operate. I mean, you know, I'm about delivering efficient, fair and equitable service through market solutions. So, you know, one of the things Texas did differently than other places, and I give Barry Smitherman credit, I give Donna Nelson credit, I give Becky, Paul Hudson, a number of the chairs credit, and, you know, the governor allowed his experts on energy to be experts on energy, and it's that consistency and support of markets and transparency of how the decisions are made that has allowed the Texas retail wholesale experiment to work well. And it is a very challenging industry. Take the anecdote that Speaker 4 shared, where a low-income customer, a vulnerable customer, it looked like it was a mom who was going through some tough times...how do we make sure that family is helped in competition? I don't think that by restricting their choices we're going to help that, but I do think we need to think about what other tools we can have.

But I would say that consistency and transparency in decision making, so people can make plans, can make choices about where they put capital, is important.

And then I do think there's a fundamental question about the role of the retailer versus the role of the distribution company in retail markets that one has to be open to having a

conversation about. CenterPoint, I do view them as a partner. With all due respect to the other discos in the northeast states, I don't necessarily view them as partners. They may not claim to be competitors, but they sell what I sell. So, unless there's something I missed in my econ 101 class, I do think they are a competitor, and I think we have created an environment where they can't succeed as well as they should be able to succeed, and therefore I'm not able to succeed as well as I should be able to succeed. And worse for all of that is that customers lose, and that's just the fact of the matter, because less capital flows through those choices.

Respondent 3: Respondent 2, I really think it is unfair of you to talk about competing with the utility, because you're not competing with the utility. And they are not selling a product that competes with you. The wholesale market supplier is selling a product that you cannot compete with, and it is passed through on the utility bill, the same way your prices are passed through on the utility bill. And so you've got to live with the reality that you can't routinely, and over any reasonable period of time, beat the price for a well-managed default service portfolio. It is not the utility that is your problem. It's wholesale market prices that are your problem.

Respondent 2: OK, but if I'm not competing with the utility that in fact consumers think is selling them electricity, then why do you compare my price to their price?

Respondent 3: When I said "their price," I'm talking about the default service price, which we have to evaluate in this room and confront the reality, which is that it's not the utility's

price. It's not their decision. It is not their power plants. It is a competitively-acquired wholesale market price that you have to beat if you want to sell a product that can truly be provided as a value to the vast number of working class, low-income and middle-income folks in this country.

Question 9: I want to get to a discussion that started earlier in this discussion. I look at where we are today, both in terms of the needs of the system and the technology that is coming, in terms of many more intelligent devices managing buildings, managing electric vehicle charging, and thinking about how we incorporate those kinds of responsive demands in the market, because they are both significant and important in terms of balancing where we are, going forward, and how that plays out in terms of retail competition. And I'm interested in your perspectives on the pathways for making that happen in a much more robust, or as New York REV said at one point, animated way, in a market that can begin to get a much more efficient outcome.

And I say this from the perspective of having been a regulator in that timeframe that Speaker 4 was talking about, and having first of all looked at the data we were getting from our smart meters, realizing that low-income customers tended to have less peak-oriented demands than higher-income customers, having gotten one of our utilities to run a real-time pricing experiment with residential customers, where residential customers had a thermostat with a simple slider between more savings and more comfort. They saved money and had much higher customer satisfaction, because they had control as well

as savings, and those thermostats were bidding into a five-minute real-time pricing market. I think the potential is there, whether it's through some form of block and index pricing or some other way of both giving customers hedges and also engaging the smart devices.

We're working with another client, looking at how you do data analytics on buildings like this. We know that, at the residential level, water heaters, thermostats, other things can provide significant peak demand reductions. How do you begin to engage that through a retail competition structure, and have we, in some way, nudged the market in an ineffective way by doing price-to-beat and, you know, flat hedging to default pricing so that customers don't see value as transparently, don't see bill impacts as transparently, as they might have if we had a much richer form of competition that wasn't so focused on price?

Respondent 1: Well, let me just say that in most states with competition on the books, they are working with their utilities to deliver those programs. When smart meters were installed in Maryland, the Baltimore Gas and Electric Company said, "And now that we have smart meters, let's go to time-of-use rates for everybody, because it's more efficient, people need to see these price signals and we'll reduce usage and lower peak prices." Which is a big deal in Maryland, because of transmission constraints and the PJM market. So, everybody in the consumer world said, "No, no, no, no, no. We're not doing that." So BGE, PEPCO, and the Commission came up with another approach, and that is the carrot

rather than the stick. Let's pay people money who reduce usage during critical peak day hours. We have the smart meter data to know what you've done. We can improve it with a utility-installed smart thermostat that they control, in line with your decision about how much it would be controlled, and we'll pay you, you know, \$1.25 a kilowatt hour (that's how much it was worth when they started the program) to reduce usage during these critical peak days. It's been a significant success, and the economies of scale that a utility can give you, and the ability to bill it, and the ability to sell a product to people in a mass market sense is much more efficient than relying on a whole bunch of retail suppliers, two out of ten of which are interested in that market. The rest of them are all out to make a buck with selling generation supply.

So I've watched these markets, and I know there are a couple people out there offering innovative products, but is the cost that I described worth that? I say not. Others can disagree, but those products are capable of being implemented in the market process that we currently have.

Respondent 2: One of the great disservices we've done as an industry is we've allowed investors and utilities to put smart meters on people's homes and businesses but not provide the data to the retailer in question, which I think we really need to address at some point as an industry. And we really need to start asking that question more fulsomely.

But in Texas we offer a product very similar, as do a lot of my competitors, to reduce your

use. We're also spending hundreds of millions of pounds on a connected home subsidiary hive, which is thinking about how you bring hot water heaters, thermostats, boilers technology, not just to control them, but to ensure that in fact they're operating at the most efficient level possible. So it will happen, but this is the conundrum, right? You can ask your utilities to do that as a monopoly. What they'll ask for is a return on any spend they have, and then they'll go and do their best they can do. Or, you can allow two of ten retailers that really find this valuable to go try to create a market around that. And the question is, will you get more customers that way to go for energy efficiency than having a somewhat willing utility to do it? And, again, it's a question, but there are companies that are trying to do exactly what the questioner is saying. We're trying, but it's hard, in the infrastructure and the mechanism of the market.

Questioner: What, if anything, could we do to nudge that along, is I guess my question?

Respondent 2: It's going on in Texas, so if you had the market design where all customers are engaging, where we're sending the bill, where we're having those robust conversations, where we're creating bills that allow customers to be engaged...I mean, you know, why do customers not engage with our electricity bill? Because they have no control. If you have no control, why would you spend more than enough time to send the bill? It's only control if it's going to make you want to engage. Consumers in Texas do engage with their bill. They do look. I mean, we know. We see who goes onto our website to see how their appliances are, which appliance is

spending the most money. I'm happy to bring those same solutions, if I have the infrastructure of a meter that allows me to get real data quickly. If I don't, it's hard to do it.

Question 10: It seems to me that part of the issue we're all dealing with that underlies our discussions is, as you said, the somewhat unwilling utility meets the somewhat unwilling customer who now is faced with retail competition. I'm not sure residential customers ever wanted competition. I know industrials did, and they pushed the re-regulation. And maybe we should've just given them wheeling and not gone through all this.

I also value the innovation that market entrants bring that utilities do not bring, because they don't have an interest in bringing it. And the best example that comes immediately to mind is demand response. Utilities were totally unwilling, except for some of their in-house programs with smart meters. Recently, Nevada had a referendum on competition, and it overwhelmingly passed that the state wanted competition. And I was invited to talk to their advisory board, which was trying to figure out what they were going to do with that. And I said, "You don't understand," you know. You go back to the idea that correlation does not imply causation. No one likes their utility, frankly, and so, if there's a referendum on their utility, and there's another choice, guess what's going to happen. They're going to say, "Anything but that utility." And when I talked to them about the shopping rates in some of the competition states, they said, "Well, how can we improve that? That's a really low shopping rate." And I said, "I'm

not sure you can, and I'm not sure you need to. Maybe that's all you'll ever get."

But, you know, I think, when you bring those two forces together, the customer that's forced to make a choice who probably really doesn't want to make a choice, and the utility which is really unwilling to meet the customer's needs and be innovative, you get things like smart meters. I have three smart meters at my house. Three. One for the gas company, one for the electric company, one for the water company. What is that about? I mean, where are we? We've lost our minds, and I think we need to interpret the shopping choices that customers are making in light of the question of whether they ever really wanted to shop, and the utility choices in terms of, were they ever willing to have competition?

And we know what that answer is, because then you get results like in West Virginia, where we have an energy efficiency program. Customers pay for it. They also pay for the utilities' lost revenues as a result of the program. You know, that makes no sense, so how do you see all this coming together in a more meaningful way?

Moderator: Thank you, I apologize to all. No more questions. We have a 12:00 o'clock deadline for lunch.

Session Two.

Order 1000: Looking Back/Looking Forward

In 2011, FERC issued its landmark Order 1000 “...that reforms the Commission’s electric transmission planning and cost allocation requirements for public utility transmission providers.” The rule covered many areas of transmission planning, coordination, and cost allocation. The challenges addressed are among the most difficult in the interconnected and interdependent transmission grid. The accumulating experience highlights many issues that include core requirements such as beneficiary-pays cost allocation and broader matters that relate to possibly conflicting state policies and questions about jurisdictional responsibilities. How are we doing in implementing the broad principles? What are the most important achievements of the original order? How much remains undecided or still in flux in the implementation? What modifications or improvements might follow from the accumulating experience? How does the changing nature of the electricity system, especially with the growth of intermittent resources, affect the policies embedded in the FERC mandates?

Speaker 1.

Thank you. Since I’m first up, I prepared these slides thinking about that. One of the important concepts to get a hold of is that there was this old utility model for transmission expansion which we usually called Integrated Resource Planning. And it was a lot easier than what we do today, because the vertically integrated utility would forecast load, decide where and when they wanted to build a generator, and then they would get state approval and figure out how much transmission they needed to get it to their forecasted load. The cost went into rate base. They were about 10 percent of utility rates, and nobody cared a lot about them. And if it crossed utility lines, there would just usually be a bilateral negotiation.

The Energy Policy Act, in 2005, which I went back and read parts of, because it’s a very long and detailed piece of legislation, is very interesting. I mean, it charges FERC with promoting “reliable and economically efficient transmission and generation.” As an economist, I often question whether or not the idea of being economically efficient includes reliability. I can’t argue, internally, that you can be economically efficient without be reliable. The Policy Act

encouraged us to provide incentives to attract new transmission investment. It has a long list of advanced technologies, and there’s actually, as you’ll see in a second, a catchall that includes everything you can possibly imagine. There was limited eminent domain authority given to the Commission, which was essentially taking away by a Fourth Circuit decision, and I think the current interpretation is that FERC doesn’t have any eminent domain authority in transmission to speak of.

Here’s a list of the advanced transmission technologies in EAct 2005. If you look through the list you’ll find controllable load, and then, if you don’t find yourself in any of the other items, it includes any other technology the Commission likes.

About a month ago, the House Energy and Commerce Subcommittee held a hearing. It was mostly negative about Order 1000, and the Commission Chairman said that our agency’s planning process is ripe for review.

Now, when you go from the vertically integrated utility to the ISO, life gets a lot more complicated, and to some extent I think this may be the most

complicated task that the ISO actually performs. You first of all have to model the region, which usually consists of multiple utilities. At least initially, it was very difficult to model multiple utilities, because their data didn't agree, and it was difficult to find a feasible solution. Then you have to anticipate where the generation will locate. And then you have to build transmission to optimally bring that generation to market. And, as the Energy Policy Act implores us to do, then you find the efficient mix of generation and transmission, which turns out to be a very difficult problem in many dimensions.

We also have an interconnection process, which is transmission, essentially, by another name, where the generators pay for the services, and the generators, in that process, can pay to upgrade the transmission system. But in the transmission planning part of the transmission planning process, the consumers pay, and they pay roughly according to the benefits they receive. This is a different process, but it is operated by a lot of the people who operated under the original process, because they're still around.

In the various regions, you find different people, or different entities, with different objectives. As we saw earlier, EPAct has an objective of maximizing economic efficiency. Some transmission planning processes have a minimized regret objective, assuming that you don't want to build a transmission line to nowhere. (If you build it, will they come?) Also, there is an emphasis on fixing "reliability" problems, but, like I said, I can't distinguish reliability problems from efficiency problems. Also, there's a problem with transparency. There is so much data and modeling that takes place in this process that it's very hard for people to understand what's happening. And, to a certain extent, we don't coordinate the interconnection process with the transmission process, which I think may be something we should re-look at.

The uncertainties have changed. Before, the uncertainties were basically the probability of a

generator going down, or a transmission line going down. Now, the uncertainties involve how much wind you're going to get and how much solar you're going to get and how much you can forecast into the future, and that essentially changes the way you have to do the modeling to figure out which transmission lines to build.

These models have become very large, very complex, and very data intensive. And, as a result, oftentimes we do a lot of simplifications and assumptions to make the process easier and more manageable. Some models are better to answer certain questions. For example, large models may be able to answer very difficult questions, but they're often very hard to understand. Small models may be very easy to understand, and may be transparent, but they may be terribly oversimplified, and oftentimes the small models have a transmission system that consists of what people call the "pipeline" model, which doesn't consider the alternating current load flow of the transmission system. And the high resolution models have a lot of computation.

Early on in this process, there was a contract let to do a model of the Eastern Interconnect, and the model developers came back and said, "The Eastern Interconnect is infeasible." [LAUGHTER] Which reminds me of the old saying that what works in practice doesn't work in theory. [LAUGHTER] But in this case, it was probably a data problem, and for the complicated models, the model has to come with an expert to handle and massage and testify about what the model is doing.

This slide is just a small list of capacity expansion models. There's been a lot of work done in the last decade on capacity expansion models. Every one of these has a website with a description of how wonderful they are, how they use state of the art this and state of the art that and the best data available. I'm not sure, I guess that's trade buffing, but there has been a lot of improvement in these models. Even PROMOD is a little bit better than it was 25 years ago. PROMOD

probably is still the dominate model that people use.

As I said before, you have to think about what the optimal technology of the future is, and you have to start with base cases, and then you have to choose representative time periods, and, importantly, you have to capture the stochastic nature of these markets and the flexibility needs, otherwise you're going to get an answer that doesn't make a lot of sense.

Turning to cost allocation, that's always a difficult problem. A Seventh Circuit decision lectured FERC on how it should do cost allocation, and I recommend the oral arguments in the case. The judge was Judge Posner. It seemed that most of the people in the oral arguments didn't realize who Judge Posner was, [LAUGHTER] and that he had written extensively on cost allocation. But I recommend it as a very fascinating oral argument to read.

And not everyone in a transmission expansion is a beneficiary. There can be losers, and the question becomes, should they be compensated? That's a policy question. In theory, if you have found an efficient transmission expansion, the winners can compensate the losers, but I haven't seen that happening. And this is not like competition, where the losers just can't compete. These are planned facilities.

The easy thing about this is the cost allocation. No matter how you've done these difficult processes, in the end, finding the beneficiaries, if you buy into all this stuff that went before this, is a relatively simple, and I do emphasize *relatively* simple, process.

For example, let's look at a two bus system and look at adding new capacity. So, this is the existing system, and we're going to propose to expand. This is the export bus, and it's the supply curve, essentially, for exports.

So, you expand the system, and what you do is you move up the export supply curve, and you move down the import supply curve. Now, it's very obvious that the consumers at Node Two benefit from this expansion, because the price goes down. But, at least in this simple example, when the consumers benefit from the prices going down, the producers don't. And also, at Node One, the consumers don't benefit. As a matter of fact, they probably dis-benefit, and the prices go up. And, conversely, the generators are happy because the prices have gone up.

And, although this is a simple example, we can easily implement this if we have the results of the transmission planning process, and if we got it right. Because the transmission plan requires that you find efficient transmission where the costs exceed the benefits, and if you do that right, you can implement this with relative ease, and you can calculate the benefits.

There's a discussion in Posner's decision about the principle of beneficiaries pay, although they got bogged down in an argument about whether or not the people who were complaining about the cost allocation actually asked for the data from the transmission studies, and apparently the entities said, "Well, we didn't ask for the data, but we asked for a hearing," and then we were going to ask for the data, and that took up a huge amount of the oral argument. So, with that I'll quit.

Speaker 2.

Those of you who've been around for a while will have noticed that Bill choses one person for almost every panel to tell you why competition doesn't work in a particular situation. I think he knows he's throwing that person to the lions. I am your afternoon meal. [LAUGHTER]

So, let me go through and figure this out. I represent transmission developers. And my baseline message for all of you is that this is really, really hard to do. I have seen many, many projects that are undeniably beneficial, for a variety of reasons, not make it through. I've seen

hundreds of millions of dollars of development money down the tubes. One merchant developer I represent is an industry veteran. Another is an energy equity investor. And the industry veteran, at the end, after they spent about \$60 million, said, “You have to be insane to want to build transmission in this country.” The equity investor said, “I’ve learned one thing from this project. I will never invest in transmission again.”

So, this is really hard to do. A lot of money gets spent upfront, and so my lens is, anything that makes it harder to get transmission built, I’m very skeptical about. I want to figure out how we can get it built. That’s just my bias. I’ve seen too many projects go down the tubes.

I also think that as a result of the policies we have in place, something is happening quietly, and that is, instead of investing in larger projects that require siting and going through RTO processes and the like, utilities are investing in smaller, local projects. They’re spending their money just fixing up their internal systems, at a lower voltage level. And I don’t know that that’s being driven by best upgrade decisions, but by decisions about where they ought to put their money given the risks associated with trying to build transmission. That’s anecdotal, but as someone that is in the business, I think that’s what’s occurring.

Another point I would make is that we’re now entering an era where everything that’s done to the grid now is going to have to be debated against distributed alternatives. And I think all of this is going to get much harder as we go forward, because some people will take the position that we shouldn’t be investing in the grid, we should be investing in the distribution system and micro grids and more storage, *et cetera*. And I don’t want to demean those arguments. I’m just saying that that will make this all very harder.

So, what was FERC trying to accomplish in Order 1000? Well, first, it wanted promote consideration of cost-based transmission options other than those proposed by incumbent utilities.

And I can’t disagree with that. There are some utilities that own generation that might have an incentive not to come forward with the best projects. They might want to be feathering their nests with projects that are excessive. And, as Speaker 1 pointed out, you can build transmission and increase costs in a region. So, that was certainly a positive intention. They wanted to select the most cost efficient, cost-based alternative that would resolve the identified transmission need. That makes perfect sense to me. Let’s figure out which is the best way to solve this solution in the planning process. I have no problem with that. (By the way, Speaker 1, I do take issue with your comment that there really isn’t a difference between reliability and economic projects. The problem with your analysis is that your agency, at the direction of Congress has approved reliability standards that are mandatory, and there are some that apply to the transmission system. And so, it isn’t always the case that we’re building for economics, unfortunately. Whether we should be is an interesting conversation.)

I would also say that a third category of projects has emerged which in New England we call “public policy” projects. And those are a transmission project used to bring in renewables from remote locations that may not make economic sense--of course, without considering externalities--so it’s actually a lot more complicated than just figuring out the lowest cost.

Next, FERC is trying to force transmission developers, whoever builds, to sharpen their knives, so, we don’t get gold plated projects.

Moderator: Their pencils or their knives?

Speaker 2: Both. I think this is both good and bad. The lowest cost is not necessarily the best. We want transmission that’s going to last 40 or 50 years, and there are a few instances out there of people building lines that came down in the first windstorm, and the like. And so, what we need to be careful is that, while this is correct, we

shouldn't have too much of a focus on cost over the reliable construction of the project. And that's hard. That's not an easy thing to analyze.

So, what's the problem? With the Order 1000 process, we've gone through years and years of implementation plans. The processes are unworkable. They create endless delays. And they just make transmission development much more expensive and difficult. I think that what FERC has put in place invites gaming behavior and may not produce optimal solutions. And I also think it Balkanizes responsibility for operating the grid, and I think that's an under-recognized problem, which I'll talk about again later. So, I think the problems with the way FERC's done it outweigh the benefits. I admit the benefits, but I think FERC might have done better if it had focused on improvements in the planning process, including those that might have tried to bring in some competition around the edges.

The first thing FERC had to do was figure out whether it had jurisdiction. The Federal Power Act doesn't give FERC jurisdiction over transmission planning. It's been traditionally a state function, as part of Integrated Resource Planning. And the Federal Power Act, as Speaker 1 pointed out, other than backstop authority...and, by the way, I wish the Fourth Circuit decision, which was wrong, would have been challenged, but you're right about where the law is today. Fourth Circuit decisions do not have national effect, however. Only in the Fourth Circuit is that the law, I would also point out. But siting has also been a traditional State function.

So, what is FERC's role? FERC very cleverly (and they've got some really smart people there) said, "This isn't about planning and siting. We're not interfering with the states. We're approving cost allocations. So, we're determining who pays for the lines. And, of course, you, state, you can permit anything you want, and you can do your siting, but unless we've approved a project and approved cost recovery for the project, you aren't getting anywhere." And so the states now just fail

to site FERC-approved projects, and we've got a standoff jurisdictionally and there are many of those under the Power Act, as you all know.

So, what would be the minimum requirement for an Order 1000 planning process? Well, first, something that has to happen is that somebody has to identify whether there's a need for transmission for reliability, economic or public policy purposes. And the RTOs have that responsibility, and they try to use the expertise within the RTO to help them make that determination. Then they have to evaluate the qualifications of bidders, and that's important. Just because some equity investor who gets together with a retired planner thinks he wants to build a project, that doesn't mean they have either the technical or financial capability to plan, design, license, manage construction, and operate and maintain that project. So, you have to have qualifications for bidders. Then you have to have rules for submitting the proposal, and those get very, very complicated. And then, once you've decided how the proposals come in, eventually you get to an RTO evaluation of proposals, and, of course, they have to have some record of decision, because this is all going to FERC, and FERC, with its expertise in the construction and design of transmission lines, is going to review that decision. And you have RTO internal reviews at the management level. In other words, this starts with staff making recommendations, and then you have people, many of whom don't know anything about building transmission, who are the Board members, and they ultimately have to approve the project.

So, you appeal the RTO decisions to FERC, and then, of course, you have the rehearing process, and you FERC experts know that it's something like 21 years before you get a hearing. [LAUGHTER] And then you get it remanded back to the RTO, and you have the Court of Appeals in there, and, really, you have disputes at every stage of this process and it just is endless and tremendously expensive. And for the people I've represented, they just threw up their hands.

They have no choice. They're in it. It's not the way to do things.

And so, drilling down a little bit, who decides? One of the things that's gone on here is that the RTOs have been converted into transmission judges. And this demands expertise in planning, which I think they developed, as well as in engineering, construction and finance. Well, they don't have any expertise in all those things. And they weren't formed for this purpose, and let me make one thing clear. The RTOs could not have been clearer to FERC when Order 1000 came out. "We don't want this job. Don't give it to us." But they've got it. And it's not just about planning, at this point. You really have to understand which proposals are real. You have to evaluate cost caps. We'll get into that. This is a very complicated thing. It's also very expensive, and it's become an important function. RTO budgets were already being challenged substantially. This is just making those budgets larger and the cost of RTOs even higher, which is one of the reasons why the RTOs didn't want it. And, finally, FERC has to review these decisions.

