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COMPETITION POLICY IN PERSPECTIVE

SESSION 2

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P R O C E E D I N G S

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MR. SEESEL: Good morning and welcome to the second day of the Federal Trade Commission's Conference on Energy Markets in the 21st Century, Competition Policy and Perspective. I'm John Seesel, the FTC's Associate General Counsel For Energy, and I want to welcome our audience here at the Conference Center in Washington, as well as everyone watching the conference on our web cast.

We are going to start off today with a discussion of the transportation sector, past, present and future. I'm very pleased to welcome as moderator of this panel Clifford Winston, a senior fellow in economic studies at the Brookings Institution.

He will be joined by Terry Penney, the technology manager for FreedomCAR and vehicle technologies at the National Renewable Energy Laboratory; John Felmy, the chief economist of the American Petroleum Institute; Samantha Slater, the director of congressional and regulatory affairs at the Renewable Fuels Association, and David Austin, an economist in the microeconomic studies division of the Congressional Budget Office.

Cliff?

MR. WINSTON: Good morning, everyone, thank you.

So, this session is concerned with the goals of trying to improve fuel efficiency, reduce vehicle use, or VMT as we call it, and reduce congestion. Good luck.

So, the way we'll proceed is that each of our presenters will have 15 minutes. We could have questions of clarification, I think, after that, if you don't want to wait the whole time. So, if you have any questions just clarifying what people said, you can ask them then.

Please introduce yourself every time you ask a question so the person who is taking notes will know who you are. Following that, we'll have general discussion and comments following up on some of your clarification questions.

So, for the speakers, after 14 minutes I'll let you know you have a minute left, and then you'll finish in that minute, with probability one.

So, we will begin with our first speaker is Terry Penney from National Renewable Energy Laboratory.

Terry?

MR. PENNEY: Thanks. Thanks so much.

The challenge that we have in front of us with the vehicles and fuels for the future is daunting. If you haven't been to a refinery, I would encourage you to

go out there. Let us look at the problem. I will be kind of setting the stage for what has happened in the past, and kind of looking forward in a crystal ball, and then looking at some of the solutions that we might have on both the fuels side as well as the vehicles side.

If you look at the growth globally, both from a historic point of view and going forward, this slide by Exxon/Mobil here shows that transportation really dominates the sector, and emerging is Asia and China, in particular, the growth of vehicles in that part of the country, I think it's a train coming that most people are not aware of.

In the United States, the same sort of trend happens here. The growth in light trucks, sport utilities mostly, is still projected to increase, although I would expect that that's going to dampen off as we see crossover vehicles, but many of the vehicles today are classified as light trucks, like a PT Cruiser, it is a light truck, as opposed to a car.

Notice that if we're looking at 12, 14 million barrels a day growing to 20, there is a significant gap, and again, cars and light trucks make up that majority. Heavy trucks increases slightly, but it basically is about a third of the sector. And then this is another same graph of the previous data, just from a pie chart

showing that light duty vehicles make up about two-thirds of the market, as we have said.

This is the projection for the rapid growth in vehicles by numbers. This is in VMT, vehicle miles. Highway vehicles in millions of vehicles, and the growth is going to be tremendous, and China is going to overtake us in a few years, and right now they are at about seven million vehicles a year, I believe, and if you start cranking out 10, 15 million vehicles a year, pretty soon they will have 240 million vehicles, just like U.S. has. That's going to put a tremendous pressure on the use of gasoline, if gasoline is, in fact, the choice of those vehicles.

So, people have said, and there's a lot of debate, as to whether or not peak oil will happen and when it will happen, but if you look at the price, if you look at the vehicle miles traveled and the millions of barrels of the gap that I was talking about, we are certainly in the mode of a perfect storm brewing.

We have done some numbers, and there has been some talk about increases in CAFE, one of the papers outside elegantly talks about the cost of a CAFE increase versus the cost of a gasoline tax. You should pick up that paper if you have not read it. If you look at these equations in terms of millions of barrels, or

vehicle miles traveled, it's a very stiff equation. It takes a lot to do anything to move that curve of oil use for the vehicle population as we know it.

So, if there is one theme that I would like to get across in this opening presentation is that there is no one option that is going to dominate, you are going to have many different options in both conventional vehicles, they are going to be with us for a long time that I see in the future. Hybrids are just starting to come on, we see that growing.

Farther out might be plug-in hybrids, if the battery technology matures, and then the long-term, and long-term can be 20 years, 50 years, some people think it is shorter, could be even the hydrogen vehicle in a hydrogen economy.

Notice the fuels on the fuels side, we have, again, a portfolio of fuels, both the conventional gasoline and diesel, as well as some of the bio fuels that we're hearing in the news today. The National Labs got together and looked at pathways of both fuel switching and energy efficient pathways and opportunities, and we basically said, well, if you look at the fuels, you can have carbon fuels, hydrogen and/or electricity as a prime means for feeding those vehicles, and each has their particular opportunities, benefits

and challenges. If we convert biomass, we have to worry about that efficient conversion process and the feedstock, what the feedstock is, the availability of the feedstock, the cost of the feedstock and the enzymes to break that feedstock down.

If we go a carbon-based fuel, we are going to also worry about carbon sequestration and how to do that, validate it, and integrating with a gasification process. Hydrogen has its challenges, mostly the infrastructure costs and how we make that hydrogen is also being looked at, and stored and compressed in vehicles.

And then, finally, the renewable option, you can go electricity, and you can make hydrogen under our carbon fuels through renewables. Then, of course, the electricity has its challenges, I said earlier about the energy storage device, namely high energy and high power batteries.

If I put my crystal ball on and look at the near term, what is going to happen in the 2010 to 2015 time frame, we're going to have activities both in fuel switching in those areas that I just talked about, as well as vehicle efficiency in both propulsion options as well as vehicle systems, and I will talk a little bit more about kind of one or two that I see coming on in

the near term.

In the long term, 2030 to 2050, I see a greater activity in the bio fuels area, especially with cellulosic ethanol moving away certainly from corn, and then, again, electricity, and then perhaps even hydrogen.

If you look at cellulosic ethanol, and NREL is working, we probably have 50 to 100 people working on this area, we are concentrating mostly on the cellulose area, and what we have looked at is the hard woods, the grasses, crop residues to break down that cellulose in these ratios that you see here.

Now, I throw this out probably more controversial than just to make people think is today we have about 77 percent gasoline and 21 percent diesel. Could we, in fact, move to what kind of mix on the right-hand side of that equation, does that pie look like, and I throw this out just to make you think about the electric side of the equation, will we move back to electric vehicles and/or plug-in hybrids, and that's what I would like to spend a few minutes on.

If we look at -- hmm, the little box didn't show up. The little blue oval there shows on the X axis the oil saving potential, the Y axis greenhouse gas reduction. When we get together and look at all the

options for incremental changes that the vehicle manufacturers are probably going to make, we see that maybe up to 20 percent and maybe about 30 percent oil savings could result from those advanced vehicle or propulsion technology options.

To really go beyond, we are going to have to have a leap in the 2030 to 2050 time, and we see from the analysis and the technology options the larger red oval there, showing between 30 and 70, 80 percent improvement, as well as oil savings up to 90 percent.

Let's talk about plug-in hybrids. I think most people know what a hybrid vehicle is these days. A plug-in hybrid is just more batteries, as we see it, larger battery, larger format, probably a different chemistry, most likely lithium. These batteries right now are expensive, they are unproven in their reliability lifetime, and certainly the infrastructure is a little bit easier than hydrogen infrastructure changes that need to go on, but most houses are wired with a plug that one might be able to plug in their hybrid vehicle.

We find that the plug-in has many different options, whether it is an all-electric range, with the first 20 miles, we sometimes refer to it as PHEV 20 or PHEV 40, the 40 being 40 miles electric, or 20 miles

electric, and there's a real education that needs to go on that doesn't mean you're going to drive the first 20 miles electric, it could be an integrated strategy where the engine comes on for increased torque at low speeds to get the vehicle mass moving, and then it shuts off. The challenges with that is whether when you are trying to make a SULEV, the super ultra low emission vehicle, that switches the catalyst on and off and we're not sure whether or not the emissions are going to remain low when your operation strategy is like that.

If I look at three curves here, I would like to focus on the blue curve, which is what we notice as hybrids today. There's mile hybrids and full hybrids, and it has a potential, and this is a per vehicle cumulative of fuel savings, over time, it's not anything with regard to penetration, this is just one vehicle versus another vehicle, and how much oil it might save.

The pink area is the path of plug-in hybrids, and then finally the green line there shows the introduction of fuel cells starting in 2020, and then it has a higher slope, which means it's a greater potential for per vehicle fuel savings, but since the technology is delayed, it shows that perhaps we could save on a national basis going the route of plug-in hybrids would save more for the nation than hybrids or fuel cells.

So, if you look at that red path, it basically says, we are on the hybrid path right now, in the blue portion, we expect that plug-in hybrids will be available in a couple of years should that battery technology be overcome successfully by the OEMs, and then perhaps fuel cells in the long term.