Look, I have a lot of respect for FERC. I really do. I've spent 40 years in front of that agency. But I was just in an investigation that involved early transmission planning issues. And I have to tell you, the planners at FERC were just not anywhere near the level of the industry planners who were involved. We were teaching them along the way. They were nice people. They had some expertise. They knew how to run the models, but when it came down to the nitty gritty, they just weren't of the same caliber. There's no expertise on engineering construction. There's some expertise on finance there, but I'm not sure, really, that FERC could stand up and raise its right hand and say it really has the expertise to review these things.

Who's eligible to bid? Most Order 1000 implementation plans pay lip service to requiring technical expertise and financial capability. But, boy, turning that into a concrete requirement and

trying to review it and then weigh that against other aspects of a bid to decide even if someone's qualified is a very hard thing to do.

There's also this problem: if the line goes out and it affects service, I think I know who's going to get blamed. It's going to be the incumbent utility, and perhaps a state regulator. That's who's going to get blamed. This guy from the other side of the country who came in and built a line and doesn't have any local crews and really doesn't have the capability to manage the line in real time is not going to get blamed. But if you're going to have a transmission grid that's going to have multiple ownership within a single area, someone needs to think through the process of making sure all those transmission lines are operated and maintained, and that, if they go down, there really are people available to fix them. Because the truth is, only the incumbent utilities have the transmission crews available locally. They can be purchased from neighboring utilities, for sure.

Now we go to how winners are selected. So, now RTOs have to weigh the efficacy of the proposal to resolve the need. They have to weigh short term versus long term and narrow versus broad fixes. It's very easy to say, "I've got the lowest-cost fix," but the correct fix may be something that's more expensive that fixes two or three or five problems and also sees an emerging problem coming and is much more robust from the standpoint of a reliable grid--what a good engineer would say is the best solution. So, the RTOs have to figure that out. They have to forecast the cost of the competing proposals, and they have to evaluate the reliability of the estimates. They have to look at the quality of cost caps and that's a gaming opportunity I'll talk about later. They have to look at the stage of project development. How real is this? How good are the cost estimates? There's the capability of the developer, the likelihood of permitting...and all of these have to be weighed one way or another, and then the RTO has to make a decision. Well, good luck.

And, of course, somebody has to pay for all of this, and in most cases it's the consumer. Let me give you a few examples. Let's say the RTO identifies an emerging reliability problem. Bidder A presents a narrowly-tailored proposal to address the problem with a \$100 million cost estimate planning level study. Bidder B has a broader proposal that fixes the problem and resolves emerging long-term problems, but it costs \$200 million. And then the incumbent (by the way, in most of these processes, the incumbent is required to submit their own bid as a backstop in case nobody else gets picked) comes in and it says, "OK, I can do the narrow proposal, but it's going to cost \$150 million, and I can do the broad proposal, but it's going to cost \$300 million, and, by the way, these two costs estimates you got from A and B, they're full of crap. They don't know what they're doing. I've built here. I know how to build on my system, thank you. This is what it's going to cost." Well, how does the RTO weigh these three proposals? Which one does it pick? How much does the RTO weigh local knowledge? How about the level of analyses that came in at the planning stage? It's hard. And the reality is that the RTO is going to be under a lot of pressure to pick the lowest cost bid in every case. It's just reality that to ask an RTO to reject the lower cost bid because another one may solve some down the road problem or be more robust is a really hard ask.

Example two. Bidder A proposes a \$300 million fix with a hard cost cap. Cost caps have become all the rage, by the way, so we use cost caps now, which is a gaming opportunity that I'll discuss. Bidder B proposes the same fix at \$275 million with a soft cost cap. So, it's a cap, but if A, B, C, or D happens I can exceed it, and then the incumbent says, "No, I'll do it for \$250 million, but I'm not going to give you any cost cap." Which of these projects do you want to build? I mean, how good are the caps? Are they reliable? You're going to pay more. How much more are you going to pay for the cap? It's very hard. And the estimates may or may not be backed by the same level of analysis. Besides which, cost caps

aren't the whole game. What about the cost of capital? Project A comes in and he says, "I'm going to use 20 percent equity and 80 percent debt. I'm going to leverage this baby up." The utility says. "There's a reason why I have a 50/50 capital structure, and that's because you want me around for the next 40 years. That's why we have equity in our capital structure." So, how do you weigh that in? And now, is the RTO getting into FERC rate making? FERC has been very uncomfortable, saying that, "Well, when we approve these things, the RTO is going to approve the rate making." So, that's another problem that we have.

Example three, getting to the cost cap issue. Developer a gets its project accepted based on a bid that includes the hard cap, or a soft cap with very limited exposures. Developer A gets halfway through the project, and it determines it won't be able to complete the project under the cap. So, the RTO says, "Sorry, you're stuck with the cap. That's how you won the project." So, A appeals to FERC, and he threatens to walk away from the project: "This happened, that happened, da, da, da. I'm going to go bankrupt." It's probably a single purpose vehicle, right? So, that's it. Now what happens? Does FERC enforce the cap? If they do, doesn't the developer just walk away and leave the utility to finish it? And if the developer walks away, does he get all the money he spent, plus a return on that money? Or, does FERC say, "No, you get zero dollars. You're out of here?" And this is the kind of stuff that is likely and is going on. One possibility is that the RTO, God forbid, starts another Order 1000 competitive process. Can you imagine starting over? Well, we'll get there in a minute. [LAUGHTER] We actually do.

So, we've got a real problem. We also have a problem implementing the soft caps. If I say, "I'm capped except for A, B, C and D," well, now someone has to evaluate whether or not A, B, C or D has actually occurred, and that's the reason for the cap. Good luck.

So, Artificial Island. I hate Artificial Island. And I was not involved in Artificial Island, and the reason is, I had two clients bidding into the project. And it's a good lesson for lawyers. One client in a dispute--great. Two clients in a dispute, it's the worst thing in the world. OK. So, I was out. Not involved. I'm looking at this from the outside, although obviously you'll see I have a bias.

So, we had a discrete, localized problem. We had a reliability problem getting energy out of the nuclear plants, Hope Creek and Salem, right? It's a very narrow project. It took four years to choose the winning bidder. And now it's taking four more years to build. So, from my perspective, that's a loser. I don't care about the details. But it turns out PJM picked the winning bidder, and then there was political pressure, and the PJM board changed its mind, and they started over. And there was a new needs assessment done, and then the winning bidder actually didn't have its proposal selected, because it wanted to build in the more expensive substation. So, the RTO took a portion of another bidder's proposal and mixed them together, and gave it to the winning bidder. And there are still debates about whether or not we have the most robust solution or even the lowest-cost proposal. We have a soft cap. Whether or not that will have to be exercised, we don't know. And so, the argument is, is this just growing pains, or is this evidence that the process doesn't work? And maybe it's growing pains. It was the first time PJM had to do it, but this was not a complicated project, and it just really turned out to be almost impossible.

Cost allocation. Posner thinks he's very smart. But Cudahy, who wrote the dissent, was right. It's really hard to identify beneficiaries, and there's a reason why this industry spreads costs. Maybe they shouldn't have been spread the way they were, but Posner wasn't the smartest guy in the room. Cudahy, he was smarter. In fact, when it was sent back to FERC, they had two years of litigation. They couldn't decide how to do a beneficiary-pays analysis for the project. So, they

ended up settling it, and they settled in on some spreading methodology. It went back to Posner, and he said, "You didn't do what I said," and sent it back down to FERC.

So, I'm sorry. Come to me with a robust, repeatable, concrete, reasonably objective methodology for determining beneficiaries and allocating costs. I'm with you. But I'm not interested in three or four years of litigation on every project. So, we spread the costs.

The suggestion's been made that this cost allocation should be done in connection with the review of the project itself, because that's when you're supposed to be determining beneficiaries. What I wrote here on that is, "Abandon hope, all ye who enter here." I don't think that's the right way to go.

So, what has happened? We get lower voltage projects assigned locally. We get medium voltage projects assigned partially locally, partially spread across the region. The highest voltage backbone projects generally get spread. In New England, we have gold plating exceptions. If the local people throw something in that increases the cost for their own reasons, that's local. And, by the way, nobody's allocating anything to generators or to local communities that benefit from new generation coming in. It's all going to load, for the most part.

I've come in here with what I think is a well-designed way to do planning and some potential enhancements that FERC could try, to try and introduce competition, but good luck.

Speaker 3.

Good afternoon. I know you probably don't hear from state authorized consumer advocates all that often, but it's always wise to involve them earlier, rather than later, especially if you're in PJM. Because the consumer advocates have a very organized group, and if you know that they have FERC tariff funding for the consumer advocates comparable to what OPSI (the Organization of

PJM States, Inc.) has, you'll know that consumer advocates had to be quite organized and effective or we never would have gotten 82 percent of the stakeholder vote to be funded.

And I would also say that hearing from commissions whose job it is to look out for all customers, including the utilities and sometimes the economic interests of the state, is not the same as hearing from consumer advocates. So, I encourage you to maybe even try to get some consumer advocate participants, but to have them around a little more often, because you're going to run into us one way or another.

My comments will be PJM-centric. I've been working on transmission issues at PJM for years. And we're finally beginning to see some movement there.

I want to look back and think about when RTOs and ISOs were created for transmission planning, and what the reaction of the transmission owners was. The reaction wasn't good. No utility wants to cede control of any aspect of its assets or operations. We all know that. It's just something you can't get around. And so, when FERC said, "Look, we're going to have this planning process, and you're going to participate in it, and for reliability purposes, and sometimes economic purposes, we're going to tell you what you can do and what you can't do through the planning process," that was a scary thing. And I remember, when that happened, the big question was, was anyone going to build transmission? Was this going to scare everyone away, so that transmission just wasn't built? And I think FERC was faced with a situation where it, and the RTOs, also, wanted to reassure the transmission owners that it was OK to build transmission. They weren't going to be harmed by that. And so, we have this system where the RTO (PJM, for example) identifies a problem, and the transmission owners come in and propose solutions. I don't know how well those proposals were evaluated. I have no facts upon which to base my speculation. But my speculation is that

they weren't reviewed very carefully by PJM, and that they still aren't. To wit, just recently, in a planning meeting, the maps describing the transmission projects were completely incorrect. And how it went through the PJM planning and review and evaluation process to get to the stakeholder process and be so clearly wrong, is something that we all need to think about.

Now, I'm not saying PJM is not able to do this. Those of you that know me know that I think very highly of PJM and its staff. But in the early days, when we wanted to incent those transmission projects, I envisioned PJM saying, "Oh, you know, this is great, sure, yeah. This fits the bill. We don't have to look at it terribly carefully." And I think that was the state of things, until merchant transmission became more present at PJM.

On the cost allocation issue, of course the beneficiaries should pay, but how do you measure that? The whole process is like making sausage, and that's just one little element of the process. How do you determine who the beneficiary is? And I'm not even going to talk about that. But, from FERC's perspective (and, once again, I have absolutely no facts upon which to base this speculation) I don't think FERC was in a position, when the Maryland rate caps came off, and in other states, to then say, "The East, which is so highly congested, is clearly the beneficiary, and your rates are going up geometrically from what they've already done. It just was politically untenable. There had to be some socialization of transmission costs. And I know, at PJM, that was negotiated with the transmission owners and PJM and went through the stakeholder process, and there's a mix of socialization and trying to have beneficiaries pay. At the time when Order 1000 first came out, being in western PJM, that seemed to be a pretty good place to be, because we didn't have the congestion. But that also has changed.

I think FERC also worked very hard to incent transmission, just like I believe PJM tried to make it easy for transmission owners to work with them

and get their transmission built. And we saw that in the higher ROEs--the RTO bonus, which is a mystery to me. Even today, transmission builders are getting a bonus for being in an RTO. I find that quite interesting.

Speaker 2: Too low.

Speaker 3: Too low. [LAUGHTER] 50 basis points. The transmission owners have expedited cost recovery, and, as was pointed out earlier, there's this really interesting thing that's happening now between RTEP (Regional Transmission Expansion Plan) projects, reliability projects, and Supplemental Projects, which are the state projects. And, as we see, the need at PJM for reliability projects is declining. We see the State Supplemental Projects increasing dramatically. Now, why is this? Is it because we've done a lot of build-out of the PJM system? Is it because no one's building transmission? Or, is it because, like AEP and FirstEnergy announced, they're using transmission build to drive their earnings? Where else can they get a 14 percent return on equity and near real time repayment of their transmission cost? So, that's a pretty good investment. And both AEP and FirstEnergy, in their earnings calls, have identified this as driving their earnings, and it's very important to both of them.

So, there are some disconnects between the PJM projects and the state projects. I was in a case recently, and the only two electric utilities in West Virginia are AEP and FirstEnergy, where a project was brought in, and I was told that this was a PJM project. And I thought, "Hurray. This isn't something I have to do a deep dive into. It's been vetted. It's been approved. It's a reliability project. I can stand down on this with my huge staff of two attorneys and two analysts, and my consulting budget, every year, of \$186,000." I was happy, until I found out it was a Supplemental Project. Now, supplemental projects are reported to PJM, and PJM includes them in their RTEP, just so they know what projects are out there, but it was not a reliability

project, as we were led to believe. And this is a real problem. It's being addressed now, but states commissions did not know what project was what, and when you have the number of RTEP projects going down and the number of supplemental projects going up, you have a big issue to look at, in terms of the impacts on the customers.

Does it mean that transmission isn't being built? Well, no. Transmission is being built. If you look at the top 20 electric utility holding companies, there's a steady increase in transmission spend. In 2016, it was up 13.1 percent over the year before. It was \$18.1 billion higher than both distribution and production spend. So, where we had transmission being 10 percent earlier, now it's about 30 percent.

Speaker 2: That's not right.

Speaker 3: Well, it's from the EIA. It's from FERC Form 1. I can show you the study.

So, who's leading these expenditures? Well, AEP and FirstEnergy. The two that hit my state the hardest. So, we have two of the four largest spenders in transmission build. The transmission spend has been steadily increasing over the last five years, and there's no expectation that that is going to stop--and by transmission spend, I mean both PJM projects and Supplemental Projects. One of the things we're seeing in PJM is that, as our generation and distribution builds begin to decline, our rates to customers are still increasing dramatically as a result of the transmission spend.

So, I say to you, you can talk about cost allocation. That's what this panel is about. What's on the horizon, and what has to be addressed, is competition in transmission. Because if you think that state commissions and consumer advocates are going to allow the high returns on transmission builds that the Supplemental Projects are getting, you're wrong. It just isn't going to happen, and this has been a big fight at PJM. When PJM says, "Oh, but we

don't know how to evaluate cost caps, and how would we do that?" of course they know how to do that. It's PJM. They have some of the smartest people in the room, but they didn't want to do it.

I raised six kids. I'm clear when people don't want to do something. They didn't want to do it, so two years have been spent developing templates and formulas that PJM could adapt and use in making these evaluations.

So, there should be competition in transmission. I know it's an arduous process. Let's face it. There's only a handful of companies that build transmission. The utilities don't build transmission. They hire people to build transmission. And the merchants hire the same people to build the transmission. There should be cost caps, and they should be evaluated in the RTO process. And, even more important, the capital for building transmission should be competitive as well. There is no reason we shouldn't take advantage of the capital markets worldwide. There's no reason. There's no reason we, A, have to continue to incent transmission at a 14 percent ROE or, B, can't take the benefit of lower capital. And that's something that's, I know, very scandalous to say, and no one wants to hear it, but PJM runs markets for energy and capacity. As the executive director of the state commission organization, OPSI said, can't you figure out how to run transmission competitively? You do it for generation, and you do it for capacity.

So, this is the herd of buffalo coming over the horizon. And if we don't start talking about it now, and find solutions to it, there's going to be a huge standoff between consumers and transmission owners and builders and merchant transmission owners and builders. And my view is, if I'm paying for it, as a representative of consumers, I want it my way. And if it takes PJM to redo their planning process...They say, "Oh our window is too discrete. We can't possibly evaluate all these things in our discrete planning

window." Change the planning window. It obviously doesn't work.

But there's really a lot of resistance to making competition work. The transmission owners don't want to make it work, and PJM is very reticent about making it work.

Now, I don't mean to diminish all of the amazing work PJM does, or what the incumbent transmission owners bring to the table, but it's time for things to change, just like they did with energy and capacity markets, and I hope to see that in my lifetime. It usually takes years. So, I think that kind of gets me through my presentation. The high earnings that are embedded into transmission costs aren't costs that consumers are any longer willing to pay. And we really need to revisit this. Thank you.

Speaker 4.

Thank you so much for the opportunity to provide a few comments and perspective on Order 1000. As I've been listening to the different panelists provide their perspectives, all sorts of things have been going through my mind, in terms of the history with the Order 1000, and where we've been, and where we're going in the future.

You can think about the history of Order 1000 in terms of chapters. It took several years to develop the policy and for it to be finalized at FERC and to go through that process and for the compliance filings to be in place across the country. And then phase two was the court process and the appellate process. And nine years later, the courts have upheld Order 1000, whether or not it's the policy of Order 1000. In the DC Circuit, they also upheld the compliance filings for PJM, for SPP, for ISO New England. The 7th Circuit in Chicago upheld the MISO compliance filing, and then the Supreme Court denied review.

So, we've been through a lot of policy formation with Order 1000, and we've been through the Appellate process with Order 1000, and the courts have upheld it, and they've upheld the

notion of competition in transmission. And so, my company believes that competition in transmission is on solid legal ground.

We also recognize, though, that there's been a lot of criticism of Order 1000. And my company would respond to the criticism by saying that we think, from an overarching standpoint, that the challenges with Order 1000, and what's happened across the country, are not the result of the policy of competition itself. From our view, the challenge with Order 1000 is not the fact that Order 1000 exists. The challenge with Order 1000 is actually in the carve outs to Order 1000--the carve outs to competition in the compliance filings.

When FERC issued Order 1000, they said, "This is a policy of competition." And it's a national policy. It was upheld by the DC Circuit, and the RTOs across the country all followed suit and implemented compliance filings. There were a number of very robust carve outs that occurred doing the compliance filing process. And so, in response to some of the criticism that people give about Order 1000, saying, "Oh, it's not working," we would say, "No, the policy of Order 1000 is just fine." Competition is just fine as a policy. The challenge is that FERC, when the compliance filings came in, gave too many carve outs, and so we're not seeing as robust competition as we could have. And that, in our view, is the challenge: fixing those carve outs and fixing the compliance filings.

Before I get into the details of the presentation, the other main point, in terms of kind of where I'm going with the comments, is that as we look ahead, in terms of where's the policy going on Order 1000, we think that the discussions that are occurring in PJM right now, the discussions that are starting to occur in New York, in NYISO, relating to cost containment policy and cost cap policy, are very important.

And the reason that the courts unanimously upheld the policy of competition in transmission

was because the courts upheld the notion of the potential for consumer benefits associated with transmission competition. Now the burden is on the RTO processes and FERC to essentially put together the appropriate frameworks for picking the winners and losers that help bring the benefits to the consumers.

And then, lastly, the discussions that are ongoing at the states are very important to Order 1000. And part of the challenge that we've had with implementing Order 1000 is that, after Order 1000 passed, a number of states, generally driven by the incumbent utilities in the states, passed what's called a state Right of First Refusal (ROFR) law for their states, and essentially opted out, for their particular state, from these competitive processes. And in the State of Minnesota, a challenge was filed last September, the first such challenge of the State Right of First Refusal Law, to overturn it, on the basis that it was inconsistent with the Dormant Commerce Clause, and unconstitutional. And several months ago, the Department of Justice weighed in on that case, saying that they concurred with the Plaintiff, which was my company, saying that the State Right of First Refusal law is unconstitutional and inconsistent with the Dormant Commerce Clause, and upholding the notion that some of these restrictions that have been put into place, in our view, are on weak legal ground. And we see, as a key trend ahead, working through these issues on some of these state ROFR laws and whether they are actually constitutional.

So, with that background, I would say that if we look at the report card for Order 1000 right now, you will see that the world of competitive transmission is pretty limited. So, this chart basically shows transmission approved recently by some of the key RTOs: PJM, MISO, SPP and California ISO, and this is total approved transmission. And the blue part of the bars is what hasn't gone out for bid. And the orange part of the bars is what's competitive. And if you look at this chart, it basically shows that you have market

leaders in competition, that are in California and in PJM, and you have a little bit of competitive transmission in MISO. And in terms of an update on this chart, there's a significant amount of activity actually going on in New York with Order 1000, and we think some positive developments that are occurring from a New York perspective as well. But, basically, the world of Order 1000 competition is fairly limited.

That's a criticism, and we would say the answer to addressing some of these issues is that we have to get rid of some of the carve outs from competition. And then, at the same time, what we clearly see in these competitive bid processes is that when there are the limited opportunities for competition, what's happening across the country, in literally every single competitive bid process for Order 1000, is that the marketplace is responding with cost containment bids and cost caps--whether or not that bid is in California, or in SPP, or in MISO, or in New York, or in PJM, you have market participants responding with binding cost containment, basically shifting the risk from the rate payers to the developers on the cost of the transmission. You have developers bidding in ROE caps. You have developers bidding in, and waving various incentives that they would otherwise file at FERC. You have some developers in California bidding in O&M caps associated with their substations.

And so, from a marketplace perspective, big picture, you're not seeing as many competitive windows as what my company would say that there should be. But when you are seeing those competitive windows, you're seeing the marketplace respond with cost caps. And that's a very different phenomenon than what you see on the non-competitive side of the business, when the projects don't go through a competitive bid process.

This chart here is actually from MISO, from their Duff-Coleman project that went out for bid under Order 1000. And this chart is basically showing

the 11 different bidders that bid for this one particular project in Indiana and Kentucky.

This chart shows that six out of the 11 bidders bid some form of an ROE cap in the competitive bid process. And this is from MISO's selection report. It says that three out of the 11 bidders bid some form of a cap on their capital structure. 10 out of 11 bidders bid some form of a capital construction cost cap bid, which in our mind is a real headline, because these 11 bidders that bid for the projects were not just the new entrants, they were also incumbent utilities. And so, in this one particular bid that went out in MISO, 10 out of the 11, including incumbents and non-incumbents, are bidding construction cost caps into that competitive bid process. Then you had another bidder. That one bidder did some form of a cost cap on O&M, and then you had an additional five out of 11 bidders that bid some form of an inflation rate cap, basically with the marketplace taking the inflation rate risk rather than the rate payers. And then, in addition, two out of 11 bidders bid in additional rate concessions.

This is from the MISO selection report, which was an excellent selection report in terms of how they laid out and did the evaluation process, but, quite frankly, this chart on what's happening in competitive bids across the country doesn't look a lot different. You see the same type of dynamic occurring in California. You see it in PJM. You definitely are seeing it in New York. And, basically, when you have these Order 1000 processes (and, again, there are not enough of them), you're seeing a lot of marketplace innovation.

And so, my company would respond to some of the criticism that says, "Oh, Order 1000 isn't working," and we would say, "Well, when you have the limited windows, what's happening is you get commercial innovation." And in our view that's the headline of Order 1000.

And so, in terms of how to fix Order 1000, and the issues ahead, the list is complicated, and it involves a lot of lawyers, but as we look through the history and where we've been, we think that, in general, Order 1000's qualification process has been a success. When Order 1000 was put into place, every region in the country had to establish a robust qualification process. And there was a lot of criticism, when Order 1000 was enacted, where people were saying, "This is just going to be a lot of unqualified people that are bidding for these transmission projects." Well, now that we look at the qualification process, what's happened in all of the regions of the country, is that it's the elite of the elite energy companies all competing against each other that are qualified entities. And if you go out to MISO's website, if you go out to PJM's website, or SPP's, these are credible companies that are competing against each other, and we would say that that's a success of Order 1000. There are some challenges in terms of what needs to be improved in the future, but we do think that the qualification process has been a success in Order 1000, and the reality is that the companies that are competing against each other are high caliber companies competing for transmission projects that are all very capable and able to build these projects. And that's an important foundation for a strong, competitive market, having qualified players. And, in general, we see the trend that when there are not competitive windows, there are limited cost containment proposals and cost cap proposals, or no such proposals, that are being offered in those RTO's processes.

We are certainly, from our company's standpoint, keeping a close eye on PJM and New York over the next six months, because how PJM and New York look at cost containment policy is going to be a very important issue.

Lastly, I guess two weeks ago, before the Markets and Reliability Committee in PJM, which is essentially the second-highest-tier committee in PJM, with 76 percent of the support in PJM, the vote supported PJM not only looking at

construction cost caps in the evaluation process, but also looking at ROE and capital structure in the competitive bid process. That will come for a final vote before the Members' Committee in PJM later in June, and then be filed at FERC after that, if it passes. But I think the idea of ROE competition within the PJM process is very much alive, in terms of being under discussion, and there's real discussions that are going on about how you should look at binding cost cap bids versus cost estimates, and what that looks like in the evaluation process.

In NYISO, they're right behind PJM in the formation of this policy. If you look at SPP and MISO and California, the policy in those markets is much more firm, and there are already markets that embrace ROE competition. There are already markets that embrace competition, not just on construction cost caps, but for other types of incentives as well. And I think that FERC has a role, as these filings come in, of hopefully approving them (obviously), but also providing more guidance on how you should look at cost estimates versus cost caps in these competitive bid processes. It's a fundamental issue.

And then, in terms of next steps and how to improve Order 1000, we would say that the policy is solid. The courts have upheld it. We would say that what needs to be addressed is the carve outs. So, for instance, in ISO New England, there's a disappointing scenario where there is a three year right of first refusal for the incumbent transmission owner—that's in ISO New England as well as many other markets. We have yet to see a competitive window in ISO New England, because, miraculously, everything now in ISO New England, it seems, is needed within three years, and so is exempt from competition. That's a challenge for ISO New England, and it is probably lagging behind the rest of the country and the non-RTO regions in terms of how it ranks in transmission competition.

Additional carve outs that we would say need to be eliminated include a MISO carve out, which

says that baseline reliability projects are not open for competition. Clearly, in my company's view, we think something needs to be done there.

And, as Speaker 3 mentioned, there's a growth in non-regionally cost allocated transmission projects that is occurring across the country, whether it's PJM, MISO, SPP, or California. Basically, it's kind of an end run around the competitive process. The issues with these supplemental projects needs to be addressed.

In terms of future issues ahead on Order 1000, we're looking to see what happens in Minnesota on the state Right of First Refusal legislation. The Department of Justice has weighed in, agreeing that the law is unconstitutional, and we will see soon, hopefully in the next couple of months, if the courts agree as well. Thank you.

Moderator: Thank you to our panelists. So, there you have it. It's either a well-intentioned bad idea or a competitive process that is bringing commercial innovation and expanding competition. You all can be the judge.

General discussion.

Question 1: Thank you to this panel, which I'm happy to say is addressing something that worries me a lot and I think is a very important problem.

Moderator: Are you heartened, or...

Questioner: I'm thoroughly depressed.

Comment: I succeeded.

Questioner: So, let me try to tell you why I'm kind of depressed. So, what is the right way to describe this? There are two elephants in a room. Usually we have one elephant in the room, and everybody's ignoring the elephant, and they don't talk about it. Here, I think we have two elephants that are in the room and that are embedded in the whole framework of Order 1000.

The first one is all this stuff which makes my head hurt, where we have reliability projects, and we have economic projects, and we have public policy projects, and they should all be treated differently, and we have all these different processes and procedures. And then I walk out, and I look at that transmission line going across, and where's the label? Which one is this? Is this a reliability line, or is this a public policy line, or is this an economic line? And the answer, of course, is, it's a line. And it has reliability effects, and it has economic effects, and it has public policy effects, but it's a project, and that's a line, and it affects all of those kinds of things. So, the notion that you can separate these things into buckets and have some lines treated one way and some lines treated the other way doesn't make any sense to me, and I think it does lead to all kinds of problems in the way the analysis is done, and I think it actually supports the argument that Speaker 1 made, which is, "I can't figure out the difference between efficiency, economic efficiency and reliability issues. They're all part of the same package or problems that you have to analyze." So, that's the first elephant to the room. And I think if you don't face up to that, you have a hard time going forward.

The second elephant in the room is the either explicit or implicit notion that it is possible to do a cost-benefit analysis of a transmission expansion project without identifying the beneficiaries. I think that's actually impossible. I think that it's inherent in the cost-benefit analysis in transmission. You put in the line, and the costs go down for this group, and they go up for that group—and, with the kind of examples that we've got, I mean, you can't avoid it. So, I think one of two things is going on when people say that. One possible explanation is, "Well, it's not true." So, if you did the cost benefit analysis, you know who the beneficiaries are, and allocating the costs associated with the beneficiaries is completely straightforward, in the way it was explained in that terrific graph that Speaker 1 put up. (There are other, later versions if you want, but I think that's completely simple.) Or, it is true

that they haven't identified the beneficiaries because they haven't done the cost benefit analysis, and that what's really going on here is political horse trading in the back, and there's actually no analytical justification underneath? That seems to be also a possibility, and has its own set of problems.

I thought the Artificial Island case was going to be a wonderful opportunity for the proverbial (now changing my metaphor) straw that would break the camel's back. (Speaker didn't go into the details, but you can correct me if I'm wrong), In the Artificial Island case, they applied a cost allocation methodology which PJM was using, which was negotiated and had nothing to do with anything, other than everybody had agreed they were going to use it, and then the Governor of Delaware noticed that 90 percent of the costs were going to Delaware and 10 percent of the costs were going elsewhere, and then he wrote a letter to PJM and said, "Do a cost-benefit analysis," and they said, "Yes, sir," and they saluted, and they did one, and they came back and they said, "Well, 80 percent of the benefits are elsewhere, and only 20 percent of the benefits are in Delaware." So 90/10 was completely backwards. And therefore you would think this would precipitate, "We have to rethink what we're doing." Then it goes in front of FERC, and the substance of the order was, "Eh, nothing's perfect." [LAUGHTER] And we're going to go ahead with this cost allocation methodology.

This makes me depressed, as I think this is a very serious problem. I don't see how to have a coherent transmission expansion policy that does not allocate the cost to the beneficiaries and have a competitive market for everything else. Because then you get all of the questions about, "Why don't you subsidize my generation rather than build a transmission?" "Why don't you subsidize my storage project rather than build a transmission?" We're going to be in this quagmire forever. So, how can I turn this into a question?

Respondent 1: How about not doing that, and maybe I can just answer it? You're right. The cost-benefit that PJM used was simply negotiated between PJM and the transmission owners, and they filed it at FERC, and FERC approved it. That's the best example making sausage ever. And then, when it was applied in the Delaware situation, the consequences were egregious, and PJM got that. I mean, we could all see the headlines: PJM bankrupts Delaware. And so, they had to do something.

There were a lot of strange things that happened with Artificial Island, also, in terms of the costs-- and remember, these were just estimates. And it turns out, other things were required, which changed what was required for that project and changed the cost of that project. And so, that just points to the fact that there are problems in the planning process itself, and others here can certainly speak to PJM revising all the estimates so that one company didn't get the project.

Questioner: They got the project.

Respondent 1: At the time. We're talking about a timeline. That was before the company agreed to cap the cost. So, in terms of being depressed, how do you identify the beneficiaries in a way that people can actually use that information or calculate that information?

Questioner: Look it up in the cost benefit analysis. It's there. It's already there. It's just like in the old days, when we had economic dispatchers say, "How do you find out the locational prices?" Look them up. They're already calculated as part of that process. So, it's just printing the report.

Respondent 2: Yeah, let me get to the heart of my problem. You know that I don't disagree with you on the substance of what you're saying. First, on Artificial Island, when PJM sees that what they've done is all wrong, they just shouldn't use it. That shouldn't take a genius. One of the interesting things about this, by the way, is that,

based on which project was selected, the allocation method was different. There were three finalists. Two of the other finalists, I think, were higher voltage, so you wouldn't have had this problem with their projects, which is an interesting thing. But I'm all in favor of doing a cost benefit analysis, if you can do it in a concrete, low cost way, get it done, and then we know what it is.

My concern has to do with something else. Judge Posner said, "Do a cost-benefit analysis." They went back to FERC. They had three years of litigation. They couldn't figure it out how to do a cost-benefit analysis for one line. OK? And they ended up settling it. It went back to Judge Posner a second time. He said, "No. I told you to do a cost benefit analysis." It went back to FERC a second time. FERC just approved the settlement. It's now 13 years since the 206 case was filed, and they still have to go through rehearing and appeal. Meanwhile, Posner is no longer on the court. Cudahy died. This is the way it works in the real world.

So, my comment to the questioner is, show me how to do it in a concrete way. Come in and say, this is what we're going to do, these are the assumptions we're going to make, get the litigation out of it, and I'm with you. But that's not the real world. It just isn't. And so, I don't know how to fix your problem, other than to say, this idea of spreading the highest voltage projects, sharing costs between local and regional on middle voltage projects, and allocating smaller, lower voltage projects locally, is at least rough justice. I'm not going to sit here and look you in the eye and tell you that it reflects a true cost-benefit analysis. But I just don't know how to do it without locking this whole thing up in litigation—thirteen years and two trips to Judge Posner for one line. And it had everyone's attention in the industry, and nobody could figure out how to do it. Well, they couldn't agree on it, anyway. So, that's the real world. And that's why you're depressed. You should be. Paxil, man. [LAUGHTER]

Questioner: Well, you can go back and look at the record on this, but MISO used to publish a very detailed methodology of how they did these calculations, until Order 1000 came out, and Wellinghoff basically, said that he didn't want to do that anymore, and he wanted to find some way to socialize it, so they quit publishing these methodologies. SPP had a published methodology that they quit publishing because it was not being well received by the Chairman of the Federal Energy Regulatory Commission.

Respondent 2: I just recommended that your next article should come out with the methodology. Let's do it [OVERLAPPING VOICES].

Questioner: I think the problem is that regulators don't want to do it.

Moderator: Well, they can't agree.

Respondent 3: I would just comment that, from my company's perspective, Artificial Island is something we've been knee deep in, in terms of being the developer for one portion of that project, and, on the cost allocation issue, the fundamental issue is that the Artificial Island project was triggered because PJM identified that there is a stability issue at the Artificial Island nuclear complex. And, essentially, under the PJM tariff, they used a defects methodology to determine the cost allocation associated with the nuclear stability problem. And it just doesn't work. Their cost allocation framework doesn't work for fixing this specific type of stability issue. And so, it has been painful, and it is not a good outcome, from Delaware's standpoint, in terms of in the formula. The issue is still pending rehearing at FERC, and we're waiting on the rehearing order from FERC, and we'll see what they say about it. And we think, also, that the legal arguments are strong in Delaware's favor, if Delaware doesn't win the day at FERC, in terms of the court process, as well. But, certainly, the beneficiaries should be the ones that are paying for the transmission. There's no question about it.

Respondent 2: And who are the beneficiaries? The owners of the nuclear plants? Are they the customers that take energy? And what customers get the energy, because it's a pool? Is it the generation owners? Should they be paying for it? Who are these beneficiaries? To me, it's not as easy to identify them as some might think. I think we know FERC did it wrong. I think that's easy. You and I can agree on that. And the questioner. But, how to do it right is a lot less obvious to me.

That leads me to the other question you asked, which is about not separating different kinds of projects. You want me to respond on that, too, and you thought Speaker 1 was right. So, Artificial Island was a local stability problem. It didn't have anything to do with flows, right? And it wasn't a congestion issue. It was a stability issue. And so, nobody evaluated it in terms of cost and benefits, in terms of energy prices, or anything like that. Now, maybe they could have, or should have.

Questioner: They did.

Respondent 2: No, I don't think so.

Questioner: The Governor wrote them a letter. They wrote back. They sent them tables of numbers. I got the tables of numbers.

Respondent 2: Well, what did he assume? That the plant would just shut down if we didn't do this? I mean, if that's the assumption, then I don't agree with the assumption.

Questioner: No, you just don't run it as often, and you run other plants, and you have a different plan of transmission flows, and you solve your stability problem, and that's more expensive.

Respondent 2: And we're litigating how often you run it, and when you can and when you can't, and what the energy prices are.

Questioner: That's what the cost analysis does.

Respondent 2: I understand that. It takes a long time to litigate. Is it worth the prize?

Questioner: Well, cut out the lawyers I guess. [LAUGHTER]

Respondent 2: OK. I'm close to retirement. I can buy that. All right. I don't know the answer. It's hard for me to say you're wrong, but I don't think you're right, either. [LAUGHTER]

Question 2: All right. Thank you. I'm going to pick up where the previous question started. I will preface my question by saying that I'm not considered unprejudiced in this, because our company actually supported Delaware and Maryland. You shouldn't be at all surprised about that. And I filed an affidavit with a stability methodology that FERC did reject. And, as far as the Seventh Circuit, there was one lawyer who did know he was in front of Judge Posner. That was the one representing the State of Illinois, because he had been in front of Judge Posner before. For those who don't practice in the Seventh Circuit, the Seventh Circuit does not announce the panel until that morning. Urban legend is that that's because too many Midwest lawyers used to get sick when they saw the panel, [LAUGHTER] but that was only announced a half hour before the people showed up.

My question is on the cost allocation. Isn't part of the problem (or maybe it's not a problem) that FERC, in Order 1000, said that you must have an *ex-ante* cost allocation methodology? And everybody duly followed that and filed an *ex-ante* cost allocation methodology. To say, "These were settled in a backroom..." They may have been proposed in a backroom, but every single one of those was litigated in front of FERC in a compliance filing. But isn't that where your cost allocation of Artificial Island, or cost allocation of any project, conflicts with FERC's Order 1000 policy that was upheld by the DC Circuit? So, I'd like comments on that, and if I can get a second question for later, on bringing in the non-

incumbents, isn't ROE competition essentially going to drive incumbent transmission owners to form Transcos, so they can back leverage just like all LLCs?

Respondent 1: You're right about FERC requiring *ex-ante* methodology. So, then the question becomes, after a project's approved, do we want to have a 13 year fight over the appropriate *ex-post* of cost allocation methodology? FERC wanted to avoid that. They wanted people to have some idea of who was paying when the project got approved. But we are left with a fundamental problem, and I think you know it quite well. You're going to get 10 experts in a room, and they're all going to see cost benefits differently, and we're off to the races. And the only ones who make money are the lawyers and the experts. And it takes forever, and it's not the way to run a railroad.

On ROE, you're absolutely right. ROE is like cost caps--just a game. It's how much double leverage you use. It's not real. The cost of capital is the cost of capital. If I'm building a project, at the end of the day, there's a risk associated with it. There's a capital cost associated with it. So, am I going to leverage it? Am I not going to leverage it? Am I going to use double leverage, and ask FERC for a lower allowed ROE, and actually earn 20 points more than that? That was ITC's game for years. They made a lot of money doing that, and they admitted it. So, that is fraud. It's easy to say, "Let's have ROE competition." But it's another one, like cost caps, that is really... I've done enough cost caps. I know what game that is. So, it's all very hard.

Respondent 2: Can I agree with you? ROE competition doesn't make any sense to me. The only thing that makes sense to me, in a competitive framework, is that you specify the physical and financial requirements up front, be very firm about that, admit the bidders under that process, and then bid revenue requirements. Don't worry about capital structure. Don't worry about ROE. Bid revenue requirements.

Respondent 1: But then you still have the double leverage problem. FERC refuses --

Respondent 2: The double leverage is in the revenue requirements bid?

Respondent 1: It doesn't show up. That's the problem. But it's there.

It's actual debt that's getting paid back at equity, and therefore the actual return that the developer is earning is different than the allowed return in the FERC rate. And FERC's view is, "We don't care." And the answer to that is, "You should care, because it's affecting the financial stability of the people who are building and owning your projects." So, it's just not easy.

Respondent 2: Maybe FERC rules need to change, but --

Respondent 1: Well, I'm not saying they should, ROE competition is just fraud, is what I'm saying.

Respondent 2: Well, I'm saying, don't do it.

Respondent 1: But revenue requirements is an aspect of that. By the way, FERC has said, "We're not going to let these RTOs decide what the revenue requirement is. We'll let them cap the cost, but you've got to come here after this whole thing is done and get a revenue requirement..."

Respondent 2: I'm just giving you my personal opinion.

Respondent 1: "...because we have exclusive jurisdiction to determine just and reasonable rates," and they do.

Respondent 3: I was just going to respond to the questioner. My company sat through the appellate process as folks were trying to overturn Order 1000 and all the various compliance filings. And at every oral argument, my company

was there. We were involved in all the cases. And I think that one thing that is clear to me after sitting in through all that is that the reason that the courts upheld Order 1000 and the notion of competition was for the potential consumer benefits of competition. And technical innovation is good, and that's all part of it, but, at the end of the day, the policy of Order 1000 and competition was very much a consumer-driven policy, and that's why the courts upheld it. And so, my company needs to be in the business of promoting good consumer policy to make competition work from a consumer standpoint. Because that's why the courts upheld it, and if you're pushing good consumer policy, that's good competition policy.

And so, getting into the world and discussing capital cost caps and ROEs, analyzing these is a capability that is needed, and that needs to be developed by the RTOs as well, and, obviously, it goes to FERC for approval, but it's an important part of the discussion. Because that's what brings the value of competition to the consumer.

Questioner: I wasn't questioning that. I was simply asking, will those policies force the incumbents to form Transcos?

Respondent 3: It could. But, at the end of the day, the reason the courts upheld Order 1000 was driven from a consumer policy standpoint, and if that drives the market structures, then that's what happens.

Question 3: Really good discussion. I've enjoyed it so far. First, a comment on another aspect of Order 1000. With respect to trying to make sure better regional transmission planning actually occurs, especially in those areas that don't have an RTO mechanism--where you have, instead, sort of a very balkanized system of utilities in the West--I thought the intentions behind Order 1000 were really good. I think probably all the panelists can concede that. But something I've witnessed, just in being on the sort of steering committee or decision making body of one of the planning

regions, one of these bodies that exist outside of an RTO, is that what started before Order 1000, in this organization, was characterized by the utilities sending up their engineers, who worked together to solve problems, and they didn't do it, perhaps, in a terribly efficient way. They didn't do it in a very rules-bound way. They definitely did it with the interests of their employers in mind, and sometimes they found regional solutions of a transmission nature, or the people on the supply side built co-owned, big, remotely-located generators, and all of the incumbents basically sliced and diced these projects, and got a piece of the action.

But after Order 1000 was promulgated, I noticed, in 2010, 2011, 2012, that a lot of the problem-solving engineers started to be replaced by regulatory VPs and lawyers. And, suddenly, whenever someone had a kind of outside the box idea of some way to get these utilities to cooperate in a more economically efficient manner, the response would come back, "Well, our Attachment K to the tariff doesn't require us to do that under Order 1000. Therefore, we must not." And it really has become a compliance mentality that's ended up dominating a lot of these processes, I think. Paradoxically, in some ways Order 1000 has done harm, I think, to some of its own stated ends.

There's a lot else going on that prevents regional cooperation in a place like the West, but I do sometimes wonder, if the goal is, say, a more regional, efficient market, whether it's not necessary, as a political and practical matter in some of these places, to almost somehow offer an inducement to utilities to cooperate with one another. Because you're seeing a trend now, where entities and incumbents like Xcel are looking at the process of regional cooperation and saying, "Well in, the past we would see a transmission capex upside to this. We would see a higher ROE, because the FERC base ROE is higher than states' ROE, plus, you get a bonus for joining an RTO. You get numerous other revenue requirement advantages, and, yeah, we'll

surrender some capital spending we do on the gen side, because we'll be able to share a reserve requirement, but, overall, it's not going to be terribly disadvantageous to us," and now I think they look at RTO membership and they say, "Well, why would we join an entity that is going to deprive us of our capital growth strategy by subjecting us to greater competition on transmission? We would much rather be a large fish in a small pond and dominate our state government to obtain our rents there, rather than play in the more competitive field of federal regulation."

I'm not saying that's right. And again, I completely agree with the goals of Order 1000. I just think, as a practical kind of political economy matter, it's had some of the opposite of its intended effects.

On to the question. Apologies for the long comment there. Assuming that we introduce competition into these structures, I guess I'd ask the speakers if maybe they can find agreement on this point. It would seem better to have a kind of technical planning process that specifies the thing that people are bidding for at the specific line, even perhaps a particular route, and then subject that to a competition, rather than have a competition that just has these kind of ethereal needs that people then bid in relation to. Because the latter opens you up to the examples that Speaker 2 gave, where you're getting bids that aren't apples to apples and require more discretion on the back end to be exercised by the RTO's technocrats.

Respondent 1: That's one of the suggestions on the last page of my presentation. So, it's a more limited competition. I think it's what they do in California, actually.

Questioner: Right. Do you agree with that, Speaker 4?

Respondent 2: I would say yes and no. I think that if you look at a competitive model versus a

sponsorship model, while there are clearly differences between the models, at the end of the day, if you look at California and PJM, there are actually a lot of similarities. The reason I say that is that, yes, PJM has a sponsorship model, and California has a competitive bid model, but at the end of the process, in terms of how they pick the winners and losers, it's just kind of a list of factors.

And so, what's interesting across the country is that, yes, there are variations on what it looks like at the front end of the process. But at the end of the competition process, by the time you get to the end of it, it looks a lot the same. And even if you have a competitive bid model...in California, SPP, MISO, they all have windows for people putting in their best ideas, which is kind of a sponsorship model. And then they moved to a competitive model. And so, yes, there are very significant differences between the regions, but, at the end of the day, they all have variations of people submitting their best ideas at the front end, and then more competition on the backend.

Question 4: Thanks for having this discussion, and it's been very informative. As someone who doesn't participate directly in the transmission planning process, it's a tough nut to crack. And so, my question is about transparency. Already this year, there's an ALJ decision and a FERC order that are critical, pretty harshly, of PJM's transparency in the planning process. There's an ALJ who said, "Each component of the study process demonstrates significant flaws in all aspects and fails to help the developer in his effort to know the approximate cost of the upgrade before he enters the queue." And then there's a Commission decision that says that the PJM tariff provisions are opaque and fail to provide sufficient clarity regarding opportunities for stakeholder involvement. On transmission facilities, yes, I think they're talking about different processes, but one of the issues that both decisions raise is whether the data being provided by transmission owners has been vetted by independent third parties. I'm just wondering, is

transparency, in your mind, important to opening up competition? Does FERC have a role to play here in making data more transparent?