One thing about the plug-ins is there is a natural business case that utilities like the fact that a vehicle might, in fact, bring up that nighttime load for charging. Of course, it would exasperate the problem if these vehicles all plugged in during peak charging time, and then of course we have to worry about how is that electricity being generated, whether that is from coal or hydro or renewable, as a matter of fact.

One of the studies that we did at NREL is how plug-in technologies would really help wind technology, wind take-off, when wind competes head-on with everything else, it goes to a certain level of penetration, but when you add plug-ins for that nighttime load, wind energy actually increased by quite a bit.

The other little aspect that I might want to indicate there is that if you look at this is low duration curve, and there are a few hours where the utility has to size for that annual peak, and the red

oval there, as indicated, would it not be interesting if these vehicles, these plug-in vehicles, were V2G, vehicle to grid, and two-way communication such that the battery on board could actually get back to the utility and one could be compensated for that energy flow in a reverse direction.

Some of the utilities are looking at this because the sizing and the cost of that annual peak is very expensive to them, and regulation charges what they call in the utility industry would be very interesting if thousands of these vehicles would come on.

Of course, this is many, many years in the future, because we have to get plug-ins before we get V2G.

We took a random sample, if this was 227 vehicles in St. Louis, we modeled them as they got their straight gas mileage on average, 26 miles per gallon. We then said, if you hybridize all of that vehicle population, what would that do in terms of fuel savings, and that's the red curve, which shows 37 miles per gallon. Then what we said is, how much energy would be a PHEV 20, that drops it down to 58 miles per gallon and 140 watt hours per mile of electricity.

It is inappropriate for people to be talking about plug-in hybrids getting over 100 miles per gallon

or large numbers of miles per gallon without actually adding the energy cost of the electricity that recharges those batteries. So, that's why we always show miles per gallon, plus watt hours per mile.

Now, the last one is PHEV 40, and it shows that it gets 76 plus 211 watt hours per mile.

The operating cost you'll see over there goes down from nine cents per mile on a conventional vehicle all the way to 40 percent lower, which is five cents.

Last slide here is to leave you with a thought that there is no one answer that it is going to be a portfolio. This is the technology on the top, vehicle technology, you are going to see them all. You'll see that early on electric vehicles off ramped, but we see them coming back on, perhaps, and in the future, plug-in hybrids, neighbor electric vehicles, fuel cell vehicles, and on the fuel side, we see an option of certainly no one answer is going to solve this.

Thank you.

MR. WINSTON: Thank you. Perfect. All right, excellent.

Any clarifying questions just at this point? Yeah, in the back, please, and introduce yourself.

AUDIENCE MEMBER: Hi, my name is Archin Burrell [phonetic], I'm with the FTC Bureau of Economics. Just

a quick question. The curve that you showed with projected use vehicle I believe you said it was, projected energy use, with different CAFE standards, was that just based on comparative statics or was that based on some sort of adaptation by consumers to higher prices?

MR. PENNEY: No, that was just a straight calculation what if there were an imposition on the OEMs of increase of CAFE by 10 percent, 20 percent, 30 percent, what would that do to the overall vehicle use.

AUDIENCE MEMBER: Okay, great.

MR. WINSTON: Any other clarifying questions?

(No response.)

MR. WINSTON: Okay. So, we'll now turn to our next presentation, from John Felmy, chief economist at the American Petroleum Institute.

MR. FELMY: Thanks very much, I appreciate the opportunity to be here. The next few decades are going to be very exciting in terms of what technologies, what fuels, what vehicles, things like that that are going to come forward. It is probably one of the most exciting times in terms of looking at opportunities and going forward, and so we appreciate the opportunity to talk about it.

But that being said, I think that if you look

certainly at the size of the vehicle stock that we have out there, the changes required in terms of vehicle manufacturing, look at everything that is going forward, we are still going to see for the next few decades the good-old reliable internal combustion engine as being a key factor going forward.

It may use a different mixture of fuel, but it is going to be around with us for quite a while, and if it is nothing more than it takes a long time to retire that fleet that we have out there, even if we suddenly were to switch forward to a whole new host of vehicles.

It is also important to think about the future of vehicles and fuels and so on in the context of what consumers want, because while we can talk a lot about consumers wanting fuel economy and improved emissions and things like that, that cold 6:00 a.m. morning when you go out to start your car, the most important thing that you are interested in is that the car starts, that it has heat, and that it gets you where you are going. Then, beyond that, of course, these other issues are important to consumers, but one has to put it in the proper context.

It is also key going forward that when we talk about what the future will be, is to not overpromise. We have had unfortunate problems in the past where

technologies such as some of the original diesels were rushed forward, they had huge problems, and they effectively really soured the consumer for a few decades.

So, whatever we do going forward, we have got to keep this in mind, or else no matter how good the technology is, no matter how superior in emissions and so on, it simply will not get consumer acceptance and you will not make progress.

Now, what I would like to do, since most of what I do is educational, I am going to turn to something that I give in every presentation I give, and it is only vaguely related to the discussion right now, but I'm going to do it none the same. The biggest problem we face in the oil industry right now is that everybody knows the price of gasoline but nobody knows what goes into it. So, just a quick primmer in terms of some things on that.

For example, the top two lines are diesel fuel and gasoline prices, the bottom line is crude prices in dollars per gallon, and just for reference, yesterday crude oil was at $61.89 a barrel, 42 gallons in a barrel, so that works out to a little over $1.47 a gallon for crude. Taxes in this country are roughly 46 cents. So, those are some key factors that consumers

need to take into account when you are going forward and looking at what is actually the cost of fuel, and what goes into it.

Now, let me also turn to another issue that we face in terms of dealing with consumers. Research suggests that if you talk to consumers about what they think about emissions, you will find that most believe they are actually going up. And of course that is not true.

Even though you have seen vehicles increase by 40 percent, miles driven by 80 percent, you have these criteria pollutants drop by this amount. And that is important to keep in context, because if you look at just the simple research, people will say they do not believe it.

Now, this is a chart that says, where do we use energy, in terms of transportation, residential, commercial, industrial, and so on, using EIA's forecast, because we don't forecast at American Petroleum Institute because of antitrust concerns, this is who uses it. If you look at it in a different perspective, what is used? Of course 40 percent is petroleum, 23 percent natural gas, 23 percent coal, eight nuclear and six other, including renewables.

So, if you look at the transportation share of

it, you see that in 2005, it was roughly 28 percent, and that's projected to grow into the future to 31 percent.

Then if you further break down the transportation by mode, and this is a slide similar to what Terry went through, you can see that the dominant share is light duty vehicles, and based on the current forecasts from EIA, it is expected to continue that way.

Freight trucks will increase some, air about constant in terms of market share, and the other ones are pretty close. And that is important, because as you go forward, you need to understand that focusing on emissions and so on, the key big nugget that you have got to work on is light duty vehicles. And with over 220, 230 million vehicles out there, they will be around for a while, given the high average age of those vehicles.

If you look at fuel that is consumed by that, it is also important. If you look at total growth between 2005 and 2030, you are seeing a significant growth, and the bulk of that will indeed be gasoline increases. You will see distillate, which is diesel fuel for transportation, and then a somewhat growing role, although very small in terms of the small numbers you see there on the right of the bar charts, but still, barring significant changes, gasoline is again one of

the focus you need to turn to.

Now, let me turn to ethanol, because that is of course one of the fuels that is being discussed heavily right now. As is noted in the slide, oil companies are a leading user of it. They are using billions of gallons of it in gasoline. If you buy gasoline here in this area, you are probably buying gasoline with 10 percent ethanol. We are going see the growth in gasoline, at least at a minimum use of ethanol from five billion gallons up to seven and a half under the current renewable fuels standard. There's an opportunity for more growth for that beyond the mandate, depending on what the market conditions are.

Right now, for example, we are seeing that ethanol with the subsidy included is cheaper than gasoline, and so it provides an incentive for blenders to be able to use more of it, and that is a good outcome in terms of market conditions that move us forward in terms of that.

If you look at DOE's forecast for 2030, they are projecting of up to 900,000 barrels a day of ethanol use in gasoline, so that is significantly above the current level, we're talking about in excess of 300,000 barrels a day.

We've got to remember that there are limits in

terms of corn-based ethanol, and we again like to repeat this because I think it is a case that not a lot of consumers realize what this is, that if you used 100 percent of the corn crop, which is about 10.7 billion bushels of corn last year, according to the USDA, with a conversion of 2.8 gallons per bushel, you are basically only able to supply using corn-based ethanol about 15 percent of the gasoline pool.

Now, of course, going forward, USDA is forecasting growth in corn production from around 10.7 billion bushels up to 14.1, so it is a sizeable increase, due to both increased planning and also increased yields, but you still do not get anywhere near into the levels of ethanol use that is talked about in terms of some of the release in numbers that people are talking about in terms of in excess of 30 billion gallons.

The reason why you have to be concerned about corn use is, of course, this is where corn goes right now, 50 percent of it is in food feed, whether it be beef, pork, poultry or milk. You have got, for example, egg costs are going up, corn prices have doubled, high fructose corn syrup going into sodas and baking and so on has increased in cost, and that's with only about 19 percent of the corn going into fuel-based ethanol.

I think USDA is forecasting something like 27 percent of the corn crop could go this year, so that is a sizeable increase. So, there are limits in terms of what impacts you could have by dramatically increasing this source. It can have an important impact on food. Most of the estimates that we see are that the maximum amount of corn-based ethanol that you can get is somewhere in the 12 to 15 billion gallons, so that is a sizeable amount, and can be blended in the existing E-10 gasoline pool.

If we start talking beyond blending at 10 percent, we get into the discussions about E-85, where you are using 85 percent ethanol, 15 percent gasoline. One has to look at this with a bit of caution in terms of questions about how that will actually be accomplished. First of all, going beyond the E-10 level, you're going to need a lot more vehicles out there to be able to use that amount in terms of E-85 flexible fuel vehicles, right now with only about six million vehicles out there that fit that category.

You are going to have to have more infrastructure, and that is a very costly infrastructure, particularly discussing it at the retail gas station levels. Most of those retail stations are owned by small businessmen, imposing a burden on them of

tens of thousands of dollars when there is not a market there right now is of major concern to the industry.

And finally, where is that ethanol going to come from? As was discussed earlier, the cellulosic ethanol presents a tremendous opportunity. I think we are probably closer than we have been before with the development of nanotechnology and biotech improvements and so on, but until we see the first huge or large commercial operation producing cellulosic ethanol in large amounts, we don't know the timeline for rolling out that technology, and so one has to be cautious.

You also have a host of other infrastructure issues dealing with cellulosic ethanol, because right now corn-based ethanol, you largely have a movement of ethanol from the midwest to consumption centers. If you move to cellulose, you have got a much different distribution system, you are going to need much different infrastructure, whether it be rail lines or the whole processing and shipping of the raw material, and so on, so it is a huge change in terms of infrastructure moving to that.

Let me close just a quick two slides. This basically lays out that if you want to improve emissions at cost, there are trade-offs that you have to look at. We have a gasoline internal combustion engine that you

see where it is in reference right now. You can see improvements in terms of hybrid technology. You could also see improvements in terms of emissions with fuel cells, but you have higher cost issues. If you move to creating, for example, hydrogen with renewable sources or nuclear sources, you do get very low emissions levels, but even higher costs.

So, the marketplace going forward, we think, will sort this out, and when you marry that with what consumers are actually going to be willing to use, that will be the winner in the technologies of the future.

So, I will sum up with just some key points. Consumer acceptance is a key aspect. We are likely to see evolutionary change in terms of this kind of whole host of things that can happen. We need to take into account environmental and social consequences, because, you know, right now, there is a lot we do not know about some of these new technologies in fuels and so on in terms of environment, and just as we learned from introductions of ones in the past, and we really do need a cooperative work between all the stakeholders, and we in the oil and natural gas industry are committed to working with all of the stakeholders, so that we satisfy our customers. Ultimately that is the only way we will all succeed in terms of this evolution.

I will stop, and thank you very much.

MR. WINSTON: Any clarifying questions? Two, okay, you and then -- please say your name.

AUDIENCE MEMBER: Tom Orvald. You mentioned earlier in your presentation that contrary to popular perception, the emissions have actually gone down from vehicles, and I was wondering what caused the emissions to go down. Is that catalytic converters or --

MR. FELMY: It is improvement in efficiency, improvement in technologies, catalytic converters are a proponent of it. The fuels themselves are much lower emitting in the sense of the components of it. For example, we have dramatically lowered the sulfur content of gasoline, the sulfur content of fuels, so it's a marriage of the technology along with the fuels and efficiency improvements.

AUDIENCE MEMBER: Yeah, David Rosenberg, I am a retired chemical engineer who is married to a farmer's daughter and a Prius owner, which brings up the question, in that when they switched from NTBE to ethanol in Houston, I expected about a three percent drop in fuel efficiency and I got a 10 percent drop in fuel efficiency. And I have had a really good test driving a couple of hundred miles with gasoline that I purchased in Houston, that had ethanol, and then buying

gasoline at the destination, which contained no ethanol, and sure enough, saw a 10 percent difference in the gas mileage, like 48 miles per gallon one direction, 43 miles per gallon in the other direction. I was wondering if any of you have heard of anything like that or is it just my Prius that does not like ethanol.

MR. FELMY: Well, the key is that you have got 30 percent less BTUs in ethanol.

AUDIENCE MEMBER: I know, so I should get a three percent drop with 10 percent ethanol, I get a 10 percent drop, which means that I am not getting anything out of the ethanol.

MR. FELMY: Well, that is surprising.

AUDIENCE MEMBER: That is what surprised me.

MR. FELMY: Well, I have seen anecdotal evidence of larger than expected drops of use of E-85 in FFVs, too. So, I am not a chemist, you are far more skilled at that than I am, but it comes down to just a simple BTU calculation, but performance comes into play, and I cannot give you any other insight other than that.

MR. WINSTON: John?

MR. SEESEL: Hi, I am John Seesel with the FTC, I just have a short question with Dr. Felmy, and I may be anticipating something our next speaker is going to talk about, but one of the stories that you see quite a

bit is about contractual restrictions on the ability of gasoline retailers to place E-85 pumps under the canopy or in sort of convenient locations with other gasoline pumps. Can you just describe briefly some of the business reasons that API may be aware of for those restrictions?

MR. FELMY: Well, first of all, I do not know how many restrictions there actually are. There are a lot of assertions about that, that is up to the individual company. I cannot give you a real detailed estimate.

The concern about placing an E-85 pump under the canopy is one of potential damage to the consumer who does not realize that their vehicle might not be able to use it. In other words, the pumps are the same, if you pull up and you have a non-flex fuel vehicle and you put in E-85, you could have serious damage to your vehicle or loss of performance and so on.

That is the main concern. Anecdotally, one of our colleagues in the states was telling us about he very regularly stops at a station with E-85 pumps, and the fellow was telling him that one of the biggest uses of his time in any given day is running out and stopping people who should not be putting E-85 into their conventional vehicle.

MR. WINSTON: All right, let me just take one more clarifying one. These are clarifying questions? Clarifying?

AUDIENCE MEMBER: Sort of responding to that.

MR. WINSTON: Let us get to the analytics. Just clarifying at this point. We will have plenty of time for analytics.

Let us move on, then, to our third speaker, Samantha Slater with the Department of Congressional Regulatory Affairs Renewable Fuels Association.

MS. SLATER: Thank you all for having me here this morning, and hopefully I can have my own answers to those questions, but I will get through my presentation first. Although I will say that I live in Springfield, Virginia, where we blend at 10 percent ethanol, I drive a Volkswagen Beetle, and I drive to and from the Metro, so I only fill up once every two weeks, thank God, and I have noticed nothing. So, it might be the Prius, who knows.

I am director of Congressional and Regulatory Affairs at the Renewable Fuels Association, we are about a block away from here, so it was an easy commute this morning, and I am going to give you a bit of a perspective of where we are in the U.S. ethanol industry today.

I always start out with a couple of charts of numbers. We had to send our slides in on April 2nd, so I will update these numbers as we go along, because they have changed. We ended 2006 with 5.3 billion gallons of production capacity online. For the year 2006, we produced about 4.9 billion gallons with a demand for ethanol here in the U.S. of about six billion gallons. So, obviously, we imported a great deal of ethanol last year, 433 million gallons from Brazil alone, not counting what came in through CBI tariff free.

There are currently today 115 plants online in 19 states with 5.7 billion gallons of capacity. There are 79 plants under construction, seven expansions, and we expect by the time we get through 2009, to add about six billion gallons of additional capacity.

Our numbers do not count the hundreds, if not thousands of ethanol plants nationwide that are in various stages of permitting, feasibility studies, development, trying to get their financing together. We only count plants that have dirt turned over, steel and concrete in the ground under construction facilities. So, with the rare exception, all of these plants will be built.

A few more numbers on what the U.S. transportation fuel market looks like today. We use

about 140 billion gallons of gasoline every year. The diesel market here in this country is about 45 billion gallons. To put it in perspective, we actually only use 50 million, that is million, not billion, gallons of E-85 nationwide. So, it is a much smaller market than you would assume, given the amount of conversation it gets, certainly here in Washington.

Ethanol today is used mostly as a blend additive, obviously, and that would now be 5.7 billion gallons, and John already mentioned it is about 300,000 barrels of supply, and API's numbers do show that we are blended in about 46 percent of gasoline nationwide.

I should note, that is not 10 percent nationwide, states like California blend at 5.7 percent. So, while we are in 46 percent of gasoline nationwide, it is at varying degrees between zero and 10 percent.

These are our numbers, and they, again, have changed, compared to the RFS, which was enacted in 2005, and where our projections based on those numbers of plants under construction put us. If I remember correctly, I think we'll be at 8.6 at the end of this year, 11.3 at the end of 2008, and 11.4 at the end of 2009, although I just looked at those briefly as I was putting them into testimony yesterday. You will notice that we will blow by the current RFSes as early as July.

These numbers break it down even further by quarter. You will see a great deal of capacity coming online in the third and fourth quarter of this year, and the first and second quarters of next year.