Respondent 1: So, I would say that a big part of Speaker 4's problem is that transmission is a big black box, very complicated, and it's hard to know what's going on. But the reality is, you can open it up, and utilities will provide all of their data and all of their modeling if they don't have to compete. They're not going to supply all of that work to their competitors. And so, the competitive model has individual competitors going out and doing their own modeling and analysis, and it's all not public. And that is a big problem. OK. Yes, it should be transparent.

Respondent 2: I agree. And, actually, transparency includes replicability. So, I mean, the man off the street can't walk in and try to replicate this stuff, but you have to have your own expert who can replicate these results and hopefully understand them. Because it's also very difficult to understand the output of a lot of these models, and the larger models are just simply ripe for manipulation because there's so much going on in these large models, that there's a problem. But the absolute thing is, you have to be able to convince people that, A, you found a beneficial transmission project and, B, people can understand, or at least their experts can understand, what's happening.

Respondent 3: I think an example of that is line ratings. NERC has standards on line ratings. But whoever's making the proposal makes the assumptions in their model on line ratings. No one really checks that. So, it's really easy to alter the line ratings to favor one solution or another or to favor the project. So, there are a lot of issues that go into that that, talking about transparency, aren't even looked at.

Question: So, should FERC be doing something about that?

Respondent 3: Of course. So, should PJM. PJM should start.

Comment: I think a lot of engineers in the room would tell you that you can't mess around with line ratings.

Respondent 4: I think that if you look at the various Order 1000 regions, FERC granted all the regions a fair amount of discretion in the selection process, in terms of how they pick the winners and losers. And that is certainly important to understand transparently. How are they picking the winners and losers? And, yes, I care about transparency. Of course I care about that. But the first thing I want to know, as a new entrant, is, are they independent? If the region is independent, if they're independently making decisions, than I can get comfortable with a lot of discretion. I can get comfortable with less transparency, quite frankly. Yes, transparency is important. But the first thing that's important in setting up and making Order 1000 work, even before transparency, you have to get independence right. And the first thing my company wants to know, when we're looking at various markets across the country, is we assess very quickly on what we think is going on with respect to independence. And then a lot of issues can be addressed from there. And so, I would say, yes, FERC should look at transparency and what that transparency looks like in the selection process, but the first thing FERC should ask is, what does the independence look like?

Question 5: I'm going to switch gears again, going back to the cost allocation. And the person who asked Question 3 made an impassioned presentation about what they thought the objectives of Order 1000 were, but I've been around all 25 years of the Electricity Policy Group, and I can tell you that the origins of Order 1000 were the wind industry, and the fact that they couldn't get wind to the East Coast load centers or the West Coast if beneficiary paid, because it was uneconomic, so their whole scheme was to try and get everybody to pay for

it--to socialize it. They got legislation introduced, I think it was in 2005, with the Energy Act, maybe, that failed. But shortly after that, Wellinghoff came in and tried to do it administratively. And I'm sure that Wellinghoff would have mandated socialization of costs had he been able to get three votes, but because he couldn't, he said, "We'll leave it to the RTO's to decide how to allocate costs." And then, of course, when you get all these stakeholders in the room to try to decide how to allocate costs, you're not going to get any more agreement than you would from a cost-benefit study. So, FERC basically punted. The RTOs ended up, in most cases, doing socialization, because that was splitting the baby. That was the only way that they could get any agreement. And in my view, and I'll ask the panel this, they came out with exactly the wrong answer, and FERC just approved whatever the RTOs decided, and we've gotten into this mess now, with a lot of RTOs that have socialized costs. A lot of transmission isn't being built because of it. Some transmission is being built that probably wouldn't be built if the beneficiary paid, and I just don't know how we get out of this cycle. I'm just as depressed as the first questioner is. I think I've been depressed about this probably as long as they have, but I've given up talking about it, because I just lost hope. [LAUGHTER]

Moderator: I think we'll take that as an observation, unless you have a particular person you want to ask for a rumination, or something of that sort.

Questioner: Well, I guess the origin on my question was, I think, Speaker 2, you said that we're not going to get agreement on cost-benefit analyses, and we're going to end up litigating those. Well, we tried getting agreement on cost allocation at the very beginning, and we got it all wrong. So, maybe litigation is a better answer than doing it wrong to begin with.

Respondent 1: That's a value judgment. You know what? If the litigation doesn't stand in the

way of getting the project built, so we don't have to sit for 13 years and wait for the allocation to be done before we start getting the project built, I don't think it's the worst solution in the world. And maybe, after a couple of pieces of litigation, FERC will come out with something more concrete along cost benefit lines, and we'll get past this. So, maybe you're right.

Questioner: My problem has always been, how do you know whether the line should be built, if there aren't beneficiaries out there who are willing to pay for it? They know who the beneficiaries are. The problem is that converting that into a cost allocation brings out the worst in everybody. That's the point I'm trying to make.

Respondent 2: It's not true that we don't know.

Questioner: That's right. I think we know roughly what it is.

Comment: Progress. [LAUGHTER] It only took five years. [LAUGHTER]

Question 6: Yeah, I was going to follow up on this question about the cost allocation, *ex-post* or *ex-ante*. It seems to me that this is a huge problem, but it seems that there is a way to approach this. Once you've agreed that a project makes sense, given your expectations about the future, you get somebody that's going to build it in a competitive process, at what you think is the best cost. All you need to agree with is, to the earlier point, to a method of allocating the costs, because it is almost impossible to predict accurately what load will be in the future, what fuel prices will be, what plants will be running, to get the allocation right from the start for an asset that's going to be operating for 20 or 30 years. So, why don't we agree upfront on how you allocate the cost, and then, periodically, put the inputs in, crank out who actually benefited, and adjust the cost allocations through the life of the asset?

Respondent 1: Show me how, and I'm right with you.

Questioner: Well, the how is simply if we can agree that there is an acceptable approach to analyzing the cost-benefit. All that I'm saying is, there's no reason to have to do it all upfront. If we can agree on the approach, why don't we just adjust the allocation as the benefits actually accrue?

Respondent 1: We can't agree on the approach. Do we look at load as the beneficiaries? Do we look at generators who get to participate in the market as the beneficiaries? Do we look at the region that gets more jobs because you're building generation and transmission as the beneficiaries? Who are the beneficiaries, and who should pay? Let's start with that. OK?

And then, figure out a way to identify how to take the costs of the project and split them among those groups of people who get an economic or other benefit from this, and then we're there. OK? But we have tried, and we have always ended up back at something like what the earlier questioner described, because we can't agree. And I think what the questioner was saying is that maybe FERC ought to have just said, "We're not going to allow you to spread this. So, we'll litigate it, however long it takes. We'll come up with a beneficiary pays model, and maybe over time we'll figure out how to do this." And do you know what? If that's what it takes, and you think it's important enough (which I don't), then go ahead and do it. But I don't think we disagree. I think, from my conversations with the first questioner, though, that his idea is that you'd freeze it at the time the line gets built. You wouldn't go back in later, when things change. So, he's not really identifying the beneficiaries. He's identifying the initial beneficiaries.

Comment: No, no, it's just like the market. So, I'm going out there as an independent investor, and I build a generator, because I think I'm going to make a lot of money, and I bear the cost of the generator, and if I make a lot of money, I make a lot of money. If I don't, I don't. I don't reallocate

the cost to other people who ended up better off than I was. So you want to make it compatible with that situation. That's inherently an *ex-ante* calculation. Cost benefit analysis is inherently an *ante* calculation, and the *ex-post* thing is just a mirage. And so, --

Respondent 1: So, do we have a new model? And that is, FERC says, "You can't spread it?"

Comment: It's a license plate model, so it's just like the license plate model where you say, "Well, this region has got it, now I've got it for everything." We don't reallocate.

Respondent 2: Well, but inside the ISOs are various regions. And, ten years ago, MISO was dying to export their cheap coal into PJM. Now, it turns out that there's a good argument that says that the combined cycle plants that are being built on top of the shale formations in PJM are going to be exporting to MISO.

Comment: And the flows have changed.

Respondent 2: And the flows change, and the beneficiaries change, in that case. And, putting my lawyer hat on, if you're doing beneficiaries pay, and you see that the beneficiaries change, I don't know how you do not reallocate the cost.

Comment: That happens all the time in markets. We don't reallocate the costs.

Respondent 2: Let me just say one more thing. For those who haven't been around as long as I have, there's a strong cultural inertia in favor of rolling in costs all over the place. In natural gas, when we said, "Look, for new projects that upgrade the capacity of the pipeline, we're going to charge incremental rates for the entities that benefit." It was an outrage. We put it into effect, and a lot of the complaints went away, because the entities who were not benefitting from this incremental were no longer complaining. And the entities that were benefitting saw their benefits. But that was a huge hump that we had to

overcome. And I think the same thing is true in electricity, but electricity's a much tougher place.

Respondent 1: So, if we had a FERC chairman and two other votes who said, "We're not going to approve cost spreading. Do a cost benefit analysis. That's all we're going to approve." And let's get down and dirty, but you can't spread it. Maybe that works.

Respondent 2: By the way, you can't build these lines unless you have demonstrated that the benefits exceed the costs. So, now you've already got the analysis...well, that's what the rule says.

Respondent 1: No, no, no, no, no. For economic projects it is, but for someone building a line from A to B, to get wind in when there's lower cost generation downstream, it's not necessarily an economic benefit for the line. You're building it because you want to get wind to the load regardless of price.

Respondent 2: That's not the rule says.

Respondent 1: Sure it is.

Moderator: You can take that one off line. [LAUGHTER]

Question 7: I was just going to say that I think I've listened to every PJM TEAC (Transmission Expansion Advisory Committee) meeting (that's the group that oversees not only the market efficiency process, but the reliability process and the competitive solicitation selection process) and I've read every TEAC deck since market efficiency began and since Order 1000 was issued and implemented. And, at this point in time, I would have a very hard time recognizing the criticisms that have been expressed, based on my experience in PJM. So, maybe folks are talking about problems in terms of transparency and the way in which the process is conducted in an orderly fashion. Maybe that's not true of other RTOs, but I don't believe it's fair to say that about PJM, particularly over the last couple of years.

I wanted to say one thing about the choice between the procurement model and the sponsorship model. I think I might disagree a little bit with Speaker 4. I do think that they're fundamentally different. In the procurement model, essentially, the RTO staff identifies the project to be built, and there's competition over who gets to build that project. In the sponsorship model, competitors propose different solutions to the reliability violations, or to the market efficiency problem that has been identified. And I think the big gains, the big improvements in the system, come from the latter model, from the variety of potential solutions, and don't just come from entities competing over being the lowest-cost entity to build a given new circuit.

But in either case, here's my question: Regardless of which model is being used, procurement or sponsorship, going back to the question about ROE competition, doesn't ROE competition, in any case, expose the double leverage over-recovery of transmission owners, and isn't, therefore, ROE competition, if it does nothing else, good for that? Thank you.

Respondent 1: I don't think it exposes it. Nobody has to go and say, "Here's how I actually plan to finance this behind the scenes."

Respondent 2: Well, but they have to. I mean, that should be essential.

Respondent 3: It's not required, no.

Respondent 1: In fact, FERC refuses to look behind how it's financed. That's FERC policy.

Respondent 4: You have an "allowed ROE," and then, right after the rate case is finished, they leverage the capital structure. So, I'm not sure what "allowing" ROE means, in the first place.

Questioner: If I could follow up, what I mean is that potential competitors for sponsored projects bid less in the form of their ROE, because they're

going to bid what they think is their threshold cost that they need. And so, to the extent that double leverage is causing over-recovery, in a sense, of what the true cost of capital is, competition actually exposes that. And the same thing, frankly, with merchant generation. What we find is that the cost of new entry in PJM is actually less than everyone had been assuming it is, and we're only finding that now, in the last couple of years, because new merchant generators, new entrants, are offering at a price that is much less than PJM and the PJM market monitors thought the cost of new entry was. So, the ability to have competition is actually exposing the true cost of capital, which, it seems to me, is a good thing.

Respondent 1: We'll have to take this offline. I don't understand your point. I'm just missing it.

Respondent 3: I would agree with your comment, and I would also mention, in terms of what's in discussion right now in PJM, it is basically that PJM, when they're looking at the world of cost capped bids, would consider construction cost caps in their evaluation process. They would consider ROE, along with capital structure, in their evaluation process. Today, in PJM (which is different from pretty much all the other regions in the country, with the exception of, I guess, NYISO, at this point) they only look at construction cost caps in the evaluation process. So, if you go to SPP, MISO, or California right now, in those regions they encourage revenue requirement caps and ROE's in the competition process. And PJM has kind of laid down the law, saying, "No, we're only going to look at construction cost caps." And what's before the Members' Committee at the end of June is PJM saying, "No, we're going to look at ROE and capital structure also in the evaluation process," and putting that in place. And my company would say that's good for consumers.

Respondent 4: When you put all those together, you get revenue requirements.

Respondent 3: So, essentially, PJM's taking the stance (which is different than some of the other markets) that, at this juncture, they're not going to be looking at caps on O&M in the evaluation process. And that's how they will differentiate themselves from some of the other markets. And then, NYISO is taking up the same issue, but they're about six months behind PJM, in terms of their stakeholder process on the topic.

Question 8: Just quickly, to translate, I think what the last questioner was saying was that a risk-free 14 percent rate of return might be above market if the project is through the RTEP process, and going to be built.

Respondent 1: My point is, you can bid a 10 percent ROE, and you can be taking debt down for some of the equity you're bidding in. Say, you're bidding in a 40/60 capital structure, but 20 percent of that equity is actually debt from the parent. So, you're actually earning, not 10 percent on your ROE, but 14 or 15 percent on your ROE. And how do you get to that? And is that real competition? I think it's a really dangerous way to play the game. That's all I'm saying, and I don't think the previous questioner disagrees with that, but I think he's making a broader point, that I'm missing.

Comment: Capital structure is part of the overall, as Speaker 1 says, revenue requirements, so that should be part of the process, and when you have bidding that's the overall cost, then it exposes the ability to essentially double leverage and recover more than these purported ROE.

Respondent 1: It doesn't. The revenue requirement of the utility is based on the capital structure of the utility. If it's taking debt down from a parent and calling it equity, that doesn't show up in the revenue requirement calculation. And FERC refuses to look at it.

Comment: Exactly, which is not correct, but competition would allow that to be exposed. So, I agree with you about FERC's philosophy on

double leverage, and that's been a problem which, frankly, has existed for the last 30 years. I actually briefed this issue to the DC Circuit on behalf of state commissions and others who wanted to go drill behind the double leverage--and you're right. I mean, we were repealing a FERC order, and FERC's never wavered. It's never going to look at the double leverage.

Question 9: I continue to find this discussion of transmission cost allocation fascinating. We consider, in PJM, that the cost of transmission is less than 10 percent of total wholesale costs. And so, we're having a holy war fight over one of the smallest expenses in wholesale markets. (Just putting this all into perspective for a second.)

But I think one of the issues that comes up is that there's no difference, really, between a reliability project and an economic project, unless it comes to how the costs are allocated. And so, I think one of the issues that comes up is that we mistakenly try to categorize these two things in different ways when, in fact, there are benefits to some customers, both economically and otherwise, for either kind of project.

But the distinction ends up allowing certain parties to play games. For example, in PJM, we know that Maryland and the Eastern part of PJM, back before the days of shale gas, had predominate west-to-east flows. We know there was congestion into the eastern part of PJM. Energy prices were higher. Capacity prices were higher initially, et cetera. It probably would have been beneficial for Maryland and Delaware and DC and so on, even New Jersey, to maybe get together and build transmission to lower those costs. But why do that on your own and then pay for it yourself (beneficiary pays, right?) when you could wait for a reliability violation to be identified by PJM, have the same transmission built, have the same market effects, and then fob the cost onto everybody else.

And so, the question becomes, shouldn't we get rid of this false distinction between reliability and

economic projects, given the games that can be played about not only who pays, but the timing of the projects themselves?

Respondent 1: I think it's pretty good policy, what they do in MISO. Basically, for all their baseline reliability projects, when they are approving them they also do a market efficiency run on those projects. And if they pass the market efficiency test, basically depending on the benefit-cost ratio associated with the project, the project is essentially converted from a reliability project to a market efficiency project, and that changes the cost allocation with it as well. I think MISO has some interesting ideas that perhaps other regions could learn from on that topic.

Question 10: We've actually seen a tremendous amount of transmission being built over the last ten years, once NERC changed to an n minus one minus one reliability standard. And a lot of these projects are triggered by reliability, and are getting built. As you look at technology changing, opportunities for switching, that sort of thing, I actually don't think it's such a bad thing that there's NIMBY, and all these projects are so difficult to get built, because the amount that has been built has been pretty significant over the last 10 years, and when you see resistance from market participants whether it's Delaware or the market participants in New York, who are cancelling projects when these costs get allocated to them, I think it's an indication that you might want to look back at those benefit-cost ratios and understand if they're really worthwhile or not.

Respondent 1: I think I'm agreeing, but I think one of the hard things we face is we built a lot of transmission in New England, and there's the question of, "What did I get for it?" So, regulators are entitled to know what I got for my transmission, and we've tried to explain that at FERC and they argue, "Oh no, no, no. That wasn't because of that, the transmission line. That was because of this," and it goes on and on, and it's endless. It's not really that easy. So, for example, we've shown the congestion costs in

New England are down by about \$600 million a year since we started the big build out in New England. Well, people are saying, “No, no, no. That’s not right,” for this reason or that reason--you’re one of them. And so, we end up with a fight over whether that’s really a benefit for the transmission lines. So, the bottom line is, I think what people are saying is that transmission lines do a lot of different things, good things. Right? That’s what they’re built for. And so, categorizing them upfront as one or the other, and letting that affect the result, is not a good idea. I’m in.

Question 11: I told myself I wasn’t going to get involved in this debate, but when one of the previous questioners channeled Jon Wellingshoff and said something about, “Only 10 percent of the cost of power is transmission so we shouldn’t worry about it...”

Comment: I didn’t say we shouldn’t.

Questioner: Well, if you didn’t say that, that’s what I heard. The average cost of transmission is totally irrelevant. As you should know more than anybody, what matters is the marginal cost, and I can assure you that if you’re talking about building wind in Oklahoma to sell power to Atlanta, the cost of transmission is a really big deal. So, we shouldn’t make generalizations like that. The average cost really doesn’t have much to say about whether you should do a particular project or not.

Question 12: Well, I don’t want people to despair. All the litigation in PJM, including Artificial Island and a couple of other projects, are maybe one tenth of one percent of all the cost

allocations. And there’s something a little different about them. With respect to an earlier question about Artificial Island, it is on a methodology that updates yearly. One can argue, as we have, that it just is a square peg in a round hole. But almost everything works, and really, the discussion and the litigation and the lawyers are being paid...I mean, I wish FERC actually would say, “You’ve got your pleading, you’ve got your answer, and I’m going to throw everything else out. In fact, I’m going to charge you costs if you keep filing more and more papers.” Because it’s not helping. But it’s a small, small piece that’s being fought about.

Comment: The reason the first questioner is right to be depressed is that people cannot even agree that using the DFAX methodology made no sense in the context of Artificial Island. We couldn’t even agree on that, which is so obvious.

Questioner: We did, and it’s only one tenth of one percent, or three or four projects, (by the way, all in one zone), that are the problem. Everything else, no one’s yelling about. And so, I do think you need to put it in perspective.

But all I want to do is say, we really need to step back and put it in perspective, at least in PJM. It is really only the very few projects that are being argued about. It’s not like the whole thing is falling down. As to the two remands...again, then I was arguing for the Illinois company. It was a gross injustice. OK? Hundreds of millions of dollars into Illinois, but so what? It’s over. More or less.

Session Three.

HEPG: 25 Years Old -- Looking Back / Looking Forward

With enactment of the Energy Policy Act of 1992, Congress advanced open access and competitive wholesale markets. The HEPG formed to help policymakers, the industry and its regulators address the implementation of the Act and its consequences. What followed, of course, was far more than the enabling of open transmission access for the then relatively few wholesale transactions. Since the passage of the Act, there arose market-based pricing of energy, formation of organized regional markets operated by independent system operators, LMP, unbundling, demand response, and a host of other unanticipated changes. Many of the states opened up their retail markets, a trend that was slowed by the California Crisis. Beyond the issues of market structure, the industry was presented with environmental challenges and new technologies with disruptive effects.

Moderator.

Well, ladies and gentlemen welcome to the past and the future. We're going to try and cover it all. We'll probably miss the present in the process. But let me just say how delighted I was to be invited back here this morning. Frankly, as a former member of Congress, I'm happy to be invited just to be about anywhere in America. [LAUGHTER] But I did want to say that I am from the past, and so I'm going to speak about the past. I served time in Congress in the last [LAUGHTER] millennium, when Americans actually loved their Congress. And if you believe that, you're going to have trouble dealing with these issues.

I'm going to speak just for a few minutes and then turn it over to the people that are going to bring wisdom to bear on the current and future situation. Just as a backdrop. I was involved, as some of you know in the EPACT of 1992, which in part helped create the restructuring that went on, and has been going on now for the last 25 years, and has kept HEPG afloat.

Just a couple quick background comments. Others can correct my history, if I'm in error, but, frankly, at my age, if I'm in error, it doesn't matter. [LAUGHTER] First of all, we were in an era of market liberalization, which is not always recognized. And by that I mean that we were going through, indeed, in both political parties, less so on the Democrat party, but even there, it

was going through a transformation that said these massive regulatory systems that had been created, some before the Great Depression and some during the Great Depression, just weren't fitting well in modern society. And so, people don't realize this about Jimmy Carter, but he abolished, or the Congress abolished with him, the Interstate Commerce Commission trucking regulations. There were a whole series of these kinds of things, which said, maybe the government isn't so effective at economic regulation.

Now, that's quite a difference from environmental regulation, which was coming on increasingly stronger during those years, and I personally believe much of it was very important (some of it's crazy, of course). But so, we had this generalized proposition in energy policy making, which had been an obsession of lots of people, including several in the audience here, during the 1970's, which was focused primarily on our dependence on foreign oil. But there were always other issues. We had gained some real hard experience. One, we had lifted the price controls on oil, which had only been temporary, and the very long-standing price controls, well head price controls, on natural gas. And, guess what, the Americans did not end up facing massive price increases, unlike what the critics had said would be the case. And so, we were beginning to develop some experience that, hey, by the way, getting the government out of the way for some of these things actually works very effectively.

And economists had been telling us that it was not a smart move to try to impose these kinds of price controls on oil and natural gas. We were a little slow to recognize that, but nonetheless, we got there. But also, what was bubbling up at that time was the changes that were underway in natural gas. Not only had we in Congress deregulated the thing, but FERC was moving forward with Order 636, and beginning to unbundle the service and say, “Hey, wait a minute. This pipeline monopoly can actually behave in a different way, and people can compete to make use of its services.” And that sort of defined the conventional wisdom.

In electricity, the convention was (and I gather that somebody at DOE actually said this again, which we haven’t heard for years) that electricity is a natural monopoly, and the conventional wisdom certainly was that you may not like monopolies, but we have to learn to love them and live with them, because that’s the only way you can protect the economy and protect citizens and make sure they get electricity on time, or at least roughly on time, 9/10ths of the time kind of proposition. But the fact was, there were critics, and complaints from all kinds of people about monopoly behavior. Whether it was accurate or not doesn’t matter, but it was surely part of the mantra in the society. Frankly, for my part, I represented Richmond, Indiana, a very conservative part of my district. My whole district was conservative. I was a Democrat in a Republican district. Shows you what kind of bastards existed in the system in the past. {LAUGHTER} But what happened was Richmond Power & Light, a municipal coal-burning utility, had extra power and they wanted to sell it. Guess whose wires they had to go over? Indiana and Michigan Electric. Guess what the view was in Richmond? The monopoly power had no desire to have this kind of competitive operation. They denied it, they denied it. They had to pay fair rates, and all that kind of stuff, but we had a hearing in my district on this, and it transformed my political life, because the conservatives in the area didn’t like the New

York lawyers representing the AEP, frankly. The point being that that kind of experience was widespread across the country, and it really influenced a whole number of Republicans and Democrats on the Energy and Commerce Committee.

And of course we’d already begun, with various policy steps at the Federal and State levels, to start to break into and penetrate the monopoly system, and PURPA is the classic example of that.

But another development that I think people don’t always appreciate is that, before we legislated, there had actually been a lot of stakeholder groping. That’s what I called these groups that tried to get together and tried to figure out if they could come to agreement. This is a case that actually worked. A number of people, industrial representatives and industrial users, some environmentalists, some residential consumer groups, even some utilities, got together and said you know what? This PURPA (or PUHCA as it was known in its day), was what prevented anybody offering up power unless they were regulated as a utility. Roughly, that’s what it was, and they said, “This doesn’t make sense in today’s world, and we ought to challenge these monopoly owners and let some other people into the business.”

Well, that helped lay the political foundation for the Bush administration. President Bush won, recommending that we undo the PURPA pretzels and begin some reform on that score. In the Commerce Committee, we added, on the House side, the power of FERC to be able to order wholesale to try to get a little more competition in it. Now, what I want to indicate here is that I was unaware (and I don’t think I was the most ignorant one in the House and Senate at that time) of any real design that was out there for creating competitive electricity markets. There may have been some in academia who laid it all out, but there wasn’t a design. That wasn’t our vision. That wasn’t what was happening, “Oh, now

we're going to create competitive markets." What we in fact thought we were doing was, we were trying to interject into this monopoly system at least some more elements of competition. The point being that we've been discussing here, for 25 years, really, transformation of this industry, and all I'm trying to say is that at the beginning, that wasn't actually the vision. And, to be frank about it, if it had been the vision, it would have gone nowhere. The "Just say no" utilities, which were highly organized, frankly, I think, accepted and did not fight it in the way they would have, had they realized how transformative it would become. And, by the way, I think most members of Congress had no idea what was going on. It was apparently a small number of people that tried to deal with these rather complex issues, and since we weren't doing much, who cares? And the administration was for it. A number of Democratic energy leaders were for it. So, it was blessed and went forward.

I say that, not to be critical, but just to say that this is partly the way we do things in America that actually begin to get us somewhere. So, in fact, there was no vision of a competitive market. There was just a desire to interject.

Now, the basic provisions I've already kind of alluded to are fairly simple. One is to undo some of the PURPA constraints, so we can get some new generators into the system. The other was to try to overcome monopoly control of the transmission grid by giving FERC the authority. The authority, actually, if I recall it correctly, would simply allow you, as utility, to petition for the right to force transportation across--so that's a one shot deal. That's case by case. That would be very slow, if it hadn't been for the wisdom of FERC, later, to really take this much farther. And then there was also what some people called the "savings clause" of the authority, where we said, "Oh, my God. If they thought we were dealing with retail wheeling and retail markets, we would be in deep trouble, because that was the sin of taking power away from the states, and there would have been a revolution in America, making

the Whiskey Rebellion look mild. And so, we didn't touch that with a 10 foot pole, and we put in a provision that actually acknowledged that we weren't touching the state markets.

Now, frankly, if you were really were going to design competitive electricity markets, you probably would have said, "This is an artificial distinction between retail and wholesale markets. It doesn't exist in most other activities," and the division of authority between the federal government and the states, which is somewhat ambiguous anyway, you certainly wouldn't maintain that. And you would do all kinds of things that would help design this, if you were starting from scratch. But, of course, we weren't.

So, what then happened was that the speed of this thing really accelerated, for, I think, three different reasons. First of all, a couple utilities wanted to start engaging in and have open access, and so they were ready to petition FERC and whatnot. But it was the magnificent dream team led by Elizabeth Moler at FERC which came up with Order 888. And that really began to accelerate things, and then, on top of that, a number of states...If you go back and you look at the data on the pricing comparability across states, what you'll find is that those states that, comparatively, had high electricity costs began to see, "This is the way to bring those costs down. We're going to open up these markets." In fact, I think you can almost trace exactly what happened, up until California, on the basis of whether states were high cost or low cost. But that state action just accelerated things, and, of course, Nora Brownell and Pat Wood, among others, were very much involved in these things, before they were Federal regulators.

Let me just conclude with a couple of comments, because I'm trying to improve my lectures at Georgetown on transformative policy. I'm engaged in trying to hope we're going to transform a whole sector of this economy into low carbon. And we're almost there. (That was a joke.) I think, especially for people that enter into

this business, that it is very easy to dismiss all of these kind of efforts that are made, that are half-baked or half measures, or whatnot, and think, “Well, wouldn’t smart people do it differently?” And, of course, if you had a *tabula rasa*, and you could just create things new, you would do it differently. But this is the key insight that Senator Moynihan had, after the failed effort of the Clinton Administration to try to transform the healthcare sector. He said, “Look, what we’re dealing with here are well-established institutions and practices and complex relationships,” and he says, “You just can’t go in and intellectually redesign that and expect to make a policy that’s going to actually work and be accepted.” He said, “That’s different than when they created social security from scratch, and we were just starting out.” It was creating brand new institutions that didn’t compete with so much with existing institutions. And I think the thing that has to always be remembered is, all these different players come with different priorities and different goals. And, by the way, those goals change, even for those individuals.

And if you look at what’s happening in electricity, my sense is, some of you in the room, and some organizations, had tried to have a singular focus on trying to get competitive markets. But the vast majority of players have other priorities, so it’s very hard to have a sustained focus on a policy goal that you can keep everybody focused on. Now, if you just look at the current administration, just this most recent executive order on resurrecting the Defense Production Act of 1950 (we debated about invoking that during the crisis of energy in the 1970’s, and I think it was for a couple limited purposes), I find their interpretation way beyond the pale, and if you like intervention in the government, you’ll like what they’re trying to do in the marketplace, but if you kind of think there ought to be restraint from the federal government, it is absurd that they’re trying to keep a few coal plants open by the Defense Production Act, which was not, in my view, intended for this, or

at least that’s a real stretch in terms of what is the national defense.

On the other hand, why not let the next President use it to make sure, not only that the nuclear plants survive, but that we actually take aggressive action on a national defense, if you want to use that broad definition, against something called climate change. And I just find that it’s a tool that is not appropriate to this. But it shows you the different goals. They have conflicting goals. Everybody has conflicting goals.

Let me mention, also, besides this complication of transformative politics (and maybe I’m making an excuse for why we never designed it right), it is recognized, and that’s just the way we work in this country, that there is an intense anti-politics feeling in the country, and has been since the beginning. You can find it in academia. You can find it among my farmers back in Indiana. You can find it in every walk of life—“If they’d only get the politics out of this.” Well, by the way, the Church would work better, the family would work better, the schools would work better, if you could get politics out of them. Meaning, get human behavior out of them.

At one conference here several years ago, one individual got up and said, “Well, what’s really important is that we keep the regulators insulated from politics.” Now, I understand what the person was alluding to. There’s lots of political behavior you’d love to keep out of the door. But let me suggest a couple things here about that. What’s important is that we have differing institutions with different processes and different ways in which they deliberate and they decide. A political campaign is massively wide open. Congressional debate is not that. In the regulatory system, what we want is, of course, that there’s an opportunity for serious people to engage. There’s evidence collected. There is serious deliberation that goes on. But many people (or at least some of my students and others) jump to the conclusion that, the facts dictate the decision, or

rationally adopted logic. That's the non-political way. We make an argument with facts, and we win the argument.

Well, on most major decisions, I think it's actually quite different. These facts are important. These efforts are important, but you can't get everybody on the same page by logical argument, because they have different interests and they have different goals. And what you have to do is bargain. Now, sometimes that's wrong. Sometimes it's bad, and you don't want to go that direction, but that's what high order politics is about, and that is what the high order of politics of Order 888 was all about. And that's why the Dream Team of commissioners at the time was so successful. I'm sure there were people at the time, I don't remember, who argued that doing all of this stranded cost protection was highly questionable--in some cases, arguing from logic. But in terms of getting a decision done, they made a fundamental compromise, or agreement, to the effect that, we're going to get open access, and we're going to also try to protect stranded investment, and that kind of thing. I personally think it's questionable, viewed logically, but it was smart, politically, to make it happen.

One other thing I'll say about the Dream Team, going back to this question of what you want in regulators--of course, we want smart people and, of course, we want people that are honest and dedicated. But we do want them to have some political sense and engagement. And one of the things about that dream team on FERC was that I think three came off the Senate staff. (Maybe a fourth one did, as well). What that meant was that they were in the habit of recognizing what these big interests could do in terms of rushing to Capitol Hill and getting somebody to try to protect them legislatively, or to fight FERC, or whatnot. And, given the Senators they had worked for, very prominent people in the energy sector trusted Betsy. They trusted Don Santa and Bill Massey and whatnot. They had credibility that helped them get this over the line--because, don't forget, it was being fought every step of the

way by some utilities. And opponents misjudged the speed with which the change was going to happen. They began to accept the idea that, "Ooh, Congress has the backs of this team." We actually had a hearing, in the Energy and Commerce Committee, in 1993, with Betsy and the whole team, and just to reinforce that we meant business. We want you to do something. We didn't know what we wanted them to do exactly, but we wanted them to have competition.

So, what I just want to bring this back to, is that transformative policymaking is very difficult, and it's very important to try to rationally design things, but you don't start with a rational design and really expect it to get implemented. You try to desperately get there. The second point is really that there is something called high order politics that we have to appreciate, recognize and support. You cannot get the purity that lots of people would like. (Of course, the "purity" that most people like is what I believe in, not what you believe in.) And this, frankly, to me, has been the wisdom of our Constitution and the wisdom of our Senate, and I promise to stop pontificating and to turn from the last millennium to the current millennium. And with that we're going to turn to our friend here, Speaker 1.

Speaker 1.

Thank you for that history of the political genesis of these markets. I'll just begin with an observation about what markets are and why regulators should be interested in markets. Regulators should always be looking to replace a command function that they exercise with one that orients around a market. And some regulators perceive that, intuitively, to be true. Some regulators go out and declare that, but I think everyone realizes, in some way, shape or form that setting moneyed interests in a competition against one another, where they're vying somehow for the business of consumers, is preferable to a competition where a moneyed interest appears before a regulator and makes a pleading to try to obtain rents directly from the regulator.

It's a difficult thing for regulators to have to admit, because, as politicians, fundamentally, we want to exercise our prerogative. We want to exercise political power, but the better part of valor is our discretion in trying to substitute our command function with something more. These markets don't have a mind of their own. They're human constructs, especially administrative markets, whose demand is, at least in part, a function of technocratic judgment, and not the organic and individuate demand of someone like myself choosing to grab a beer at Shay's rather than Charlie's.

So, let's take a charitable view of the recent political agitation against the electric markets. Let's imagine that, rather than mere rent seeking, there's a genuine disagreement about what variables these markets are solving for. In other words, rather than a result that epitomizes least cost and reliable in the short run, which is largely what we've been asking the competitive wholesale markets to do, let's posit that there's a credible objection that can be made that these markets should solve for other variables, be they environmental externalities or variables like reliability.

The problem with this approach, it would seem, is that even if those good intentions are ascribed to the agitators against these markets as they exist today, there aren't, there are very scarce proposals to actually define these other variables that these markets would solve for. There are few people actually offering up product definitions for that type of trading, within these markets. And that, sadly, is because of what we all know to be true, which is that the real dissatisfaction with these markets stems not from the fact that they're not working, but that the promise of winning all the time, winning so much that you're sick of it, is not something is happening for certain political constituencies, with respect to these markets. And the representatives of these constituencies--in the form of regulatory VPs and CEOs, the leaders of NGOs and Labor Unions, as well as their clients,

who are certain credulous State Legislators, Congressmen, even much of officialdom, have swung into action to sort of be that change in the marketplace.

And so, we're stuck with a kind of doublespeak. I hear "resilience, resilience, resilience," which in fact seems to mean quarterly earnings and jobs. And it's not just Republicans engaging in this doublespeak; its green jurisdictions, too, who, despite an ostensible goal of mitigating climate change (which would suggest targeting actual emissions of carbon dioxide) instead adopt policies that actually target something else--more and more megawatt hours of renewables, where some megawatt hours are more equal than others, especially those that get created in state or are produced from offshore wind farms, or whatever.

So, the sad reality of earnest attempts to define these products, such as FERC's effort to define resilience, is that it's not going to satisfy the real intentions of many of those advocating action on this front. And the same goes for the New York ISO, which, as it pursues carbon pricing, is going to be aiming at the ostensible target, and therefore, paradoxically, missing the mark.

So, the bottom line is this. If you don't actually define what you want from these markets, if your politics are not candid enough to admit their true intentions, you can't expect these markets to deliver policy ends that are satisfactory. These are man's inventions. Man is asking them to solve for particular variables, and that leads me to wonder, is there sufficient political will for the existing market's stated ends, least cost and reliable electricity, such that these markets have a constituency which might defend them and save them?

Here comes the lemonade, everyone. [LAUGHTER] It gets marginally better. [LAUGHTER] The good news, frankly, for those people who defend competitive wholesale markets, is that the alternative, regulation, doesn't have a lot to write home about, in many

instances. The grass is always greener for people who criticize anything, but as someone who lives in a region that has not had particularly competitive wholesale markets, that hasn't, by and large, restructured, that's still vertically integrated, that's still governed by the command decisions regulators, I'll play the grass is always greener card myself. Fundamentally, what you're seeing in the western United States is a growing divergence between what customers are paying and the wholesale price of energy supply, which if consumers were allowed to avail themselves of it, would be dramatically less than the regulated cost of energy supply that they pay for. Just to give you a couple metrics on this, two weeks ago, when I checked the mid-Columbia prices, off-peak ranged between \$5.00 and negative 10 cents per megawatt hour. On-peak maxed out for the week at about \$25 a megawatt hour. So, you're talking about a situation where the retail energy supply price for the regulated utilities there is about two or three times the peak price at wholesale.

Utility regulation used to feature these pitched battles between marginal cost studies and embedded cost studies, at least in the era when marginal cost studies were a thing that regulators tried to take seriously. They were trying to get at a price that replicates the economically purest concept of pricing at the marginal unit's variable cost. One obvious problem of this is that such prices don't reflect the actual embedded cost of running the utility, which the utility, under our regulatory compact, seeks and needs to collect. So, one could price energy supply at its marginal cost, and then make up the difference through a non-bypassable surcharge or rebate, but such a rate design would end up looking a lot like a Costco membership, or a cell phone plan, for that matter.

So, although state regulators have attempted to experiment with time of use pricing, this methodology of rate setting has not really been an attempt to match or anticipate the marginal cost, or the wholesale price, of energy, but it's

generally continued to be concerned with setting prices to recover embedded costs. And so, although we talk about the changing utility business model, the missing money problem, the utility debt spiral, the end of coal, or even resilience, these buzzy phrases are often just symptomatic expressions of the misalignment of retail and wholesale pricing of energy supply.

Just as politics surrounding the restructured competitive markets seem aligned, in some ways, to undo competition, or to invite government intervention, it has to be said that the misalignment of retail and wholesale prices in traditionally regulated jurisdictions is becoming, in its own ways, politically untenable. This is being seen in the western United States through the "direct access" movement. This is often dressed up in stories about corporate social responsibility and the desire to be greener than the utility's default offering. That may be true, but it's clearly not the full story. The real story is that certain utility-scale renewables have become extremely cheap and available for PPAs, even while the costs of less economic renewable mandates as well as out-of-market long-term procurement by utilities are built into the cost structure of the regulated retail energy prices. And so, we may see, for the first time in a long time, something remarkable this November if, as is currently expected, Nevada, at the urging of certain large customers, passes a constitutional amendment to its state constitution that mandates the restructuring of the state. Meanwhile, some of the publicly-reported direct access arrangements that are already permitted in the state's regulatory regimes are remarkably cheap.

In Montana, we already allow all of our large customers, if they have a new load, to go to direct access, to go directly to the wholesale market. One of those new customers in Montana, a 64 megawatt load, on average, just signed a five-year contract for around three cents per kilowatt hour for the energy supply portion of their bill. Now there are clearly some perverse incentives at play, in a context where some customers remain

legally committed to a default supplier, while others roam free. What amount of the contract's value that I just mentioned is tied up, for example, in the expectation of the seller and the buyer that regulated utilities have gone long on resources? In other words, this can be regarded, in some ways, as a bet that regulation over the bulk of power generation in the Pacific Northwest will function to keep in service sufficiently large quantities of energy and capacity at retail rates that are about triple the contract price to ensure the stability of a side transaction on the wholesale market. But many parties throughout the Western Interconnection are making bets like this, including not only direct access customers, but large pieces of California's load, in the form of community choice aggregators.

Another trend is militating in favor, also, of a market which is ultimately competitive, or at least rightly priced, and that is technological innovation and disruption. Even when disruptive technologies are not in themselves valuable, they can become leading indicators of the unsustainability of a planned utility model. And here we just need to harken back to the telecommunications industry. AT&T and Ma Bell once had the same problem. The marginal cost of making a long distance phone call on its network was extremely low, which is not to say it was priced extremely low; the price was rather high. Retail rates for long distance calls were priced like retail regulated rates for energy supply are today, to recover the embedded cost of the network. And, ultimately, the price was so unreflective of the underlying network economics that MCI and Sprint disrupted long distance market technology with another technology, microwave, which, on whole, was probably less economically efficient than wire line technologies. The social service that microwave technology performed had less to do with its economic efficiency than it did with its purifying effect on telecommunications regulation, which was effected by revealing Ma Bell's long distance rates, indeed, almost its entire regulated cost structure, to be an economic

fiction. There's no need to bore you with the history, except to say that this incident was a seminal event in the unravelling of the whole Ma Bell ball of yarn, a moment where the emperor's nakedness was revealed, not just by eggheads, as an academic matter, but as a practical matter. (No offense to the eggheads in the room.) [LAUGHTER]

So, will a similar trend occur in electricity? I'm not sure. But I will, again, make this point. You can think storage is an idiotic and totally uneconomic device. Maybe it is, maybe it isn't. You can regard DERs of other stripes as a complete scam. They don't need to be economically efficient in order to reckon, nevertheless, that they might have the same effect as a disruptive technology on the telecommunications side.

Will trade "find a way?" Just like how, in Jurassic Park, Jeff Goldblum's character memorably observed, after finding that males mutate in vitro to the female sex in reptiles, that life will "find a way?" Many people have been critical of *homo economicus* over the years--this idea that people, with no transactive frictions, perfectly and rationally conduct trades. But there is reason, at least, to think that, from the baseline in which we now exist, certainly in the western United States, trade will find a way.

And the West is looking particularly hopeful these days, after a history of any given western utility being the boy in the bubble, hermetically insulated from others. For a few wholesale transactions here and there, the allergy to RTOs, and California in particular, is abating. California is a massive load and resource center, and it's not conceivable that there will not be a robust trade in electricity with that State. A trade, for that matter, conducted on a more automated, efficient basis than currently exists.

Now, the things that make a Montanan's skeptical of California, ironically, also make it appealing. And I'll give you an example. Montana and North

Dakota have a great relationship. They're a little slower than we are, less sarcastic. They talk slower, but they're great people. They're great people, but we don't, despite our wonderful relationship with the North Dakotans, have a robust trade in, for example, cattle. It turns out that we both have a lot of cattle, and Montanans could make a game effort at eating many, many steaks (I personally do my part), but try as we all might, we're not going to consume the cattle production of Montana. Neither is North Dakota. And if a trade in cattle existed only between us and within our borders, you could end up buying a steak for a few years for one dollar a pound, until producers simply gave up and started a new business. Happily, it turns out that other people are willing to eat steak. And in what really is basic Adam Smith comparative advantage stuff, Montanans sell beef to them, and we get, for example, textiles back at the local T.J. Maxx from places where labor and material inputs have a comparative advantage over what any U.S. state might offer.

The same thing happens with electricity, due to the diversity of loads and resources over the course of the day, the course of the season and the course of an El Nino cycle. Likewise, when you introduce to a trading relationship diverging subjective perceptions of the value of the underlying product, that increases the benefits of a potential trade. For example, my fiancé (I'm getting married in two weeks, everyone), asked me to buy only organic produce--but I'll be candid. When I go to the store and find that the Roma tomatoes that are organic are priced at five times what seemingly identical tomatoes are priced at, I often just opt for the latter, carefully tearing off the labels before I go home. [LAUGHTER]

But it's precisely because my fiancé and I, and millions of people like us, disagree about the value of tomatoes that the trade in tomatoes has diversified over the years, because of the comparative advantage of various producing and

consuming parties when a new subjective variable is added.

The market in electricity is similar. It's precisely because our view of the value of electricity differs in the western United States that there's room for trade. California perceives a negative value to forgone electricity production from renewable resources, while others might view the marginal cost of lost renewable energy as merely zero dollars, or the inverse value of the production tax credit. Different strokes for different folks.

The market rules that facilitate trading in an environment like that are going to be more complicated, depending on the number of variables we are asking a market to account for and solve; however, that shouldn't be understood to suggest that such a market is impossible, or that the differences in policy makers' perception of energy somehow erode the value of a market, merely because of political differences. Indeed, quite the contrary.

So, hopefully I've offered a glass of lemonade that is not too sour, but probably not too sweet, in the course of these remarks. I appreciate the opportunity to present, and I look forward to the most invigorating feature of HEPG, which is the open discussion. Thank you. [APPLAUSE]

Speaker 2.

I'm going to talk a little bit about the future of energy from the utility perspective. As we look forward, we're preparing for change in a few particular areas. We see a future that involves people using less energy than they are right now, energy that's cleaner, energy that is more reliable, energy that, hopefully, customers are paying less for while, at the same time, our shareholders still get a fair return on their investment. So, as I move forward with this presentation, there are really three of those areas that I want to focus on, and they are energy efficiency, clean energy, and resilience.

On energy efficiency, this is an area where New Jersey really still has some work to do. The slide shows that on one recent energy efficiency measure, New Jersey comes in ranking 30 along the scorecard of states. There are states, plenty of them, which are doing much better.