Leading industry growth. These bullet points should not surprise anybody. The renewable fuels standard that was in EPAC 2005, and of course several other federal policies that we will talk about in a second, sustained high gas and oil prices. I think I paid $2.89 this weekend. State ethanol programs, about 19 or 20 states currently have ethanol mandates or incentive programs in place. Not as many this year that I have heard looking at new incentive programs, but certainly many in place today, continued E-85 growth, NTBE coming out of the marketplace last year, a constant need to expand our fuel supply here in the U.S., and given the climate change debate that is going on in Washington, of course our environmentally friendly profile does not hurt.

Cellulosic ethanol, everybody's favorite subject. The next couple of slides are about cellulose. Today, technology and costs are still limiting factors. The running joke that I am sure many of you have heard is that cellulosic ethanol has been five years away for the last 20 years. If you had asked me a couple of

years ago, I probably would have agreed with that joke, but it is actually probably much closer than most people think, and five years away is probably just about accurate.

In EPAC 2005, there is a carve-out for cellulose that begins in 2013 for 250 million gallons of cellulose, and I would imagine that is pretty close to the target where we will be.

Today, costs are about four to five times that of a grain-based ethanol plant to build a cellulosic ethanol plant. Most of the first cellulosic ethanol plants that we will see will likely be co-located, if you will, with today's grain-based facilities. Most likely because a lot of the first feedstocks that we will use will be the corn fiber, the corn stover, and other ag waste that is already at the plants.

A couple of policies driving this push towards cellulosic ethanol. Many people are looking to the President's 2007 State of the Union address, but actually what really, in my opinion, helped cellulose to take off was his 2006 address, where, as I mentioned before, a five-year goal, his 2012 goal to make cellulosic ethanol cost competitive is actually probably as close to or right on target as we can get.

And then of course looking at his 2010 proposal,

35 billion gallons of alternative fuels by 2017. Keep in mind that is alternative, not renewable. So, that pot, if you will, would include ethanol and biodiesel and methanol and hydrogen and electric cars and coal to liquids and all of that.

Another popular question that gets asked here in Washington is, is there a blend law for ethanol, being 10 percent. That would be about 14 to 15 billion gallons. We could conceivably get to that point, from grain-based ethanol, the National Corn Growers Association believes that by 2015, they could be producing a 15 billion bushel crop, and produce 15 billion gallons without significantly impacting other markets, and we do accept their analysis on that.

So, we will be looking going into the near term future at higher level ethanol blends, E-15 and E-20, as we make the transition to E-85 or higher level blends. Obviously we cannot go from E-10 to E-85 in one fell swoop, we couldn't ramp up enough ethanol to do that nationwide, we couldn't turn over a vehicle fleet, we couldn't get the pumps in place, so we need to be looking at something in between E-10 and E-85.

And this is a chart that VeraSun, an ethanol producer in South Dakota who is doing a lot of work with GM to get pumps in place in different locations where

there are a lot of FFEs nationwide, and they think we could have as many FFEs on the road by 2015. Today there are about six million FFEs on the road, 1,200 pumps nationwide. To put those numbers in perspective, there are about 220 million cars on the road today, 170,000 pumps nationwide.

Our legislative parties for 2007, what I call preserve, protect and defend V-Tech and the secondary tariff on ethanol. V-Tech is the blender' credit, it is the 51 cent credit, however you are familiar with it. The secondary tariff is the 54 cent tariff that imported ethanol pays when it comes into this country. That is an offset to the 51 cent blender's credit, it is in place to protect American taxpayers so that they are not further subsidizing imported ethanol, all of which have their own incentive programs in their countries of origin.

Again, moving to higher level ethanol blends and exploring those opportunities, continuing to explore E-85 opportunities, including increasing the infrastructure, and further optimizing the FFEs so that you do not notice a BTU difference.

Cellulosic ethanol, as we've already talked about a lot, the grant and loan guarantee programs, making sure those programs that have been authorized are

fully funded is incredibly important to our producers.

Then of course the RFS. Not our number one priority, which surprises a lot of people, but stay tuned for the hearing tomorrow, you might be hearing some more about that.

This is my contact information. We are right across the street. We are all at one main number, but if there is ever any questions that you have, I would always prefer that you get the information direct from us. We are easy to find, please do not hesitate to call if you ever have any questions that we can help you with.

MR. WINSTON: Questions of clarification? Please say who you are.

AUDIENCE MEMBER: I am Howard Schivik [phonetic] from the FTC. I have a question for you. You mentioned that ethanol procedures are environmentally friendly. If you take into account the fertilizer used in production and the energy used in production?

MS. SLATER: Yes.

AUDIENCE MEMBER: Is it still environmentally friendly?

MS. SLATER: Yep. The greenhouse gas emission reduction for grain-based ethanol is about 20 percent. It is believed that cellulosic ethanol would be about 80

percent, and that is well to wheels.

AUDIENCE MEMBER: Okay, thank you.

MR. WINSTON: Yes, sir?

AUDIENCE MEMBER: I am Michael Canes with LMI. Just a question on a piece of data that I saw in one of your slides. You said that diesel demand is 45 billion gallons a year, but the EIA numbers for highway diesel demand are 38 billion, as of 2005. I was just curious what the source of the data was for that particular number.

MS. SLATER: I believe ours come from the National Biodiesel Board.

AUDIENCE MEMBER: We are speaking here about petroleum-based diesel, right?

MS. SLATER: Yes.

AUDIENCE MEMBER: And you showed 45 billion gallons. I am just saying EIA's numbers for that very category are 38 billion.

MS. SLATER: I am sure they're right. I will have our fact checker double check, but the point of that being is that we do not play in the diesel market, we are in the gasoline market. So, it doesn't really matter.

MR. WINSTON: Okay. Good. Right on time, and we have one more presentation and then discussion, and

this is from David Austin from Congressional Budget Office.

MR. AUSTIN: Thank you, Clifford.

I will start this with the question about putting E-85 under the canopy at gas stations reminded me of something that happened to me once when I was in grad school, a friend and I were embarking on this multi-day road trip, really looking forward to it, and the first thing that we did was stop at a gas station in Middlebury, Connecticut, I guess it was, and somehow he managed to fill up his Honda Accord with diesel fuel, and trust me, you do not want to do that. You might as well put Coca-Cola in the tank.

Anyway, I am aware it is April 2007, I hope there are no other errors in my slides, but I am going to be talking about what CBO has done on a couple of gasoline consumption policies and put them in the context of new automotive technologies that were described earlier.

So, I won't be talking about policies to encourage the development and adoption, per se, of those technologies, but rather how that will be affected by policies relating to gasoline consumption itself.

And for non-economists in the room, any time you impose a policy, you want it to be enhancing to the

welfare of society as a whole, and that can only be accomplished if you can base the policy on the existence of a market failure, and so for example, in the case of gasoline consumption, if you want to impose CAFE standards, you want to be able to point to the fact that consumers may lack the information they need to make the right choices about fuel economy in the cars they buy, or that they are discounting the future savings in out years too much.

If either of those is true, they will be undervaluing the fuel savings from their new vehicles and they will buy too little fuel economy. So, we've had years of technological advances, and yet you see that the average fuel economy of the private vehicle fleet in this country has been relatively stable, and that does not mean necessarily that there is a market failure, it just means that those technologies can be deployed in various ways, and the ways consumers seem to prefer their use is in enhancing the performance and other features of the cars they buy.

In other words, they like other things more than they like fuel economy, it does not necessarily mean they are undervaluing fuel economy.

Now, when you start thinking about plug-in hybrids and exciting technologies like that, I mean, one

potential outcome of the introduction of that technology would be that consumers start driving around RV-sized vehicles that get 22 miles per gallon, and if there is no market failure, you would not necessarily have a market failure basis for imposing a policy to prevent that kind of outcome.

You can make a judgment as a society that you want to avoid that kind of use of those technologies, but unless you can make some sort of argument that having RV vehicles on the road with smart cars involves some sort of safety externality, you do not necessarily have a market failure basis for outlying that kind of use of plug-in hybrids.

If you cannot point to a market failure reason for a gasoline consumption policy, you can still point to the social costs of gasoline consumption itself, and we are all familiar with what those costs are with respect to gasoline. If you are not paying for the tailpipe pollution that you are producing, or the congestion or noise or whatever associated with your driving, then you will be driving too much, you are not internalizing those externalities.

Here we are talking about gasoline taxes cause consumers to face some of those costs. I think we can all agree that if gasoline cost $7 a gallon here as it

does in Europe, we would have a very different looking market for driving and for passenger vehicles. Now, if we imposed gasoline taxes commensurate with all of these costs of driving, I don't think we would get up to $7 a gallon, but the point is that if you did price all the social costs of driving and gasoline consumption, the market could look a lot different from the way it looks right now.

So, the two policies, obviously, that I have been talking about are standards and taxes. They can co-exist, but here I am just going to talk about the different features that they bring and the different rationales for imposing them. One of the policies is more costly than the other, but the outcomes are not necessarily the same.

CAFE standards: The advantage of CAFE standards over a gasoline tax is that it will certainly save fuel, and you can estimate with reasonable precision how much fuel it will save. It may correct a market failure, as I described earlier, in the sense that people may be undervaluing fuel economy. If it is not correcting market failure, then it is imposing constraints on consumers that economists have to count as costs.