What are the reasons behind some of that? It's because they have concrete goals that have been set for them on energy efficiency. Their states are really pushing utilities to drive energy efficiency, and within those states, they've eliminated certain disincentives for utilities to engage in energy efficiency efforts that have helped move that ball forward.

The benefits of energy efficiency can really be significant. States that have been promoting energy efficiency, like Massachusetts and Rhode Island, are saving more than six times what we are in New Jersey right now. By our estimates, in New Jersey, if you reduce consumption just by two percent, the savings are pretty significant. You can save consumers \$130 million. You can eliminate a million tons of carbon, which equates to taking about 200,000 cars off of the roads.

So, how do you go about doing that? Well, from our perspective, incentives are really the key. And right now electric utilities have a strong incentive to sell more electricity. That's how we wind up making money. And energy savings cut into that bottom line. So, in order for this to work, the regulatory framework is going to have to be adjusted, and it's going to have to send the right signals, provide the right incentives, because if you do that, utilities, in turn, can be a really powerful tool for implementing change and innovation and, in turn, energy efficiency. But you need the regulators to engage on this issue to send those directions to their utilities and provide those incentives to deliver less electricity.

The second area we're seeing change in is change in customer expectations. When we poll our customers on, what is it that we as a utility can do better, what do you think the number one answer

is that we get back from them, by far? Lower rates. [LAUGHTER] Not surprising, it's lower rates. But then the number two answer is more renewables. Investment in renewables. Just a bit of conflicting feedback there. But at our utility, we responded. We have invested 1.7 billion in solar energy projects. We built solar farms on land that can't be used, really, for other things--landfills, industrial sites. We've expanded our investment beyond the borders of our state to now go into 14 other states. We have put millions of dollars into rooftop systems, and we are really eager to do more. In addition, we're also looking at cleaning up our existing generation fleet. We have closed our last two coal plants in the state. We've invested two billion dollars, at the same time, in combined cycle units--three plants in the eastern organized markets. And, most important, and something people have touched on, and that I think we'll probably discuss more, we have worked with the state to preserve 3500 megawatts of nuclear generation in the state. And that's significant, because nuclear is important for purposes of promoting clean air, if that's what your policy goal is.

And I think that goes back to the topic that Speaker 1 talked about earlier, which is, really, what is the goal that we're trying to accomplish? As you can see, from a nationwide perspective, nuclear accounts for about 60 percent of carbon-free generation. Renewables come in at about less than 20 percent right now. If you look just at New Jersey, those numbers are significantly different. Nuclear is ninety percent of the carbon-free generation in the state of New Jersey, with renewables accounting for about 10 percent. So, the numbers are significant. Replacing nuclear, in a state like New Jersey, with renewables...if that's the substitute, it's going to take many, many years. It's going to take many, many millions of dollars, not to mention the fact that the technology really isn't there right now on a scale that would allow you to accomplish doing that. So, renewables are a big part of New Jersey's future, but right now, we can't get there without preserving nuclear. Our bottom line in the state of

New Jersey is that, when it comes to nuclear, right now, it's cheaper to keep it.

So, that brings me to the third topic I wanted to talk about, which is resiliency. I'm not going to spend a whole lot of time on that, but our experience has been that events like super storm Sandy have really exposed the need for a more resilient and, ultimately, a more reliable system. We have made some significant investments in terms of things like raising substation platforms to avoid the consequences of flooding. If you remember back to my earlier slide with the old guys and the wagon and the horses, we're still using gas pipelines that probably were laid by those guys, today. So, we've gone through an extensive effort to replace some of that aging gas infrastructure. We're also looking at rewiring and upgrading some of our transmission system. Again, we're talking about facilities that, in some instances date back to the 1920s. So, we've certainly, and consumers certainly, have gotten their money's worth out of that investment.

We think the future is looking pretty bright. We're going to focus on less energy being used. That energy is going to be cleaner and on a system that is more resilient and hopefully more reliable. So, with that, I'm going to conclude my presentation.

Speaker 3.

It's an honor to share the dais with my illustrious fellow panelists

The Philips decision that involved the regulation of natural gas, in 1954, was probably the most irrational decision by the Supreme Court in economic regulation ever. It ultimately led to the Fuel Use Act, in 1978, which said that we were so short of natural gas that we would make it illegal to use natural gas in new power plants, if you can imagine that, 40 years ago. I mean, it's just unbelievable.

Well, the three branches of government managed to stumble on rational policy, as the decades

unfolded. I listed the major things that happened, including the *Maryland People's Counsel* decisions and FERC Order No. 436, and these were somewhat of the precursors, from the gas side to the Energy Policy Act of 1992. And Professor Dick Pierce wrote some wonderful things, back in those days, about how the electric industry had performed very poorly in the '93-'94 winter, even though the Energy Policy Act had just been passed, but the natural gas reforms had been kicking in. So, in this article, "Reconstituting the Natural Gas Industry," he was saying, "Well, it's interesting to speculate about the manner in which a market-driven electricity industry might have performed during that winter in which it performed very poorly." And I would say that, twenty-five years later, we pretty much know the answer to that.

I'd like to discuss a little bit about what I think hasn't changed. One of the things which I think is just surreal and unreal is to read descriptions of New Age summits and conferences and workshops which are just so laden with buzz words and jargon as to be incomprehensible to me. But I think the reality is that the physical design of the industry hasn't fundamentally changed in many ways, and the basic product of the industry hasn't fundamentally changed.

Just to illustrate this point, this generating plant to customer flow diagram is the grid in 1992, it's the grid in 2018, and I think it's going to be the grid in 2043. In a certain fundamental sense, I don't see a lot of change.

And similarly, our product. This picture of an electrical outlet is the cover of our product. It's still 120 volts, at 60 cycles per second, alternating current, right? So, 100 years later, our product is still version 1.0. So, it's important not to get too carried away with some of these things.

Now, as to what has changed, well, I was going to say one word about Plain Old Power Service and talk about the importance of it. It's here to stay. My fellow panelist, Speaker 1, profoundly

stated that regulation is pretty boring, and it's meant to be. And disruption is a lot easier to pedal than it is to actually do. And if anybody doesn't think that Plain Old Power Service, at the lowest reasonable cost, is our *raison d'être*, they should just ask Puerto Rico, because that is what's really, really important about our business. We should never lose sight of that.

Now, on what has changed, of course, within the physical design of our industry, there have been fundamental changes in how industry elements are owned and managed, and we've had this increased unbundling and competition, which our moderator talked about very articulately, and, of course, he was there. And, as I think about the panelists yesterday and today, I hope we're not going to debate (well, maybe we will in this discussion session) about whether competition is a good thing, for all intents and purposes, and, I would say for almost everything, including transmission (not distribution by the way).

I apologize for including a slide on transmission, which we talked about for three hours yesterday, but I just couldn't resist. I just wanted to give one example, from PJM (there are many PJM examples I could have used). When you have a single congested corridor in PJM, they get 44 proposals from nine different entities, ranging in cost from six million dollars to \$192 million, and this is typical. And I think the variety of what has been elicited in proposals from competitors and transmission under the sponsorship model has been eye opening. Absolutely eye opening. And also, to the cost of running this kind of competition, the application fees from the sponsors have actually been more than PJM's administration costs. So, can you believe it? The thing actually pays for itself. The only thing I could say is, harking back to some slides from yesterday, we should just hope that we can do more of it.

Now I'm going to talk about hype. So, this is a stock price from a company that starts in the year 2000, peaking quickly at over \$1000, and then

going down to almost zero.. Does anybody know what stock price this is?

Comment: Plug Power.

Speaker 3: Yes. Give that man an award. [LAUGHTER] This is Plug Power. In the year 2000, as those of you who were in the industry then know, the fuel cell was going to take over. Every home was going to have a fuel cell, and Plug Power's stock ran up to almost \$1200 before, in a year or two, collapsing to essentially zero. Now, I could have done the same chart with about the same timeframe with Capstone and the microturbine, because every business was going to have a Capstone microturbine, and Capstone was just going to be the wave of the future.

Now, getting to today (and I know I'm a little bit of a Debbie Downer and a brick in the punch bowl. I prefer not to be called the Antichrist, because I think that's going a little bit too far), [LAUGHTER] here are some things that I've written about (and if you want to read the long play version of my critiques of them, the slide at the end has my website. They're all posted.)

I think micro grids are inherently inefficient, for reasons I won't get into.

I think that the HV direct current transmission lines, the big lines, are almost always inferior to a build out of the existing AC network, for, again, reasons I won't get into.

Grid batteries are not ready for primetime. Let me just give one quick illustration of that. We quote the price of grid batteries typically in terms of X dollars per megawatt of capacity. And that we generally assume that that capacity will be provided for four hours. Now, if you want the grid battery to provide that same capacity for eight hours, the cost per megawatt is doubled. If you want to do it for 12 hours, it's three times as much. Now, if you have a peaking gas unit that costs X dollars per megawatt for capacity for four hours, it's X. If you wanted to do it for eight

hours, it stays X. It doesn't double. If you wanted to do it for 12 hours, it stays X. It doesn't triple. This is, I think, something that really gets lost in the conversations about grid batteries, particularly when we're talking about resilience issues, where the expectation is that whatever we're relying on perhaps should last a little bit longer than four hours. I certainly think 60 days is ridiculous, but that's another issue.

For home batteries, again, I think the economics are not there.

Just one word about the REV (New York's Renewable Energy Vision). REV, in many ways, was premised on this idea that the value of distributed energy resources was going to be LMP plus D. OK. And D was going to be the avoided cost of the distribution system with lots of distributed energy resources. Now, our actual experience has been, if you look at California, that distributed energy resources, and the planning for distributed energy resources, hasn't reduced distribution costs at all. Instead, billions of dollars of rate increases have been proposed in order to accommodate distributed energy resources. So, part of the reason for this thing has been completely undermined by actual experience of what we've seen.

Home solar costs five times as much as grid solar. And yet, California has layered on yet another mandate to require all new home construction to have solar panels, and I'm not going to talk about that any more than to say that. [LAUGHTER] Jim Bushnell has written about that already, and I don't need to say any more.

Offshore wind costs at least two and a half times as much as onshore wind. And we have states in the Mid-Atlantic and New England saying, "Oh, well, we'll get 2,000 megawatts," or, "We'll get 500 megawatts. We'll do this, we'll do that." And there's no analytical basis, as far as I know, for any of these numbers. And I think the situation's actually worse, and it's because of this. I think we ought to measure the misspending in terms of the

relative cost of RECs, because that's the subsidy cost that consumers are going to pay for, that taxpayers are going to pay for. And, basically, if you look at the numbers, like the recent Lawrence Berkeley Lab numbers on the revenue that wind generates onshore and offshore, and you look at the costs from the Lazard LCOE stuff, you can say, "OK, maybe a REC gets a megawatt hour of onshore wind at 10 bucks." An offshore REC costs \$130, based on what Maryland and Delaware got and are going to pay in their procurement. So, the same dollar of REC that you're paying for offshore wind could get you 13 times as much onshore wind. So, why are we doing this? Maybe somebody during the discussion period can explain it to me.

Comment: It's faith-based.

Speaker 3: Faith-based. Yes, thank you. I knew there was an answer.

So, electric cars. I won't talk about that, because no one agrees with me. [LAUGHTER]

There's more in the "don't subsidize" category. New nuclear, that makes no sense even when it's half built. You know. [LAUGHTER] Georgia, this means you. [LAUGHTER] And, by the way, not subsidizing this stuff doesn't mean that coal and nuclear are going to disappear. I mean, EIA is projecting that we're going to have 274 gigawatts of this stuff. It's going to be around 32 years from now. So, this idea that these entire industries are at risk is, I think, not rational.

So, let me talk a little bit about the Trump-Perry bailout. And I know no one's going to disagree... well maybe a few people will have some disagreement, but I just want to make a couple of points, because this has been run into the ground pretty well already. But, grid outages at Department of Defense (DOD) facilities represent eight percent of all the outages at DOD facilities. In other words, the vast bulk of outages at DOD facilities are occurring in the facilities themselves, on the bases themselves. And, of the

eight percent that are sort of grid outages, or external-to-the-base outages, generation resource inadequacy, as a cause, is, as we all know, based on the Rhodium Group data and everything else, it's trivial. And, of course, critical DOD facilities have backup generation.

I'll just go to another slide. [LAUGHTER] OK. Retiring units. In PJM, retiring units are three times less reliable than new units, based on EFORD (Equivalent Forced Outage Rate, demand), which is the industry's standard for reliability. So, the irony of a lot of this is that keeping these clunkers because of a bailout is actually going to reduce grid reliability, because we're going to be keeping the unreliable stuff, which will be keeping out the reliable stuff.

In terms of the legality on the Defense Production Act and the Federal Power Act, I just don't think a fair reading of either of those could possibly justify what's being contemplated, and I'm sure I'm not the only one who's come to that conclusion. I think part of the irony of this, though, is that if Trump and Perry can mandate the purchases with a faux national security claim, imagine what the next president (and I think there will be a next president) could do with a national security claim that's based on sort of a legitimate global warming basis. I mean, for example, mandating the purchase of all existing and future wind and solar generation, and conceivably squeezing out or even ending coal generation. And I think that's the kind of football that we'd be creating. Of course, it would be ironic, and I wouldn't be too unhappy about the outcome, but I hope we don't go down that path.

I want to talk just one bit about the German experience with the Energy Transition there. The German residential rate is now three times the United States residential rate. Three times. It's unbelievable. Meanwhile, for all that pain, their emissions are unresponsive, where U.S. emissions have gone down. And so, in a nutshell, Germany basically substituted coal and expensive renewables for nuclear, whereas, say,

the United States has substituted natural gas and inexpensive renewables for coal. And so, this is what you end up when you have bad energy policy--the German experience.

Now, I want to say some good things. These are things I think are actually good, and I hope we have more of: onshore wind, grid solar, hybrid vehicles, demand response, ideally real-time pricing (I know I'm preaching to the choir on almost all these), energy efficiency...I think one of the most amazing things is that the carbon dioxide emissions reduction from LED lighting is three times that of all the home solar in the United States. I just think that's a staggering fact. It's just attributable to energy efficiency. Gas-fired generation, a carbon tax, if we could ever get there, and more markets and competition. And, of course, the Harvard Electricity Policy Group. So, thank you very much. [LAUGHTER] [APPLAUSE]

Speaker 4.

Thanks. Speaker 5 and I are both delighted to be here. I think people have teed up the issues pretty well. Speaker 1, you're right. What do we want markets to do? How many variables can we solve for? What is legitimate? We've talked about the importance of nuclear, and whether we're willing to pay two or three times for it. I think it's going to be an interesting discussion. Speaker 3 talked about technology. We disagree on this. We don't disagree on much, but we're going to talk a little bit about actually what the changes in technology can and should be able to do.

So, we are just going to do a little bit of history. We're going to talk, because we love to give directions, about what government should do, what regulators should appropriately do, and then some of the challenges and opportunities that we have before us. As I was thinking about this and looking at the history, I thought of a couple of quotations and one is James Joyce, "History is a nightmare from which I'm trying to awake." And then, of course, the one I think we're living and

breathing says that, “Those who fail to learn from history are doomed to repeat it.”

Let’s talk about history. It is a political reality that we have to deal with it, as someone said yesterday. Electricity is a political commodity, but the fact of the matter is that political solutions never really solve economic problems. History is littered with disastrous energy policy decisions. California discovered that with its bad market design and price caps. The 1970 price controls drove investment out of the industry. Biofuel mandates upset the food production chain. There were the windfall profits tax on oil. So, we need to reflect that, while it feels good to politically intervene, it ends up with outcomes, at the end of the day, that do serious damage both to our economy and certainly to the consumers who have to live within that and our environment.

We don’t think we can turn back the clock on the changing economics of energy. There’s no way to avoid it. We don’t think that technology, and the enabling opportunities that creates, both for consumers and for operators, is anything that can be ignored or denied. The medical industry was referenced earlier. If you look at the revolution in the medical industry, in spite of all those special interests and the failure of a national healthcare policy, the fact of the matter is that medical care is changing dramatically, and in large part it’s driven by technology, which is forcing people to do business differently. The changes are also a reflection of changing consumer demand.

So, we talked about whether consumers get value or not, and how they perceive value, and we’ll talk more about it. But, believe me, with the generational shift that we’re seeing, and the new and added opportunities for people to get and act on information, opportunity within the electric community is going to change dramatically as well. So, I think there are lots of positives that we can leverage, should we choose to make the appropriate economic and environmental decisions, as opposed to simply being driven by political decisions and cronyism.

Speaker 5.

First of all I, don’t attend these often, to my regret, but, Bill Hogan, I get to take this opportunity, as the last panelist here, to say what we all feel. You have not only assisted in these markets; you helped form them. And as one who was a regulator in Texas, and we were putting all this together, and you came down on the midnight before we were ready to flip the switch on our new design and you said, “Wait. You can’t do zonal, you’ve got to do nodal.” We said “Damn it. We’ve got stakeholder consensus on zonal, we’re going hell bent to zonal.” We did it, but it cost us some money. You were right then; you’re right now. You came to our assistance (rescue, maybe) many times at FERC when we were putting together not only the standard market design, but those market designs that were right there before us, that we were looking at. And you and the team here have done a lot, I would say that it eclipses the contribution anywhere else in our country. So, there’s a lot to celebrate here.

It’s under attack, but things that are under attack are things that work. And the only reason that we’re talking about bailing out old plants is because competition works to make the plants that don’t need to be bailed out so strong and efficient. So, thanks to you for that.

To the moderator, thanks to you, from when I was a little puppy, watching this stuff from law school, and as an early lawyer watching Congress put this all together. And I was lucky and honored to work with Betsy’s colleague, Jerry Langdon, back at FERC in the days when I drank the 636 Kool-Aid, [LAUGHTER] and to then watch Betsy take that Kool-Aid and pour it into a lemonade cup, over there in the electric industry, and give that to all of us to drink, and it’s just been a phenomenal thing, seeing that individual people matter, and I’m so pleased to be in the room with so many that have done so and gotten us here.

You mentioned that a third of our economy is not subject to competition. And it’s the parts that we

spend so much time talking about: government, healthcare, and education. A lot of the things that people perceive as being wrong in our country, or not working as well as they should be in the country, are that way because the influence of markets and competition are not there. I don't know if they could ever be there. I'm not good and deep and smart enough to think about what to do there. I live in the healthcare world, and Houston has a huge healthcare industry, but you just look at the difference between how people talk over dinner about energy company stuff in Houston, and how your doctor buddies and your healthcare and hospital buddies talk about their industry over lunch--it's like the U.S. versus Russia back in the time of the Apollo-Soyuz project. You finally find a way to talk together about that joint little hatch that connects those two space capsules, but you've got two totally different worlds working.

So, I'm glad to be on the side of the one that's actually out in the market working. Ugly and lumpy though it's been getting there, I do think that, ultimately, we have to get there. I think it was Speaker 1 that said, having goals is important. It's critical. You've got to know what you're doing, otherwise just saying, "We want competition because it's supposed to work," that's just like the house built on sand. We're not going to ever get there.

The goals that I was told by a man that became the 43rd President of the U.S., were pretty clear, as he was wont to be: better price, better service, technological innovation. At the end of that conversation, Bush told me, "The utilities that you're going to regulate worry more about what we think [pointing to himself and the House and the Senate of Texas] than what their customers think. And that's wrong. And you're going to change that." So, that was really a customer-centric vision that I think fundamentally needs to be what all this discussion is about. How does it play out for the customer? I understand there was a good, robust discussion yesterday about how it may be playing out, good or bad, in parts of the

country, but at the end of the day that's the whole point. And I think we're not doing that, probably, in healthcare and education well enough—thinking about who the end users are there and what kind of services we want to deliver.

But in this industry, for this person, at least, who was involved at both the state and the federal level, that's what we were told. That's what I was told, from my boss, who defended me for those 10 years, on what we were trying to do. That's why we were doing it. Better price, better service, technological innovation, and the role of government. Should government be doing something that a business can do?

So, as a regulator (and I think I summarize what we all have lived), the regulator's role has evolved, over that period of time, from setting the prices and the cost of service model and calculating what that was supposed to be, then moving to the question, what is something valued at? So, in other words, the value of the service that a market would deliver, that transition from looking at the cost-plus model to looking at the question, what is the value? Sometimes the value is more than it costs, and sometimes the value, for at least a short term, is less than what it costs.

The role of a regulator is and will continue to be what I've always called the three-legged stool. Is there sufficient infrastructure? Obviously, when we came to FERC, we discovered, in California, there was not.

Second, are there balanced market rules? Those were also missing in that market, as well, but it was true across the United States, and that's a judgment call. I see fellow regulators around the audience here, and obviously tuning that balance is tough, because you've got very passionate advocates for customers, and very passionate deep-pocket advocates for the people you regulate, and then you've got the people that want to compete with them, and then the environmental groups and others who care a lot about what goes on. Trying to hit that balance

point is obviously hard to do, but, to articulate the goal of a regulator, then, now, and in the future that goal includes how to hit the balance of market rules.

And then, obviously, markets do not self-police. I would like to think, as a Republican, that they do, but I learned, as a realist, that they don't. And vigilant market oversight is called for and must be a vital part of that system, and so, that's the third leg of the stool that I think has been wobbly in the past, but I think, both under Democrat and Republican FERCs, at least since we were there, that's been relatively a robust leg on that stool.

Speaker 4 and I were talking last night and this morning about the role of regulators, and we came up with some things that regulators should do, and I think Speaker 4's slides are in the deck, so you all can look at those, but one of the things that we wanted to articulate here that I don't think has been put on the table, is the role that regulators play in economic development. I mean, fundamentally, my job as a Texas regulator and as a national regulator was, what can we do to improve the foundational part of the economy that is the energy industry? And I don't forgive legislatures in Illinois, New York and New Jersey for their crimes against the economy, but I do understand them. [LAUGHTER] I do understand that, really, they are looking at the economic development of a small subset of the nation, as is their wont and is their right. And they are thinking about that. Unfortunately, they're viewing that salvation of an old job as opposed to the uplift of all the new jobs that could obviously be a big part of the future.

Back to competition, one of the lessons I learned from inside the industry is, where does the value come from in competition? So, let's think about it, let's kind of throw that piece of data out there, too. After looking through all these data, and from the inside, living it, I tried to figure out why did my 10 cent rate in Texas in 2001, under regulation, drop to 7-1/2 cents this year for a 100 percent renewable contract? Even though the gas

price has gone up, actually, from 2000 to 2018. The gas price went from about two dollars to about \$2.50 in that time, so the input price of fuel has actually gone up. But my rate went down by about a fourth (in real dollars, not in inflation-adjusted dollars.) There are three buckets. Operational efficiency is one. During my time in the industry, we bought plants from other companies, and the low hanging fruit was so low you could just bat it off there with a kid's baseball bat. It was amazing how much in the way of operational efficiencies you could wring out. Again, when it comes to people who kept the lights on for a hundred years, you're not going to kick them in the face, but you can surely improve on that aspect with the plants we inherited and the ones that we bought.

Managing risk is also important. When utilities can pass that cost through and really not worry about the risk, because the risk is managed on the back of the customer that's captive, that's a very different mindset than if you've got to bear that risk as a company. And so, those types of things are wholesale market savings that we see in every state, not just in the retail open states like Texas.

Another big bucket is, who pays for reserves? The reserve margin used to be included in every rate payer's rates. You put 15 percent extra of generation capacity on the back of every regulated retail customer, and that's how it was done. In the competitive market in Texas, a market that does not have a capacity component to it, that risk is borne by Dynegy, TXU, NRG, the co-ops, the generation cities, and others. That's borne by them. The cities pass that through, because they're still vertically-integrated in Texas, and they're allowed to do that. But in the competitive market, that big batch of dollars (and that's a substantial amount of money in the reserve margin) is being borne by the market. They're all hoping to get it paid back this summer, with the tight market expected in Texas. And I hope they do get it paid back, so that the market model will validate, but at some level that's as it should be.

The big victory of competition was to put the risk on the back of competitive players who were paid to manage risk, as opposed to putting it on the back of all of us, who just have paid a regulated rate for the last 100 years. So, that victory needs to be obtained, and when we do things like adopt capacity markets, we kind of turn that dial from 100 percent risk being borne by the market back toward the old model of 100 percent being borne by the customers. Capacity markets are kind of a rheostat. That puts that in the middle, and there's a lot of good thought on that. But nonetheless, the third part is the margin. And when I heard someone mention on the radio recently that they really would like there to be an 18 percent margin be granted in the rates that are set under the new bailout statute (and I think I've seen corresponding things from others), you go, 18 percent? I mean, at my former company, we were thrilled to get three.

And so you sit there and go, "Well, where did the savings come from?" Well that's three big buckets: operational efficiencies, managing risk, and the reserves. Who pays for those? Customers or somebody else. And margin. What kind of margin does a competitive market have, versus a regulator?

So, that ties me back into what the regulator's role, going forward, is, as the stuff that's going to continue to be regulated, which is T&D, wires, administration of these energy efficiency programs (which I think should not be handled by a regulated entity)...for that kind of thing, those regulators have got a hard job to do to keep those costs down. Grid modernization, for example, to me, as a regulator just screams, rate base increase. You used to be able to gold plate in the rate base, now, generation, and in some states retail, have gotten deregulated, but that big generation was a great place to do the cost add. I just now got into the wires business and I've got to milk the hell out of that to get returns. So, a big role for regulators in the transition world, going forward,

is making sure that that type of investment is adding value, not costs.

We heard yesterday about the potential for transmission costs to be competed down. I don't see distribution being competed down, but I do see it being, probably, gutted out, particularly in the Sunbelt.

I've always amazed at Speaker 3's brain, because it's so smart and he does such good work...but you're such a damn technophobe! I was reading that thing, and I thought, "Damn. How did he get to that?" I'd love to engage on that, because I think the point of this panel is to lean forward into what the future's going to be. I never would have dreamed this. I mean, when I was a student at Texas A&M, I remember the big thing, for the telephone, was, we had MCI "friends and family." And you basically did their marketing for them. Their customer acquisition cost was pretty low, if they could promise you a cheaper rate. At 11pm, the rate went from 11 cents down to 2 cents for a minute of long distance. (Of course, now they give it to you for free.) I remember my friend in the room next to me. He had a girlfriend down at University of Texas, Mary, who he ended up marrying, but, God, we lived through every part of that rollercoaster. [LAUGHTER] At 11:00 at night, about when I was starting to kind of dial it down and put my homework up, "Mary, I didn't cheat on you darling." [LAUGHTER] They are still happily married. I did find him at a reunion, so it was nice to know that Doug and Mary are happy in Austin somewhere.

But that was the earliest days of this, and look what happened. I mean, now, I can get on an airplane, move money around my bank accounts, learn how to speak a foreign language, and babysit my kid on a plane with something that, back then, the only game in town was getting that 11 cent down to two cents, so Doug could call Mary at, on a cheap rate and have a 45, 50 minute conversation right through that supposedly brick wall that was right next to my bed.

But the role of the regulator is to get barriers to entry pushed out of the way. And, the batch of regulators that we all have been running around with, we've been pretty good at that over the years. And I would say that support from our legislators and Congress have been great in that regard, but getting barriers to entry out of the way is what allowed wind to have a seat at the table, and then, a few years later, solar to have a seat at the table. And, probably, going on right now, what will allow storage to have a seat at the table.

So, those were on the technophobic list 10 years ago. They're going to be the center of the list, going forward, because when you get people a seat at the table, and you don't tip the scale, which I'm afraid regulators and legislators have been tempted to do a little bit more. We've seen even my wonderful Governor doing that. Who would have thought, of all people, that he would be the avatar for ripping markets apart? It breaks my heart, but I'll take that up with him later.

The last thing I want to say about the role of the regulator is about the quarantining of the monopoly. So, you think about where innovation can come from. I generally do not want to put the future of innovation and the energy industry on the back of the most conservative part of that industry, and the electric power regulated industry is the most conservative part of the industry, in the energy cycle, of all. And they've been that way on purpose. We wanted to keep the lights on. We wanted to keep everything going, in the traditional model, for the last 100 years, but I do not think, if we care about technological advancement, that we need to do anything other than keep that monopoly function small, keep its cost down to the value of what the customers want, and keep it quarantined, so that the innovation can happen around the corner. I look at things like block chain coming this way, where you even take all the financial middlemen and the ISO settlement people possibly out of the function, here. That, and those kinds of innovations, don't happen if you have a

monopolist there kind of protecting the old way of doing things. So, if regulators do anything, and I love that Speaker 1 started with that, it's thinking about the ways to put themselves out of a job. I think that's not exactly how Speaker 1 said it, but I think that if that's what regulators are constantly compelled to do by their overseers and the legislatures and the Congress, than that could be, I think, a helpful role going forward.

Speaker 4: Regulators need to rethink their jobs. They're very different now, and we didn't talk about consumer education. We talked about it a little bit yesterday. People don't ask for things they don't even know about, unless it's an iPhone, so I think the job for all of us, particularly at the state and federal level, is to explain in a better way, one that people can actually understand, what it is they're paying for. In that case, I think you're going to have a very different attitude. We need to forget Stalinist control; it's not working. The states need to really work on a regional basis, and Speaker 1 has been an incredible leader in the West. They're not going to replicate what we did, but this is not the time for a food fight between states, or between the states and the Feds. There's too much at stake.

And just a little bit about technology. Go to the CenterPoint control room. They have digitized, from new meters right up to the control room. Their storm recovery was done in half the time and at half the cost it would have been before. Look at Direct Energy and some of the sensors they're offering for asset management. And really look at a new study by Tufts, which talked to a number of CEOs, almost all of whom said, "We want green energy. We want new technology. We want better information." Because, at the end of the day, the data that is provided by a lot of these new technologies is going to allow, as I said earlier, both operators and consumers to respond in a more meaningful and, frankly, economically and environmentally responsible way.

General discussion.

Question 1. First of all, this has been a fantastic discussion. It's hard when you've got a six person panel to actually make it lively and interesting, and get a lot of laughs, and you guys hit it out of the park. So, thank you.

What I wanted to do is tee off a little bit on the agenda title here. I think we've had a phenomenal look back, with some previews of what's to come, but I want to have folks break out the cloudy, cracked crystal balls and really look forward. In that, despite the remarkable, I think, cost efficiency gains that we've seen in these markets over the last 20 years, we're in another one of the two or three existential crisis that we've seen in the markets over the years. And we've seen, across the markets, persistent push, at the state level, on getting back into resource planning and owning that a little bit more. We're now seeing a push, whether it's DOE, or we've got an example here in ISO New England, towards holding resources for reliability for different types of reasons from what have traditionally been those types of RMR type arrangements. And, to the degree we've gotten any clarity from the courts and Congress (by its inaction), it's a general comfort with the muddled nature of a lot of the jurisdictional battles, and that seems to persist.

So, if the situation is going to persist into the future, what's our path forward? Are we looking at inevitably ending up focusing on the energy and balance elements of the market, the day one elements of the markets, with resource planning going back to being a bit of a muddled mix between the states and ISO's? Does that then lead to a meeting of the ends of the spectrum, where the organized markets start looking like a lot of the efforts that Speaker 1 is leading in the West, or is it picking up on where Speaker 6 was going with technology? Is that our way out? Do we have a technology utopia, where there's an ability for an individual consumer to have the empowerment of using a platform to access a competitive market, and do we transition to that?

So, given the extraordinary history and knowledge and intelligence on the panel, where are we going?

Respondent 1: Two thoughts. New England is a unique case, and it is the one place in the country where I'm worried. To focus on PJM, and try to fix stuff because of First Energy's bankruptcy, and to upend a big market that's working, I think, very well, is ridiculous. But I think the resiliency focus is very appropriate here in New England. I love this place, but you do have some unique issues. Bringing things in over the wire versus bringing them in by pipe is the classic debate we've had everywhere, but these debates ultimately get resolved, because somebody puts money down. But here, we're still playing the standoff game that was being played when we were at FERC. And we're now a decade and a half later, still talking about that, here in New England. So, I don't have a good answer. I do want to think more about it. I'm hoping that people on this panel have better ones for you up here in New England than I did just now.

In the end, the freedom wins. And so, we freed ourselves from localized energy based on wood fires, and all that stuff, to a market that we all joined together and got voltage up to kind of keep that plug on the wall, the 60 Hz and 120 volt, and now we're opening that up, much as we opened the telephone market up so I could get away from the 11:00 phone call. All that kind of stuff has happened, and will continue to happen.

So, the road's going to be circuitous and rough. We're going to have retrenchment eras, like what we're doing now. We're in the age where the marginal cost of electricity is less than the average cost, which should be nirvana for retail competition, and certainly for wholesale competition. But yet we're seeing rates in regulated states go up. This should be the time of glory for that, but we're oddly in this retrenchment, because of what you point out, as we have gotten away from the big picture, which is focusing on customers and what customers

want. And if customers want whatever they want, then we ought to let them have it. And so, we ought to structure a system that allows that sort of freedom to happen. It will win out, but we just want to make sure that the thing doesn't get disjointed by a bad experience in New England next winter. And to my fellow panelist, what do you think we should do up here?

Respondent 2: Well, you've got to build a pipeline, when you're two days away from freezing people to death. It needs political courage, but, to answer your question, there's a whole bunch of things. I think the stakeholder process is broken. That's well known. The inmates are running the asylum. As our moderator pointed out, you've got too many vested interests. I think regulators have to get back to making the tough decisions. It's not a popularity contest. You have to listen. You have to balance.

I think what we haven't discussed, and should, is what the advent of data is going to do for us. Yesterday we talked about inadequacies in planning. I think PJM does an OK job, but, again, what are we asking people to do? How do we validate it? Data is coming from many places. We need to make sure that people who need to have access to that get that data, and it's not only an issue of the privacy nonsense that's going on, but it's also an issue of making decisions. So, regulators need better data. We need kind of a national monitoring system. I look at a product that's being sold by a company that's selling to a utility to provide information for their industrial customers in California. And the industrial customers are only getting about half of the information that this product provides, because the utility wants to keep the rest, and then offer them the solutions. That's just wrong. So, I think we need to really focus on driving information to all levels of the marketplace, because I think it's going to illustrate the inefficiencies of this kind of endless battle.

Look, the states have authority, and I get it. God knows, I live the dream, but the reality is, having individual states do integrated planning without recognizing the regional nature of markets and the opportunities Speaker 1 identified is very, very costly. And we need to externalize that information.

Respondent 3: My fear is that we are only in the middle of a protracted period during which issues are going to be coming in on an *ad hoc*, case by case basis, and FERC is going to be largely reacting to how those issues wind up getting teed up, as opposed to stepping back and taking a broader picture perspective. I think that the times when you've seen real progress happen in the industry have been when you've had leadership there with a fairly clear vision, I credit Pat Brown and Nora Brownell and Betsy Moler all as being examples of that sort of driving effort, where FERC is leading the process actively, rather than just mostly being reactive. I think the jury's still out with respect to how things are going to go, going forward. But I think that until we get into an environment like that, we're going to continue to, frankly, stumble forward. I do think we will be moving forward, but stumbling along.

I don't think you're going to get leadership from Congress on this. Ultimately, it's going to come down to FERC. Nature abhors a vacuum, and someone's going to step in to fill the void. I think what we're seeing is that the states, basically, are stepping up to the plate on that issue. And that is only exacerbating some of the issues that we're talking about.

So, I actually think that's what's really going to be called for before there's any sense...and people are going to disagree about the issues, and not everyone's going to like, necessarily, the direction that you're going to go, but right now, I'm not sure what direction we're going. So, I hate to be Debby Downer, part two, [LAUGHTER] but that's kind of how I see things going, and it's we're in the middle of it, I think,

and I think that's probably, for some period of time, how it's going to go.

Respondent 4: I agree with much of what's been said, specifically with respect to New England and their problems obtaining a reliable source of gas supply. I was at the New England conference of PUCs a few weeks back, and heard, for the first time, this guy who I'd always been told is kind of a little crazy, Paul LePage, the Governor of Maine, speak, and he gave the most lucid presentation about the need to obtain reliable natural gas supplies in New England, and I'm like, "Wow. Everything I thought is proven to be wrong at this moment."

New England's a special case. There is eventually a feedback loop, because if you believe, as I do, that a lot of these state actions raise the cost of energy well above what a competitive equilibrium would result in, and retail regulated rates are the dumping ground for the cost of those policies, ultimately, it will engender a political reaction.

And you're seeing it in Nevada. I mean, Nevada's large customers are so sick of paying for retail regulated rates that are the dumping grounds of these policies that they are financing a ballot measure (which I think is crazy, by the way) to ask voters to amend their state Constitution. I just want to put on the record that I don't think that's the way good policy tends to get made. But it's entirely conceivable that they will just blow up the monopoly by constitutional amendment, because of their dissatisfaction with the cost of these policies. And that's going to happen more and more.

It's also the case (and this is where technology disruption comes in) that if you have technologies that allow people to sort of disintermediate the retail rate dumping ground of costs and the wholesale price, that is, to really commit a kind of regulatory arbitrage around it, you don't need those technologies even to be particularly good to have them be social welfare increasing

phenomena. In other words, you can agree with Speaker 3, even while thinking these technologies will have a truly disruptive effect that causes retail rates not to be a viable way of incorporating these public policies.

So, I would just say, I think that the future is unwritten, but there will be a political consequence down the road if state legislatures raise the cost of electricity too high. They've been enormously lucky that natural gas is so low priced, because it's given them the headroom to tinker around with this without real political consequences thus far.

Question 2: I also want to thank everyone for such a great presentation and a great couple of days. Apropos Speaker 3's comments, I'm going to steal and repurpose a Conan O'Brien joke, which I think he himself stole. Which is, people say the traditional grid is obsolete. I don't believe it, and neither does my blacksmith. [LAUGHTER] So, I think in that joke Speaker 3 is the blacksmith.

But my question is a good follow up on Speaker 1's comments, and I especially appreciated you pointing out that the thing that was disruptive about the MCI technology was that it was microwave. And if you look back, especially at telecom (and I love looking at telecom, because the thing that ultimately killed the POTS, the plain old telephone service monopoly, was intermodal competition. I think it was cable, and, believe it or not, we are a very short T ride from the site of the first cable overbuild in the United States, which was in Somerville, Massachusetts. So, not even cable is a natural monopoly, but it was cable, it was wireless, it was satellite...and so, I see things that look like that at the distribution level, and it's interesting that several panelists have sort of said, "Well, yeah, but not distribution. Well, maybe we'll do this over here, but not in distribution." And if you define distribution as the traditional view of what distribution is, if you're talking about wires and poles, then, yes, maybe that's a natural

monopoly, but if you think of it as the service, then my question is, is it really a natural monopoly, and if it's not, which parts of the system perhaps are subject to competition, and do we have a regulatory structure that's even open to the possibility of allowing that kind of intermodal competition to really have the effects that it might have, come what may, on the distribution system?

Respondent 1: Thanks. Let me just preface this by just sort of maybe invoking The Animals. Lord, don't let me be misunderstood. [LAUGHTER] I'm not a technophobe, and I certainly expect technology to continue to be an extremely important part of our business, going forward. And I think there are a lot of ways to skin a cat, and I certainly agree that distributed energy resources can play an important part in the mix, going forward.

My fundamental concern, however, is with cross subsidies--subsidies, which inherently are cross subsidies, right? Because a subsidy has to come from somebody else, so I don't think of a subsidy that's not a cross subsidy. So that's what concerns me, and subsidies come in so many different forms, and the layers of subsidies can tend to exacerbate the situations. The term "net metering" hasn't been used yet this morning. But I think net metering is a form of subsidy. Net metering means getting distribution and storage services essentially for free. And then the next thing you know, we have to build out the distribution system to accommodate this form of DER.

So, I just wish we would price everything as well as we can. We know we're not going to a carbon tax, at least not anytime soon, so we have all these second-best solutions we have to use. I have no opposition to RECs, because I think that's a relatively efficient way to do it. But I just think that if we don't spend our subsidy dollars wisely, we're sort of shooting ourselves in the foot, because we could be accomplishing our same ends with much less money, if we spent the subsidy money more efficiently. So, I don't know

if that's in response to your question, but those are some thoughts I had. Thank you.

Respondent 2: From a legal point of view, obviously, back in the day, you had sort of the street car industry that, ultimately, went completely out of business, and there were a series of legal cases where these street car monopolies said, "Well you've got to make us whole. Raise the rates for the remaining customers," and it proved to be unsustainable. And when those people lost their monopoly and lost their arguments about stranded costs, it was because a new technology had completely supplanted them, essentially. I just don't think it's going to happen here. I mean, the great division problem which is at the heart of retail rate making, which is the revenue requirement divided by volumes, can tolerate a good deal of fluctuation in the denominator, without breaking apart utterly. And I agree with Respondent 1 that I don't see that happening, even though I do think you'll see some of the features of retail rate making be traumatized by technological disruption.

Questioner: Is there some chance, though, that the numerator could get a lot smaller?

Respondent 2: Yes. I agree with that.

Question 3: So, I too am very grateful for this panel. I have a broad question, which I don't know the answer to, and it is, what do I tell my students as a takeaway from this panel? Let me formulate what I would characterize as problems. So, we at the Kennedy School, teaching our students and think about public policy, we've always made the point that you couldn't just look at the end of the spectrum, where you've got the analytical, economic, whatever it is, argument right, and you've ignored the politics. You have to think about the institutional and the political consequences. We also, I think still (although I'm never sure about this) tell our students that it's not just all politics. It's not just, you win, I lose, and we trade back and forth, and so forth. So, there's

a middle ground here that we're trying to find, where we're balancing these two things, and I think the examples we've had here in the last couple of days illustrate that.

So, the distinction between wholesale and retail is a little artificial, but we accept that, because that's the political institutional structure, and we try to get the wholesale thing right first, and so, that's very much in the middle ground here, as opposed to going to either one of these extremes. And there's this very British notion of muddling through, which I like.

So, let me cite two examples that illustrate the problem that I'm worried about here. And the first one is the discussion, which we mentioned a little bit here, which was Order 888 and the conclusions from the FERC on that. And if you read that document, it has a very careful and very candid discussion of the pros and cons, in terms of, "We could do this, we could do that, we have to worry about these transmission rights, we don't quite know about this available transmission capacity, and we need different ways to think about that problem." And, to this day, I tell my students to go back and read that, what they said, up to about page 40, where they were explaining all of this, and I said, "They got it right." And so, they explain what the problem was, and they were quite candid about that, and then you turn the page and it says, "But we don't quite know what to do. So, this is hard, and so we're going to have open access and we're not going to adopt these fancy transmission models. We're just going to say, tell us your available transmission capacity and you have to file something," and so on. The same day, the same organization issued the capacity reservation Notice of Proposed Rulemaking. What did the first paragraph of that document say? It said, "We're thinking about redoing the thing we just issued this morning, because of this problem that we identified in that document that we don't know exactly what we do about it, and we're going to have a conversation about that." So, that became Order 2000, and

there were all the other kinds of things that came along with it.

But, in Order 888, there was a candid discussion of what the problem was. I wasn't happy with the decision that they made in Order 888; I would have gone further, but, nonetheless, they said what they were doing and then they started this process and then that led to other things, and I view that as success. So, the discussion includes things like, that's where it's complicated, there are a lot of tradeoffs, but we're being candid about what we're doing, and we're saying it, and we keep trying to be energetic in pursuing that and finding out what the story is.

The other end of the spectrum, I would characterize as my view of the discussion yesterday about Order 1000--which is doublespeak. So, you say things which, when we put the words together, it doesn't make any sense. I talked about the two elephants in the room yesterday--about these things that are just not true and that we keep saying, and we keep repeating them, because we want to get a particular outcome. We've got to fuzz it over and cloud it up and say things which are not true. And I think that's unstable and dangerous, and I hate it, and it makes me crazy, OK. [LAUGHTER]

But I don't really know how to resolve that dilemma between these two things. And what do I tell my students? Frankly, what do I tell myself? I mean, I know what I'm going to do. I'm hopeless and beyond reform. But, when you're talking to people, and you say, "It's not this end of the space, it's not just all politics. On the other hand, it's not just all economic analysis. There's this balance in between," how do we think about that, and how do we protect ourselves from doublespeak, which I think is dangerous to the polity as a whole, versus muddling through, which is necessary? And you have to go through this kind of process, and you can't avoid it. I don't know the answer.

Respondent 1: I agree. I guess I tried to introduce a Straussian esotericism briefly in my discussion, which probably has more of a place in like Harvey Mansfield's class than in HEPG, here, but I will say that as you introduce new, more subjective variables that you need to solve for, other than least-cost and reliable (and reliability is already subjective enough), you invite more of this kind of doublespeak trend, where real policy intentions are announced only *sotto voce* and concealed under a technical veneer. And that, I think, is just innately the case when you make utility regulation more complex, and when people are not really willing to be forthright about what they're wanting out of electricity policy. Because what they really might want is just local jobs for the union, but that's unacceptable politically, it's unacceptable in constitutional law, and it's antithetical to some of the other goals you're asking the markets to sell for. So, I think a fair reading is that it is inevitably becoming more political, more subjective, and less analytically rigorous on the economic side, because you're asking utility regulators and RTO tariffs to be Captain Planet, and not just save you a buck or two.

Respondent 2: I have the same struggle. My course ends with the question, how do we manage ambiguity and uncertainty in science, as well as in politics and economics? And I don't have that figured out yet. But, I would say, go back to what we want to push for in the institutions, which is to at least, like at the regulatory agency, try to force an honest conversation in which people will be exposed for their doublethink, and in which there are opportunities for others to challenge, and to bring in the analysis, and whatnot. In a political presidential campaign, you're not going to have that. We don't have that kind of discipline. And while we'd like to have more honest conversation, that's the Wild West. But in Congress, when it's operating by its regular order and using the hearing process correctly, it does a better job than a campaign. But where we really want to have the discussion is in the courtroom and in the regulatory arena, where we have the

opportunity to have more knowledgeable people to begin with. We have an opportunity to keep the conversation on topic, as long as they don't have to deal with every trivial thing in the world, and that's what we ought to be striving for--to reinforce those institutional values as part of the solution.