Another advantage from the political standpoint of CAFE standards is that its costs are mostly hidden,

and of course there are direct costs that people always point to when they talk about increasing CAFE standards, which is that it would increase the technology cost of a vehicle, but in truth, a lot of those costs would come right back in fuel savings. There are other hidden costs that I will describe in a bit that CBO is mostly focusing on.

One of the difficulties with a CAFE standard, though, is that by making cars cheaper to operate, it will encourage additional driving, and when we talk about what are the potential fuel savings from CAFE standards, we know that it increases driving, and we have estimates of how much that driving will increase, and so any discussion about how much fuel is saved by CAFE standards takes into account that there will be additional driving.

The other policy that I will contrast this with is the gasoline tax, and here, as I have said before, a tax can internalize the social costs related to pollution, and here I am not just talking about a tailpipe pollution, rather I am not just talking about the criteria of pollutants that we are all familiar with, but the carbon emissions that are implicated in climate change.

A gasoline tax, because you are taxing a bad, is

nondistortionary, so it will cause resources to be allocated more efficiently, and politicians haven't really begun to work with us yet, but the fact is that you can impose a big gasoline tax and offset it completely with a reduction in some distortionary tax like the income tax. You will make people better off, and the economy work more efficiently, and even though you are offsetting that gasoline tax, you will still have all the incentives that a gasoline tax brings as far as conserving fuel.

A tax is, of course, a market-based instrument, so you are not constraining consumer choices, you are just changing their incentives. The difficulty with the gasoline tax, as we all know, is that the costs are explicit, and I think the price of gasoline is probably the most explicit cost we face in society, because the prices are posted in these foot tall numbers on every street corner.

However, CBO's analysis indicates very clearly that compared to a standard, a gasoline tax is the cheapest way to reduce gasoline consumption.

Right, and to relate this, then, to the previous speakers and these exciting new automotive technologies, the gasoline tax would, of course, give consumers direct incentives to adopt these more fuel-efficient vehicles.

Standards would do the same, just differently.

So, then, underlying this whole discussion is why are we trying to encourage automotive fuel efficiency, and the laundry list of issues that need to be addressed by policy are the externalities. Again, I am not saying anything you are probably not familiar with. Carbon emissions, energy security, and by this, economists do not mean being in the Middle East or not being in the Middle East, okay, because that is not a marginal effect. These are marginal policies, and so increasing the price of gasoline is not going to get us out of the Middle East, only not using gasoline would get us out.

So, what economists mean by energy security is just it reduces the reliance of the economy on gasoline and so it reduces the risk of price volatility. So, that is what we mean.

Congestion, noise, accident risk, and then in quotes, sprawl. An ill-defined term, but I think that we can agree that cheap gasoline has distorted land use patterns in ways that may or may not be best for society. I mean, I think people who live out in the far suburbs enjoys the bigger house that they can afford and the large land, but the commute detracts from that quite a bit.

Missing from this list on externalities is criteria pollutants, and that is not a rationale for increasing the gasoline tax, the reason being the way EPA regulates those pollutants, it is on a grams per mile basis, so in theory, there is no link between fuel economy and criteria pollutants.

In practice, there is somewhat of a link, but it is largely broken. If you have a less fuel efficient vehicle, you just have a bigger catalytic converter.

So, anyway, if you are going to impose a tax, a gasoline tax based on the externalities I have listed here, the best, most recent research on this suggests that those costs add up to about a dollar per gallon, and so that would be the optimal tax to impose to address those externalities.

And let me say that since the tax already is about 40 cents per gallon on average, so this would be a 60-cent increase. At today's prices, that means about a 20 percent increase in price, and if you are wondering how the market would respond to that increase in price, consumers do not respond a lot to the price of gasoline at the scale we are talking about.

So, a 20 percent increase in the price of gasoline, in the short run, could reduce consumption by about one percent. So, again, this is a really marginal

effect. In the longer term, you might get an effect up to about five percent, but a gasoline tax that could be justified on the basis of all these externalities is not going to solve our energy problem, and I don't think it is going to be enough to cause everybody to switch to plug-in hybrids, just on their own.

To get back to the market failure issue, and I have been somewhat dismissive of that. In CBO's analysis, we assumed that there was no market failure, but there are plenty of very good economists who think that there is an argument for market failure. It is not that consumers lack the information, I mean, it is right there on the window sticker on the car that you buy, not just what the fuel economy is for the car, but what the operating costs would be.

I think the best argument is that used car buyers do not see that sticker, and if you buy a new car and you expect to sell it soon, it may be that used car buyers are not going to be valuing the fuel economy, and so that may cause you to undervalue it.

How much to encourage fuel economy: The externalities, the carbon-based externalities in energy security, best estimates are 25 to 50 cents per gallon, so you would not want to spend more than that to reduce gasoline consumption using CAFE standards, but those

standards would worsen these other externalities by encouraging driving.

CBO's analysis a few years ago put this as the cost comparison for standards and for a tax that would do the same thing. That is a de minimus tax right there, just 30 cents per gallon, it was based on $1.50 gasoline, and also technically that tax would not reduce consumption by 10 percent, but it would save the same amount of gasoline in present discounted terms over the 15 years it would take CAFE to reach its full effect.

Last couple of slides here. There are reasons for optimism as a consumer. I think these new technologies could be exciting enough to make people want to adopt them just to have them, in which case if consumer preferences outpace standards, it could be free to impose CAFE in the sense that it would not be necessary to impose CAFE.

Big gains in fuel economy could cause people to become that excited, I think, about these new technologies, and the technologies could as well reduce the cost of saving gasoline, which would cause us to say that higher standards could be justified on a cost basis.

Just in conclusion, so here is our cost curve for the cost of CAFE, it is based on technology costs,

assuming nobody wants CAFE standards, so the costs start right away, at a 10 percent reduction in consumption, we are talking about, if you put this in a cost per gallon, say, of that is about 50 cents there.

Finally, to be optimistic about gasoline tax, there is always a reason to impose a gasoline tax, because those externalities related to gasoline consumption are not going to go away. That is it. Thank you.

MR. WINSTON: Questions of clarification? Yes, please.

AUDIENCE MEMBER: Katherine Ling, Medill News Service. I was hoping Mr. Austin could address a little bit more the findings that CAFE may or does have people driving more, and then has anyone considered --

MR. WINSTON: Let us hold on that one, that crosses analytical. We'll get to that one.

AUDIENCE MEMBER: Has anyone considered CAFE standards and a gas tax?

MR. AUSTIN: Yeah, and they exist now, so --

MR. WINSTON: Any just clarifying questions? Matters of fact?

AUDIENCE MEMBER: Has the Congressional Budget Office considered the political reality of imposing a 50 cent gas tax?

MR. WINSTON: Let us hold up on that one. We are getting to that. Let me briefly summarize at least how I hear this, and then raise a four-part question, one question with four parts for each of them to address to get the discussion going, and then you all can jump in.

So, this session actually focused on improving fuel economy, reducing fuel use, and there were three tools, if you will, that were offered to do it. One was changing or improving vehicles, vehicle mix, to be able to get greater fuel economy, that was the first presentation by Terry. Then the next two dealt with changing the fuel that we use, that was the ethanol presentations, both John and Samantha dealt with that. Then the third way to do it would be through changes in public policy, either increasing the gas tax or CAFE.

All right, so let me, as now a discussant, raise doubts about all this. Why I do not believe any of this. David raised the issue in his presentation on the demand side. So, these were supply side orientations on the first three, and so I will say, well, yeah, but what about the demand side?

So, the discussion about improving vehicle mix, that is great, and we've done that with safety, too, improving safety equipment, but we know that the

consumers react to these things and they want to take these benefits in their way. As David pointed out, over the last two decades, there has been significant improvements in engine design to improve fuel economy, but there has been no increase, virtually no increase. People have taken it all in horsepower.

So, this one is for you to think about, when you get them all and you can go through them. Why should I believe that the next 20 years would be any different, that if we improve the design of these cars, that in the end the people will say, oh, great, you know, I can get greater fuel economy, but that means I get more power at the same fuel economy. Why aren't they all just going to continue to take it in power?

And you might have just seen in the Wall Street Journal, Robert Lutz just said that. He made this big point of saying, people want power. Now, I think he is wrong, he made the comment, people still value fuel economy, sure, they still value it, but if you can trade it off on something they like better, you will see that.

So, I want you to comment on the demand side of why we really think this is going to be manifested in fuel economy.

The other presentations were on ethanol, and again, let us look at the demand side for this, but also

the auto producers, in particular the Japanese, who I look at as understanding what is going on in the market here in the U.S., again, not projecting forward, what are they going to have, 80 percent probably in the next two decades.

I am not going to buy one of these things. Why do I want to be driving across country having to look for gas stations. What proof is there, really, that consumers are willing to go to vehicles with ethanol, when there is an extreme risk that they won't be able to get it. In particular, what evidence do I see the Japanese auto makers are moving in this direction, that they really think this is what is going to be happening. And that they are preparing their vehicle fleet. They obviously think that we can do it in it hybrids, that tells me something, but I do not see them getting all excited about ethanol, and I certainly do not see consumers ready to take the risk of doing that. So, speak to me about realistically where we are going to see this.

On the policy side, gas tax and CAFE, in my view, are terrible policies. Gas tax is bad because it does not hit anything. It is bad for congestion, because it does not vary by time of day, okay? It is bad for accidents, because VMT is not really the source

of accidents, it is bad driving behavior. Okay? It is bad for emissions. You want an emission tax, okay? Not a straight gas tax, you want something that varies by vehicles and places and locations.

I have never understood the energy security, I do not understand that at all. So, I mean, I think that is kind of crazy. So, I do not know why I would impose a gas tax, it is just a bad tax, it does not hit anything.

CAFE, obviously, is not any good either. I mean, there were many offsets that were not mentioned, particularly on safety and increased VMT. So, I do not see any room for policy improving any of this, and I am also not convinced that there is a market failure, first and foremost. I did not hear a strong case at all. Used cars, come on, people who buy used cars buy new cars. Why are they all of the sudden stupid? I do not believe that.

So, each of you please take turns and try to strengthen your positions on why we are going to solve fuel economy by your favorite area. Beginning with Terry. Then we will just move down.

MR. PENNEY: Well, consumer behavior is one of the big questions as to whether people will embrace a technology, and right now you can buy a $25,000 car or

you can buy a $50,000 car, and people say, well, hybrids or plug-in hybrids that I talked about, will never be able to afford the battery technology. Then one comes back to why do people do what they do? Why do people pick up these options, and I would like to speak to what you said Bob Lutz was saying.

There is relatively eight car companies in the world, close to eight. They feed you what they want to feed you. You are not given really the choice. So, part of the horsepower driven argument is coming out of Detroit. I think, although Toyota has moderated their new Camry hybrid to trade off fuel economy with horsepower, the question really belies itself as to whether or not that is what the consumers want. You have to buy what they sell you.

So, I am not convinced that this horsepower trade-off is really what the consumers want, it is because that is what is being offered up. I think the double digit growth in hybrid sales is data which just proves that perhaps maybe Detroit is wrong on their vehicle sales.

MR. WINSTON: John and Samantha?

MR. FELMY: Well, first of all in terms of ethanol, I think it is clear that there will be a growing role in the E-10 market with the existing

vehicles, with the existing infrastructure. I do not see a hurdle of the type that you are articulating. It is a question of consumer choice, it is an open question. Ten years from now, if hybrids will be as popular as you are seeing in terms of growth right now, as people use the vehicles to 100,000 miles and they start to deal with battery issues and regenerative braking issues and things like that, it is still an open question in terms of consumer acceptance.

I think there will be a growing role for diesel technologies, with the new fuels that we have, including biodiesel, and so on. Your point on what Detroit says, I think is interesting, because if you look at the advertising that comes out, there is very few that talk about fuel economy, and I watch, maybe it is just because I only watch the food network and that is all they show, but the --

MR. WINSTON: The corn network.

MR. FELMY: So, it is a question that we have to get forward, but I do think that we will see improved technologies, I think that it will not just be horsepower, I think you will see improved fuel economy, it will be incremental, and it will be in all these things.

MS. SLATER: I would agree with what John said,

and it is about consumer choice, and today the only place consumers can choose ethanol is E-85. Whether you are blending from zero to 10 percent at the gas station on the corner really is not up to you. There are no issues with blending up to 10 percent, that is not what we are talking about.

Going forward, and I mentioned at least once, if not twice, in my presentation, nobody thinks we are going to go from E-10 to E-85. That would, as I said, require a great deal of ethanol, a lot of pumps, and a lot of cars on the road that are not there. As I said, there are six million vehicles on the road today, about one million of those car owners actually know they are driving an FFE, so there remains a great deal of education to be done. That comes from our industry, certainly, from the auto industry, from the dealership. There need to be more pumps in place. I think we are hoping once we work through a lot of the underwriters lab issues, we will see companies like Wal-Mart move to put E-85 pumps at their super stores nationwide, which would certainly help getting that infrastructure in a variety of locations nationwide. A lot of the clean cities money, the DOE awards, if you looked at the awards that they gave out in August, they were all across the country, they were certainly not just located

in the midwest.

So, while there is a lot of work that remains to be done, there are policies in place today that will help us get there. There are many policies that need to be put in place, and as I mentioned, we are going to need something in between there, and that is why we will be looking at E-15 to E-20 blends that could be used in today's existing pumps and in today's existing vehicles.

MR. WINSTON: Wal-Mart, best company in the country.

Okay, David?

MR. AUSTIN: And I will address Cliff's provocative comments on policies. I agree with him on most of what he said, and as I said, CBO's work on the CAFE standard assumed that there was no market failure in fuel economy. For a gasoline tax, it is not the perfect way to address some of those externalities like congestion. You really do want to have time of day pricing, and that will come, now that we have these little fast pass transponders in our car, we could readily impose a congestion tax, and it is being done, of course, in some areas.

So, I guess the question would be is it better to have an imperfect policy, which a gasoline tax is, or no policy at all. There are justifications for having a

gasoline tax. I mean, carbon is I think by general consensus implicated in climate change. So, that is a reason to have a gasoline tax.

A tax does improve congestion, it is just not the best way to do it. Accidents, I do not know how you would tax bad driving, but this is the second best way.

Let me just address the question about having a tax and standard at the same time. If you believe that there is no market failure in standards, and you impose a gasoline tax of let us say 50 cents a gasoline, that in theory should already give consumers all the incentive they need to buy a more fuel efficient vehicle. So, in theory, having a gasoline tax would make CAFE standards redundant and harmless. My personal belief is if you want to reduce gasoline consumption and you have a good reason to do it, do it with a tax, not with standards.

CBO talks about political realities of gasoline tax, no, that is beyond our purview. That is for legislators to worry about.

MR. WINSTON: Okay. Everybody else's turn. Remember to introduce yourself.

AUDIENCE MEMBER: John Carey [phonetic], GAO. In terms of the gas tax, Cliff made the comment that it has no impact. Yeah, it has no impact because the

demand is pretty much relatively inelastic. I mean, consumers do not have that much options. And so it goes back to why do we have that kind of situation? What is the state of competition? All those have barriers on why taxes are not having any impact. So, maybe, I do not know whether that is for you or for the agency in charge of regulating these companies to answer that question.

MR. AUSTIN: Economists are finding small market impact of gasoline taxes, but I guarantee you in the long run, if you had really expensive gasoline, you would not have people commuting from West Virginia to D.C. So, they do in the long run have choices, but the infrastructure is not fully there to support everybody moving to Bethesda and living right next to the Metro station.

AUDIENCE MEMBER: But are we moving there?

MR. AUSTIN: Not yet.

AUDIENCE MEMBER: Thank you, Michael Canes with LMI. Just a very brief comment and then a question. I agree completely with Cliff Winston's statements about a gasoline tax not being the way to go after the externalities that were identified. The same true would be true for noise, you would just simply tax noise per vehicle, if that is what you were interested in doing.

You would tax accidents if you wanted to tax bad driving behavior.

The question is for John Felmy. John, you mentioned that you think the diesel market might be expanding, maybe even relative to the gasoline market, and that is one way to increase gas mileage, right, more BTUs per gallon rather than less BTUs per gallon with other some of the alternate fuels.

I am curious what the refining industry will have to do to adapt to a world in which you might see more diesel demanded and supplied.

MR. FELMY: Well, it will be a huge challenge, because right now our refinery system is configured to produce roughly 50 percent gasoline, 24 percent distillate, including heating oil and diesel fuel, 10 percent jet, and so on, whereas Europe's refining capacity is set up much different to deal with the higher use of diesel there.

It would be a substantial amount of investments required in terms of the capital costs, in terms of the additional capacity expansions to be able to do that. If it is done incrementally over a period of time, that presents the opportunities for doing it in a smooth transition, but it would be a sizeable capital cost for the industry.

MR. WINSTON: Let me just clarify one thing on the accidents. My proposed solution would be a quantity based, a quantity-based solution. You know, an overwhelming large share of accidents is driving while intoxicated, and what is amazing is that the amount of repeat offenders in this is staggeringly high, more than a third, and what I would think would be more something along the lines of much, much stiffer license suspensions on the quantity side of these people. The quantity side. Okay.

AUDIENCE MEMBER: Hampton Newsome, FTC. I was wondering if Mr. Penney could get into a little more detail on V2G, basically the idea of storing electricity in plug-in hybrids. This is obviously an issue for the future, but not only is there discussion of using that to deal with peak load issues, but also using that to deal with the intermittent nature of renewables, and I am just wondering is this something that is seen as an issue with great potential or is it just something that would be kind of on the edges helping out?

MR. PENNEY: Well, I think there is a lot of discussion, or at least some discussion that as I presented it would first go in steps, you know, one-way communication, but V2G, and we are working with several utilities across the country as a matter of fact on we

have a plug-in hybrid where utilities are very interested in when people will actually plug in and what the opportunity for them is, and we are conducting a couple of studies with the Electric Power Research Institute on just that very subject.