I also happen to believe that one of the driving needs of most human beings is for what one of my professors calls "psychic certainty." You really want to know what that future looks like. And, by the way, people have gone to the Delphi Oracle for that. They've gone to astronomers for that, and now, today, they go to modelers for that. [LAUGHTER] And I'm all for the analytical and the intellectual effort in modeling, because that helps to force us to think about things. But, you make a big mistake if you put your faith in the model to tell you, on climate, on energy, on anything else, 25 years from now, what the world will look like. It can tell us what it *might* look like. It can show us different alternatives to what it might look like.

But just be careful you don't become so arrogant that you know for sure. That's why we have markets, because they figure things out that we can't, as intellectuals or planners, actually ever totally know. What I do think is important is to try to reinforce what our expectations are, and what we expect from the various institutions we have, and, to be honest with you, force them to think through again, how to make them effective.

Respondent 3: I think that the distrust and disenfranchisement of vast parts of this country from those who make the decisions has tremendously been exacerbated. And I'm not just talking about from the White House, but I just think you look at every institution, from the Post Office to the Catholic Church, just getting decimated by just bad history and bad decisions, and I just think that that kind of common ground that existed as recently as when Betsy and her team were doing 888...Now, even objective facts are being called into question in the arenas where

you never dreamed that would happen. I haven't seen that quite so much here, but I have seen a lot of misinformation, much more than we had even during standard market design. The amount just doubled, at least, or tripled.

So, that environment within which you have to make those decisions and articulate goals, is a much different one, and very constrained. I think that when you have got so much lack of trust from the governed of the elite (which would, honestly, be people in this room, and regulators, and policy makers and state and federal capitols) to make decisions, you have got to shrink down your goal. And so, I would suggest that the goal of this enterprise, from the very beginning, was a modest one: allocative efficiency and productive efficiency right? Those were the two. Let's get pots of dollars that are being left on the ground in the existing system. Let's capture those, and then, as policymakers, decide how, between customers and providers, you allocate those benefits. Now, that's kind of a one-time game, but it goes on every year. So, I mean, you get dollars, and you reallocate those back.

I don't know that you can get consensus beyond that. I mean, you might get a consensus that will preserve a job here in Illinois, or that we need to put offshore wind here in New England, or on some of these little party favor things that go on around the edge and that don't wreck the full agenda. You can probably move modest parts of the agenda, but I just think that this era doesn't allow for that grand vision right now. Because nobody has consensus about what institution has credibility to do it, and what facts are out there that we can all agree upon. It's sad, but hopefully this will recede, and we'll ride forth and get back to a place where we trust institutions. I don't know that we will recede back to the place where everybody trusts that people in this room are going to design the perfect system.

Respondent 2: But I would just say, this is the enormous value of HEPG and other learning networks in a policy area. It is the one hope we

have that some people can stay focused on some issues that actually might get some kind of consensus, even though they won't agree, and that can therefore intervene in the political process at the regulator. Then, what I think you can only hope for is that you've got some regulators that have the intelligence and the will to help engage, and you have, in Congress and the state legislature, at least a few champions. I do think one should not lose sight of the enormous value of this institution and others like it, although this is, to me, the preeminent one in this field, and it has had an impact.

Question 4: Thanks. It's been invaluable here at HEPG. And, in fact, let me paraphrase one of the opening lines from the first Star Wars movie. "Help us, Professor Hogan, you're our only hope." [LAUGHTER]

So, actually, this is one of the best panels I've heard in all the years that I've come to HEPG. I'm going to take a slightly different tack here. If we think about the history here, how did we get here? Speaker 4 invoked George Santayana as saying, "Those who do not learn history are doomed to repeat it." How did we get here?

PURPA. Let's go back to 1978 and PURPA. Let's start picking winners and losers. Let's start predicting the future. And where did that lead? It led to really high prices, and long-term contracts that we couldn't get out of. Which led to, "Oh my God, I don't want to pay this." To Speaker 1's point, there was a dumping ground for that, and that was in electricity rates to customers. They didn't want to pay that. So, they're trying to get direct access. Which leads us to competition. And now here we are, coming full circle. I think we've all lived long enough now to see how this movie has played out before. Now we come full circle. Now we have RPS, which is just PURPA with a smiley face. And net metering is along the same lines. And we're going back there.

But the three big things I think about with competitive markets that we've seen historically

are, first, innovation. I think everyone's alluded to innovation. Second, risk. Shifting of risk to those who can best bear it. The third thing, here (this goes back to predicting the future) is that markets help us exploit the real option to wait for better information before making irreversible decisions like building a nuclear unit that's going to be 300 percent over budget or an IGCC plant that's just never going to go into service, or is going to be so far out of the money, as we saw in Indiana with Edwardsport.

Even before power markets and gas markets, we have a great example, environmental markets. If we think about ZECs and RECs and everything else, the problem we're trying to solve is an environmental problem, inherently. Why did we lose faith in environmental markets? Everybody remembers, with the 1990 Clean Air Act amendments, all the talk about, "Oh, my God, prices are going to go up. It's going to be too costly to meet the sulphur dioxide targets," and everything else. And a funny thing happened along the way--innovation. The cost for compliance came down. People realized they could blend low sulphur coal with high sulphur coal with minimal problems. The cost of scrubbers came down. People realized they could actually buy and sell allowances. Southern Company was the poster child for this, and really did very well in reducing costs by engaging in these different types of strategies. And yet, we've lost faith in that. Why have we lost faith in that, is one of the questions. Why did we lose faith in markets, when we've shown the innovation and we've shown that costs have come down? And why did we lose faith, especially, in environmental markets, because now we seem to want to avoid this? "Oh, God, we can't put a price on emissions. People will see it. My God, prices will go up."

So, then the other question is, how do we actually get people to understand that it's not necessarily the price, but it's the total bill? California has high electricity prices. Overall, total bills are actually relatively small. I've got the worst of

both worlds. I have high prices, and I have to use a lot of electricity to keep cool in Florida. But how do we get people to see those differences?

And then the other question is, Speaker 3, you brought up all of the technologies, and looking like a technophobe, which I don't believe you are. Nor are you the Antichrist. [LAUGHTER] But the question is, what are the technologies that we haven't even thought of that are going to come along the pike? If we start picking winners and losers with RPSes and with the policy that's been promulgated by the Administration, which is total insanity....So, what are those next innovations? How do you convince people, using the historical examples that we know are out there, that markets are the best way to go? How do we get there? Why did we lose faith in markets to begin with? This is the problem that I struggle with, because the empirical evidence seems so very clear to us. How do we get back there to those halcyon days when Betsy was running the Commission, and we got Order 888? How do we get back to that? Because the past does point us to the future, in some ways.

Respondent 1: Can I just throw out something we haven't talked about? (Though it's been alluded to). That's how the politics of special interests have overcome the economic realities of markets. So, you have the mature industry that is struggling against all kinds of externalities--whether they be technology changes, whether they be rate exhaustion, whether they be political--for a business model that is probably not sustainable in the long term. I would argue that one roll regulators can play is to begin to identify the glide path to get them from here to there. But you have those special interest forces who are dominating the debate, who are really struggling--and look, they're vital to our economy, so it should not be winners and losers in these situations, but that's what it's come down to. That's what you're fighting against, in a political era that unfortunately is fact-free. So, that's one of the reasons I call for regulators and policymakers and people in this room to do a

better job. Put your own special interest aside, and start talking about those facts. And start informing your customers, so they can be part of the discussion with their own representatives.

I think, at this point, we have to accept the reality that it's not unlike the healthcare debate with the Clintons. You have got so many special interests who have bought their way into a Congress that just doesn't work. So, we're going to have to kind of continue, unfortunately, this incremental improvement until it becomes clear, as I feel absolutely certain it will (and Speaker 1 has already identified it) that you're hiding a whole lot of stuff in rates, and you can't hide forever. You can't be uneconomic forever. There's a price to pay in every aspect.

Respondent 2: I'm somewhat optimistic, it turns out, about technology, in part because I think there are enormous financial resources that are out there to support technology in all industries, including ours, and I think that the power of the tech giants to raise funds, and the way in which people value those companies...Elon Musk has shown, whatever I may think about electric vehicles and subsidies for electric vehicles, that he could raise virtually unlimited sums of money for products that he's offering and proposes to offer in our industry, whether it be solar tiles for roofs, or power walls--all of those things. So, I think, going back to what one of the other panelists said, that there are a couple of basic ways of looking at how to support technology, which are, first, to reduce barriers to entry to the greatest extent possible, and, second, to quarantine the monopoly to the greatest extent possible. I think those are great phrases. I think that as long as we were doing those things, we're enabling technology, where it makes sense to do so, to enter and play an important role in our industry, going forward.

Question 5: I want to put a little bit of finer point on timing. This is an incredible, rock star panel, and it gives us the past and the present, and I've been trying to weave together the academic and

the practical. We celebrate the Caps winning today, many of us, and I think back to how many years I waited for the Cubs to win--so optimism does pay off, eventually. But we suffered through, I can tell you, many losing, dismal, frustrating seasons, and so, while I share the optimism that eventually economics and technology will rule, I fear we're about to go into that sort of period of time of dark and losing and frustrating seasons.

And I agree with the earlier comment on the importance of leadership, and it's sad that there isn't leadership with a clear vision today. There's leadership with a different vision than what many of the people in this room rallied around. So, when you have DOE officials publicly saying, "This is a natural monopoly," and invoking cyber security to undo markets, it's not a lack of leadership or of vision, it's just a different one. And I'm surprised we haven't heard about the Defense Production Act publicly in this room this morning, because what's happened in New Jersey is what could happen if those Orders are issued by our President soon. You're going to have half the market reserved for inflexible resources, and almost all the rest reserved for intermittent resources, and that doesn't work.

So, my question is, what is the survival kit, over the next few dark and losing seasons? I mean, "muddling" isn't very satisfactory to people who have real money in the market, who actually believe that this was the vision that the Feds and the states wanted us to implement. How do we get through the next couple of losing seasons, and then get to the time when we can hoist the Cup, or win the World Series, on all the good things people think will happen?

Respondent 1: I would just remind you that the first effort, the 90 day supply directive to FERC, FERC rejected. The second one, the Defense Production Act, may happen, but it also may turn out to be that it can't get through the courts, and it can't get through even the bureaucracy to figure out which plants are really vital to the national

security and make some kind of crazy defense about that. I think it's all absurd, but the point is, there's lots of this stuff for which it is hard to know what's real and is likely to happen, whether it's good or not.

Question 6: My question to the panel involves reconciling some of the comments that we heard with the fact that CO2 emissions, that cost, is still an externality in the marketplace. And so, Speaker 1, you talked about the importance of markets driving us to the least-cost result for reliable power, and I think everyone appreciates that if you have markets and competitive forces and you have people competing on the basis of cost, you're going to sort out the least-cost suppliers, and if you don't have enough market revenues, then you're going to close down, and that a bailout would be paying somebody to run that can't make it in an efficient market.

But we're not counting all the costs when we've got competition in the marketplace today, because we're not counting the cost of CO2 emissions. And so, one panelist said that PJM seems to be a well-functioning market, but in PJM, we've got some states that include some CO2 costs, and other states that don't. So, you've got people competing against each other, some of whom are counting the costs; some of whom are not. And then you've got mandates for subsidized renewables that have shifted costs, and now we've got negative prices as a result. If we had a \$43 a ton social cost of carbon charge internalized in PJM, the price would be \$17 a megawatt higher, when gas is setting the price. Now, that's in a market where the average price is \$29 a megawatt hour. So, when we look at nuclear plants, and Speaker 3 uses the term bailout for keeping nuclear plants in PJM running, in a market that's not counting all the costs... How do you reconcile using terms like "bailout" and, "the market's working fine," with what I think is a major distortion, because we're not counting all the costs?

Respondent 1: Well, I do believe the carbon tax is the most efficient way to resolve these issues, and I think what we've seen in the form of RECs and RPSes and production tax credits are second-best solutions that have been developed to try to get at this problem, given that the gold standard of a carbon tax doesn't seem to be realizable from a political perspective. And we have to be realistic about the politics. I think that, when it comes to nuclear plants, only a fraction of nuclear plants are at risk of closing under current economic conditions. And those are the ones that are the most inefficient, the oldest, and the least reliable. They tend to be the single unit ones, and I think one could make a case for ZECs or some other form of support for them, but I think, on balance, it's a mistaken path, and we are trying to get rid of subsidies across the board, including the production tax credit, for example, which is phasing out. And I just think we're far better off going down that path, than trying to add more and more band aids, to where the whole enterprise collapses.

Respondent 2: As I recall the debate, certainly in New Jersey and in Connecticut, those plants were actually making money--maybe not making 18 percent, but they were making money. So, I agree with what Respondent 1 just said. If you value this stuff, it certainly would be done, at a minimum, over a regional basis, and preferably over national basis.

But, you know, we do deal with the fact that different states have different sales tax rates all the time. So, you can have a national market in the sale of diapers or of iPhones, and know that in Texas you're going to pay eight percent sales tax, and here in Mass, you would pay five. Yes, you can differentiate stuff according to state preferences as to how they want to allocate dollars between and among large players, but, ideally, I do think you would want to have a national type of approach there. But, again, not at the cost of perpetuating the subsidy, when we're finally at the point where we can bend the curve down on the renewable subsidies. The infant

industry has grown up. The infant is now shaving, so we can put those things away. And I think there are probably some lingering subsidies for coal and gas that the renewable guys always bring up, too. Those are probably at least tamped down by the tax code changes last year. Let's just get it over with, not perpetuate it. I do sense that that day's got to come sooner, rather than perpetuate it with continuing programs.

Respondent 3: So, my opening comment is Amen to the questioner's comments. We have been working for years towards market-oriented solutions like a price on carbon, to no avail. And the answer back is, "It's not politically feasible, so we just put it off to the side. We're not going to deal with it." On the other hand, when you look at the politics from the state side, that's when everybody gets all up in arms over it.

We believe in markets. We have been trying to push for a market-oriented solution to this for years. And the discussion just keeps going on and on and on. We're at the point now where, yes, the units are making money today, but we can see what's coming down the road, and the responsible thing is to deal with it now, rather than wait until you get to the point where these plants are shutting down, and then you have no choice, because they're not going to come back one they're shut down. So, it's that mix that we're trying to deal with right now.

I think the biggest issue right now is the need for greater clarity on the role between the states and the federal government in this issue. Part of the complication is that we have a bifurcated system, where we have both the states and the federal government working together. I think that the dynamics has been shifting over time, as these markets become more regional and more nationalized. That's only complicated the issues. So, I do think one area where it would be very helpful if we could get congressional action or decisions from the courts to provide clarity, is, where's the dividing line between the

responsibilities of the federal government and the state governments?

Respondent 4: Not to unduly complicate the conversation, but I think it's an open question, too, whether the recent state legislative activity that's predicated on log rolling and the kind of doublespeak I've spoken to earlier, takes political pressure off of the market-based approach. In other words, by passing these laws, are we making it less and less likely that a first or second best solution is ever achieved? The answer's probably yes.

Respondent 5: First of all, I don't think that a carbon tax is politically impossible. It takes some political courage and some real leadership, and we missed a grand opportunity to politically and economically do it in this last session. When you are transforming the tax code, and you are giving out something to people, it's a lot easier to take something away from them and be able to come back and say, "Well, I know you got a carbon tax, and you don't like that, but I had to vote for the carbon tax, which I didn't really want, in order to cut taxes on your corporation or on your income or on your social security." Now, this is the political bargain that could have been had, and if there were any kind of serious leadership on climate, and serious leadership... These opportunities may come again, but let's stop making excuses that, "Oh, I don't have to be a political leader; I don't have to have courage in Congress; I don't have to have courage as a regulator." Let's be honest about it. You also have to have some people with some guts in these positions, who will make some decisions. I'm not pretending I had all the guts. I'm just saying, I want somebody else now to have them. [LAUGHTER]

Respondent 4: I think you just said it better than I could have. I guess I'm worried that we're all a bit complicit in a form of gaslighting when we take "resiliency" at face value and treat it as a thing, rather than kind of the type of doublespeak that's covering for a level of not-normal

borderline kleptocracy. I think Speaker 3 has done a great job articulating it in articles, but I think politicians, public service commissioners, FERC commissioners, and FERC staff need to be more honest about what's going on, and need to be explicit about it, if we want to change what I think a lot of people in this room think is really a not-normal type of policy discussion that's going on.

Respondent 6: Thanks, everyone, for your too-kind comments. I want to make a plea to everyone in this room. This Trump-Perry rule making. Resilience...whatever clothing it's dressed up in, get active. Get involved. File comments. I'm sure they're hell-bent to go ahead. At least, I'm reasonably sure of that, because that's the nature of these people. But, having sat through the appeals of Order 888, including at the Supreme Court, rulemaking comments matter. So, gang, let's go for it.

Question 6: I have to say something that's a little bit heretical in this room. It's very fashionable to bash PURPA, but I think it did play a role in opening up the closed utility system, and maybe we wouldn't all be sitting here, having these discussions, if not for those initial breaks in the utility armor. And then, I appreciate, Speaker 3, that you came somewhat to the defense of RPS laws, and that RECs, in theory, should be somewhat complimentary to the inner state markets, and not necessarily too damaging, anyway.

The point I want to make is actually about intermodal competition versus business competition, or sort of business plan competition, business model competition. I don't think there is intermodal competition right now. It's really just about business model competition and different ownership models and the efficiencies that those bring out, and I wonder, how do we make that same breakthrough at the distribution level? It's not necessarily about replacing utility, but there are all sorts of business models that simply aren't allowed, because the utility will come and say

that I'm infringing on their franchise, or something like that, and, in 25 years, are those barriers still there? How do we break down those barriers?

Question 7: I appreciate Speaker 3's comment that the Philips decision was a very bad energy policy, and I'm wondering, how are we going to avoid having every DER resource treated as a public utility regulated by FERC, and also having the distribution-level service for that resource to reach the grid regulated by FERC? IS there any way to avoid that outcome?

Question 8: As with many things in life, it comes down to leadership, and the difference between campaigning and governing. I mean, those of us who run for office--you say a lot of crazy things when you're out on the stump. [LAUGHTER] And then you ask your regulator to execute on it. And as is often the case, you get an incoming call from a legislator who wants you to do X, and it's a horrible idea. Now, are you going to say to that person, "I know you think that's a great idea, but we're not going to do that." Or, do you go along? Do you fold? And I think part of what you're teaching the kids here is the distinction between politics and governing and the role that regulators play in being informed, technically sophisticated, having knowledge of the industry, and, to some degree, being believers in markets.

Moderator: I'll let our panelists, if they want to make one last comment or respond to a couple of these questions, have at it.

Respondent 1: There's so much to say. To the last questioner, obviously, I agree. I mean, in all my career, I had a lot of incomings, and you have to appreciate the need to dodge and weave, even to the point where another commissioner would come down looking at me like this, because of some kind of cave I did to somebody on the Hill for this or that, but you just kind of have got to recognize that to save the broader agenda, you have got to make compromises along the way. And some leaders are more effective at that than

others. I've got my report card grader here and I never did higher than a C on that, but --

Respondent 2: Not true, not true.

Respondent 1: But I think you have to do that. We're in a stage now when you've got large political players, and to wail about it is stupid. It's just the way it is. We're not a corrupt banana republic yet, but we're a country where big players have...as long as there's a lot of transparency, and you know that FirstEnergy wants to keep its plants alive, and their person came up to me and said, "We've got to look people in the face and shut their plant," and I said, "I had to do the same thing at Dynegy. When Exxon got the bailout for their nukes, I had to shut down coal plants," and now Curt Morgan at Vistra has to deal with that. But it's a zero sum game if you want to play that game of coal versus nuke.

The bigger picture is that that is the world we live So, we can whine about it, but I think the better thing is to keep our eye on the long-term ball, and make sure we accommodate and listen to interests, because, a lot of time, if you listen...I thought I knew the answer, day one, on the Texas Commission. We're going to do it this way. Bush told me slow down, listen to everybody, go to Houston Light and Power's boardroom, which is the ground zero for PURPA... I love PURPA, because that created the Houston ship channel, with all that self-gen, and people go, "Oh, that's not a monopoly anymore." I went to the home ground of that, and asked those people, what do they need? What do they really have to have? When you're there, when you listen and have those kind of conversations--and this is a forum where that kind of conversation has been enabled for a quarter century. So, again, thank you for that. That's where you can find those one plus one equals three solutions, and get from where we are, in the *Empire Strikes Back* day. *The Return of the Jedi* is coming out soon. [LAUGHTER] But it will come out, because people are trying to accommodate, not just fight positional tug of war,

but trying to identify where I can maximize someone's good a little bit, if I handle this a different way. He won't be thrilled, but he'll be happy. Those kind of things just require bright people, and I've been blessed to be surrounded by so many bright people in my career. And I think there are a lot of them in this room. I'm optimistic, because it's worked for 25 years, that in 25 years we'll be looking back and going, "What a halcyon era we lived in." It's just not real halcyon today. [LAUGHTER]

Respondent 2: Two words. Stay engaged. We're overwhelmed with bad information. We're overwhelmed with bad decisions. It's hard to know where to stick a finger in the eye. This is critical. Again, we have to set aside our own vested interest and just say no and say it loud.

Respondent 3: I will say, since no one is here, really, to defend it, perhaps, that elections do have consequences. It's sort of a smug pronouncement, but Trump needs to do something for his constituencies in Pennsylvania, Ohio, and the Rust Belt. And he's giving them steel tariffs, and he's doing this, and he might get it done. Maybe he won't, maybe he will, but at the end of the day, he might just have to take your licks on it, and then it will have, no doubt, a political reaction that brings, probably, us back to where we had been.

Respondent 4: Well, I just wanted to say, queuing off on what the last questioner said, in my lowest moments, when I was serving in Congress and trying to figure out what social value we had (and most the time I thought we belonged there and should be there), I realized that, in many ways, Congress is a great prophylactic. It is amazing what it prevents happening. You can't believe all the bad ideas that are brought to the Congress. So, let me just say, in defense of Congress, not because, in its wisdom, it was rejecting all the bad ideas, but because it couldn't get it done, fortunately. And the founding fathers did not make it easy to make strong federal coherent policy, and a massive country is now a massive

economy, in which there are serious differences of values.

One of the previous questioners got to the issue that I'm compelled about at the moment, and that's climate change. I'm all for, and have been for a long time, competitive markets, but that is not the highest value. I'd rather have a market solution. But, I think, when you actually look at it, as E.E. Schattschneider (a political scientist when my generation was in college and it seemed like the country was going to hell in a handbasket, with Vietnam and disobedience in the country, and all kinds of things that were not going well) said, "You have to look over a 30 year period, and what you begin to realize is that enormous progress actually gets made." And in fact, progress gets made because of many people in this room.

It's remarkable, the change in this industry. It has transformed in many ways. We do not have totally competitive markets all across the country. We do have high-value competition. We do have high-value innovation in technology. All of these things also create problems, so I'm much more optimistic, only because it's an act of faith on my part. Some of you have more specific knowledge. But I do want to just re-emphasize and close, since it's the 25th anniversary, with just really high praise for Bill and for Ashley and for this mechanism that they created. They may not have anticipated how important it was going to be. But I don't think there's any question, it has had a major role in helping people learn. Business people had to learn. Regulators had to learn, because most people didn't have any real solid answers, and it's a developmental thing. Knowledge and science and all of this is always a developing proposition. And thanks for all your great work.