So, I think the answer to your question is I think it has great potential. It will not have great potential for a number of years because it takes many, many years to have that number of vehicles, but as I indicated, it really is enabling for wind, it changes the competition entirely for that intermittent renewable load, so you have to look at the systems perspective and look at the entire enterprise, and I think consumer behavior, if you could get 50 bucks a month for your car, which is basically a stranded asset, if it could generate electricity for you, or a revenue income, or even a net power basis that you give the utility back something and you can ultimately run the meter back and forward, there might be a value stream in that proposition.

So, I think it has great potential, it is farther out there, but I think it might come along.

AUDIENCE MEMBER: Vanessa Siezlak [phonetic] with the Congressional Research Service. Yesterday during one of the panel discussions on demand and supply

issues, a couple of the panelists expressed their concern about the U.S. putting so much time and effort into the ethanol market, and I am sure we are aware of the politics and policies that are behind corn-based ethanol, but they also expressed a concern or explained about the interests that the Chinese are putting into their efforts and time into the methanol market, and one of the panelists said, what do the Chinese know about methanol that we do not know, and is the U.S. spending too much time and effort in concentrating just on ethanol and not other alternatives. If you could please comment.

MS. SLATER: We are certainly not going to have me say what I think you would like me to say, and I would not comment on what the Chinese are doing on methanol, I have absolutely no knowledge of that. This country has tried methanol before, and it did not work out very well. So, and again, we do not represent methanol. So, I couldn't tell you why that happened, it was well before my time. So, I couldn't tell you why or how that experiment failed as well.

I think today your only choice for a renewable liquid transportation fuel is ethanol. So, until things like biobutanol, which is really the only other gasoline alternative fuel that you hear about people talk about,

which today is not in existence anywhere. DuPont is looking to go experiment with biobutanol in Europe first, and then when they have success there, then bring it to the U.S. So, that is certainly a long time away.

Coal to liquids is really Fischer-Trope's diesel, which would compete in the diesel market, not the gasoline market. So, we welcome other alternative fuels as the President would throw out there to compete, and we absolutely believe that eventually it will be the market that determines not only which fuel but which feedstocks for those fuels.

AUDIENCE MEMBER: Hi, Peter Rohde with Energy Washington. Samantha, you said that one of your top priorities is to protect the tariff, but because of that drawback loophole, nobody is really paying the tariff. Are you guys aggressively pushing Congress to plug that loophole on the drawbacks?

MS. SLATER: That always comes up, as you know, on December 6th they extended the tariff through January 1, 2009, and you hear people bring up, certainly Senator Grassley talk about fixing that loophole when there is a moving vehicle in Congress to deal with the tariff and so far that has not happened. It is certainly something that we would like to see fixed, but given that we just extended the tariff, a few months ago, until that comes

back around again, it is not something that we immediately talk about when we talk about the tariff.

AUDIENCE MEMBER: Part of the subject of this conference was public policy. The auto industry has not shown a particular willingness to voluntarily do anything. An example, the case in Vermont yesterday, where they are fighting the California standards in 12 states, but is there a role for government? Does government have to force these changes, as opposed to the industry and consumers just demanding them?

MR. FELMY: Well, I would like to strongly disagree that we are not doing anything.

AUDIENCE MEMBER: I said the auto industry.

MR. FELMY: You said auto, I thought you said oil. I apologize. At my tender age and my hearing is going. So --

MR. WINSTON: Go on. Did you want to respond? You can comment. Do you want to comment?

MR. FELMY: Well, in terms of the oil industry, I mean, I would make a clear case that we are strongly supporting improved efficiency, we are strongly improving technology, improvements in vehicles, reducing emissions wherever you can. I mean, we have been behind this for quite a while. Our refining industry is committed to improving efficiency by 10 percent over 10

years, they are on track to do that. We are not ones who are large supporters of mandates, but we do think that there are things that you can do going forward. We have made commitments in that regard, and so we feel like we are doing what is appropriate for our consumers.

MR. WINSTON: Other response to policy?

MR. AUSTIN: Well, I guess I would just say the role for government should always be founded on that bedrock of externalities or market failures, and of course I shouldn't really say bedrock, because there is a lot of disagreement about whether something is or is not a failure or what the benefit would be of reducing some externality. Those things have to be measured and estimated, but you do need to justify government policy on the basis of one of those two things. You cannot just willy-nilly say this is what we want and we do not have any reason for wanting it.

MR. WINSTON: Let me just add to that one. Another issue beyond that, even whether in theory government intervention would be justified is in practice what government performance has been. So, you would actually want to know, well, what is government's track record on that? If you go to my website, you can see my book that is called Government Failure Versus Market Failure that assesses what government has

actually done on all areas where there is allegedly market failure and in cases where there actually has been, has government actually even made it better.

AUDIENCE MEMBER: Gerald Karey with Platt's. I want to give John another chance to have the industry step up to the plate. Apart from plug-ins, whatever fuel folks are using in their cars in the future, they will have to pull into service stations, which would require, presumably, a great investment in new infrastructure to provide those fuels.

Who should pay for that? I know the industry has some problems with considering the infrastructure needed to pay for ethanol. So, how should that be paid for?

MR. FELMY: Well, we feel it is really unfortunate for some of these proposals that are arguing that the 170,000 service station owners who are largely small businessmen should bear the burden of investing $30 to $100,000 for a market that is not there yet.

For that matter, it has yet to be proven to me why those E-85 pumps have to be at the current service stations. For example, there is 20,000 new car dealerships around the country that have tanks and pumps and facilities that could easily accommodate those, and would be very consistent with trying to sell the

flexible fuel vehicles.

So, we feel that these notions that somehow it should be paid for by the industry when there is not a market there is really problematical.

Now, if you want to jump start it, then you can start talking about incentives, because the margins on small businesses that are operating these gasoline stations are not very large, and they could wipe out a year's worth of earnings.

So, I think it is a discussion that we should have, in terms of trying to advance it, but we need to talk about where they should be and, as you said, who should pay for them.

AUDIENCE MEMBER: Yeah, David Rosenberg. I just wanted to make a comment on the elasticity of demand, because I was working for Northern Natural Gas in Omaha, and in the early 70s an executive got up and told all the young employees that there was no elasticity of demand for natural gas. It did not matter what the price was, the people would use it.

Three years later, people got their December gas bills and they were triple what they had been the year before. The executives there quickly learned that there was, indeed, elasticity of demand, but it was what we kind of decided we should called catch-up elasticity of

demand, where you can tap it forever and not a thing will happen, but you give it one whack equal to three taps out at Poor's. I think the same thing applies to gasoline, I think to cigarettes, and there is probably other commodities out there that are like that, you just keep easing the price up and nobody cares, but if you give it one big jump, like a $3 tax on gasoline, I think you would see some response from people.

MR. AUSTIN: Well, we actually have some direct evidence on that. Just the whipsawing of price over the last year or so after Hurricane Katrina and again the $3 gasoline we saw last spring. So, at the time those were unprecedented and a big shock and consumers reacted. I mean, even in the market for new vehicles, you saw more reaction than you would expect. People were acting as if the $3 gasoline was the best forecast for future prices, which may or may not have been correct.

So, the elasticities when those things were a shock were bigger than what is being estimated in general, and what I worry about is that people get accustomed. I mean, you know, as a share of personal income, expenditures on gasoline have been declining, and that is one reason elasticities have been.

MR. PENNEY: DOE did a study, and I think the price of gas had to go up to $5 bucks a gallon before it

really made a difference, and with regard to David's comment, when we saw in the vehicle industry, about two weeks after the price came down, people were back in the showrooms buying those SUVs. So, it did not take long. Yeah, was not even months, it was weeks.

AUDIENCE MEMBER: In my neighborhood people either buy Priuses or nothing.

MR. WINSTON: There is another factor that's interesting. There's rate creep in vehicles, that your Camry that you got before now is a much heavier Camry, and these things continue to inch up so to speak. Now, there may be, again, consumer demand for this for safety, but that is also sort of slow but sure in the vehicle fleet that obviously is going to have impact.

MR. AUSTIN: Some of that might be sort of a weapons race, if you will. I want a heavier Camry if you are going to be buying a big Chevy Suburban or something.

MR. PENNEY: Well, actually, the vehicle weight if you look at the details of how that distribution in the vehicle, we are using more plastics, we are using more aluminum, we are using more mag, but we are also having a motor. I do not believe you can buy a car today with roll-up windows, they are all electric windows. So, I think I was talking to Chrysler and they

said their upscale for GM or their upscale product has 81 motors in a vehicle. Can you count them all? 81 motors. Mirrors, seats, and that all those motors have to weigh something, and they all have copper in the motors.

AUDIENCE MEMBER: Yeah, Tom Orvald from Heller Ehrman. I just wanted to shift gears and return to the question about hybrid vehicles, and you mentioned that it might help alleviate the intermittent nature of the renewable energies, like wind, solar, and I just wasn't following that all the way. How exactly would the hybrid vehicle plugged into your house --

MR. PENNEY: Okay, let me explain that a little bit, and I will use wind as the example. Most utilities are finding that wind is almost competitive right now on a cost per kilowatt basis of installed capacity. The problem is it is a very small percentage, and when they get that wind, it is usually at night. If you look at load matching and that load duration curve that I showed, everybody goes to bed at night, so there is not that load.

So, they can use a renewable at night up to a certain capacity, that is the turn-down capacity of their plant, and how their mix of generation is. So, if they add more wind, let us say the city of Austin, or

Texas has lots of wind, the more wind they add, if they do not have that load at night, it does not do them any good.

So, by adding hybrids, plug-in hybrids in particular, and they get charged at night, there would be load matching to the energy storage of that hybrid vehicle to the wind energy. So, they would have some outlet to charge at night for that extra renewable energy.

AUDIENCE MEMBER: So, it is an increase in demand, but it still does not really shave your peaks during the high times?

MR. PENNEY: No, but it could. The vehicles themselves could shave their peak, if there was V2G such that the utilities could take advantage of your battery. But the issue there is what is that going to do to the life of your battery and who is going to warranty that if the utility starts using your battery in and out, there is always a concern that that is going to wear out the battery quicker.

AUDIENCE MEMBER: Gerald Karey for Samantha. I think you mentioned, you said there are 115 ethanol plants now under construction in addition, and did you say that there are perhaps thousands more that might be built?

MS. SLATER: There are 115 plants online today, 79 under construction, seven expansions. Depending on who you talk to, you could walk into any state and people would be talking about hundreds of different proposals in various stages of people are just talking, they have started trying to get permits, and we do not track those. So, I do not know what the number is.

AUDIENCE MEMBER: It sounds like a California gold rush mentality. Is there a concern of overbuilding?

MS. SLATER: I think that the market forces, obviously the price of corn, the price of natural gas, the price of stainless steel, it takes a lot of stainless steel to build an ethanol plant, and we are competing for that stainless steel on a global level, India, China, Japan, there is a huge market for stainless steel.

So, I think there will be several market factors that contribute to keeping that boom cycle where it should be.

AUDIENCE MEMBER: So, it is driving up the cost of stainless steel as well as the cost of ethanol?

MS. SLATER: Yes, the stainless steel market, I haven't checked lately, because I have one of our producers was telling me late last fall that something

like the price of stainless steel had gone up seven to eight percent every month for that six-month period of time. So, the world demand for stainless steel is quite high.

MR. SEESEL: John Seesel, FTC. This is probably more directed to Samantha, but other panelists might have thoughts about this. We have talked a lot about sort of the pressure on the corn crop with ethanol production and the ramp-up in production, and on what has to happen for cellulosic ethanol to kick in.

In order for the country to achieve the 35 billion gallon per year goal that the administration has set by the year 2017, what kind of steps do you think have to be accomplished in order to get there, and would it involve relaxation of import restrictions and things like that?

MS. SLATER: Whether you use the 35 billion gallon by 2017 or let's add 100 million gallons or Harken 60 or Bingaman, Domenici 36, no matter what number you throw out there, they are all very large numbers. And what we are looking at from corn is, you know, about 15 billion gallons.

Now, you look at what companies like Monsanto and Syngenta and Pioneer are working on as far as biotech hybrids go. Monsanto absolutely believes that

we can get to 300 bushel per acre corn by 2030. Thirty years ago we were at 84 bushels per acre, today we are at 150, 152, so that is absolutely within the realm of possibility.

You saw acres go up, they announced on March 30th, 90.5 million acres of corn expected to be planted, that is about 83.5 harvested, so a 12.4 billion bushel crop, given nice weather. Regardless of all of that, it will take cellulose. It absolutely will. There is nobody who believes anything differently.

How quickly cellulose can come on and at what numbers and when, nobody today could tell you. It will depend on a variety of things. All of our producer members are working on their own cellulosic research in some shape or form. The six DOE competitive grant awards that were given out a few weeks ago, all of those award winners are RFA members. They are all working on beginning their demonstration pilot scale facilities, getting those up and running so that the marketplace can take a look at these technologies and feedstocks, and start to determine which is more feasible than another, and let experiment begin to happen.

So, what our producer members are looking at are the loan guarantee programs, they are looking at the competitive grant programs, in their opinion, those

would be making sure those programs are fully funded and are fully funded for years to come and making sure those programs, like the loan guarantee program, actually happen is their priority.

We believe very strongly that lifting the tariff today would not solve the problem. How much ethanol Brazil actually has to export, could not tell you right offhand, and I do not know that they could. Certainly there is a growing global market for ethanol, and they have demand from other places, and they have other markets to sell it into.

So, that growth, no matter what, certainly needs to happen here, and it needs to happen from something other than grain, and so focusing on getting the cellulosic ethanol market up to commercial scale as quickly as possible is certainly where the priority should be.

MR. PENNEY: If you go on the DOE website, NREL has been involved, as well as OakRidge, have put some teeth into the metrics behind how to reach those goals in 2010 in particular. So, if you go to the DOE website, you will see that.

AUDIENCE MEMBER: Peter Rohde with Energy Washington, another one for you, Samantha. You talked about an E-20, E-15. I was wondering if you could just

walk us through kind of the roadmap for getting there, and the reason I ask is because of the announcement they made yesterday on the renewable fuels standard. I asked Administrator Johnson about the Minnesota waiver, they want their E-20 blend, and he said they haven't begun testing yet.

MS. SLATER: They have, actually. We are doing that testing with them. The testing is not complete. RFA and the state of Minnesota are doing an E-20 study. It is not my area, I do not staff the technical committee, but the technical committee is the one who receives the much more frequent updates than I, but I believe they might have some preliminary results, I want to say July, do not ask me why I want to say that, but the state of Minnesota and RFA are currently engaged in an E-20 study. That is the only study that I am aware of, however, and it certainly would be the first of its kind.

If you look at the Bingaman, Domenici bill, they do have a provision for a study for higher level blends which we applaud and certainly believe that there needs to be more study and we are in the very preliminary studies of beginning to talk to certainly EPA and Congress about moving to higher blend levels like E-15 or E-20.

AUDIENCE MEMBER: Best case scenario, what do you think the timing would be?

MS. SLATER: Certainly conversations, you know, obviously the oil industry has a big say in that, and the auto industry as well. So, when I say preliminary, I mean it is very preliminary. So, it would be a years long process.

AUDIENCE MEMBER: Thanks.

MR. WINSTON: All right, I think this is 10:45 is the break time. I found this encouraging, since there wasn't too much call for active government and the advocates of ethanol and technology were willing to allow the chips fall where they may. So, there we have it. Thanks to the panel.

(Applause.)

MR. SEESEL: Thanks to Cliff and all the panelists. We are going to be on a 15-minute break and resume at 11:00 on New Frontiers of Energy.

(Whereupon, there was a recess in the proceedings.)

PROFESSOR WOLAK: Sorry about the delay in starting, we have to get government approval to actually connect a laptop to a monitor here.

MR. GLAZER: And this is the technology panel.

PROFESSOR WOLAK: Yeah, but it is not about the

technology, we know how to do that, the problem is the IT permission. So, we can wait.

So, welcome to the New Frontiers in Energy Session. Our first speaker is Thomas Orvald from Heller Ehrman. Take it away.

MR. ORVALD: Good morning, folks. Can you hear me?

My name is Tom Orvald, I am from the law firm of Heller Ehrman, I work in D.C. here. I am an energy regulatory attorney, I have been at it for about five, six years, and I also work with a sort of an interdisciplinary group in our firm that has been tracking the energy and clean technologies sort of slice of the industry pretty closely for about two, three years. We represent a lot of the companies that are developing some of the new technologies, as well as some of the banks and the venture capital firms that are starting to invest in these companies.

Today I am going to provide just a pretty straightforward survey of the what Daniel Yergin has called the bubbling of technology along the energy spectrum. There is just a dizzying amount of exciting things going on, and I will just jump right into it.

I would like to start by pointing out how phenomenal the opportunities are in this area, and

reminding everybody that the markets here are truly global in nature.

We like to think of domestic U.S. consumption when we think about this technologies, but the markets truly are global and it is becoming more and more apparent every day.

As we see it, the development and financing of these technologies is being driven by four factors, including basic market fundamentals, how they compete, apart and aside from government subsidies. Then later on the regulatory policies and the incentives. And then there is also a sense that over the last 10, 15 years, there has been a lot of intellectual capital and knowledge about these technologies that just has not been tapped, and it is starting to be tapped, and that is maturing technologies and the costs are starting to decline. And then we have got the coming prospect of carbon regulation on the federal level, as well as some state initiatives that are proceeding full head of steam.

In my practice, I do a lot of work for investor-owned utilities. So, a lot of my perspective will show through. When I look at these emerging new technologies, I see it through the eyes of the utilities, which are conservative by nature, and here is

a list of some of the things that they are having to deal with on a day-to-day basis these days when they consider investing in either power purchase agreements with firms that are creating renewable energy or going out and doing it themselves.

They have got the fuel costs, the complications of these markets, tax treatment and credits. Even national security issues that have layered costs onto their cost of doing business. The list continues here.

For some utilities, I think it is increasingly the case, I think it depends on what part of the country you are in, but their reserve margins are starting to decline and they are out there looking for new generation, and when they look at renewable and even outside renewables, just new technologies, including advanced coal, they need to know that they are going to be able to recover these costs, and the calculations are getting difficult.

You have got the renewable portfolio standards. This is one of our firm's hobby-horses. We would like to see ultimately a federal renewable portfolio standard. I know it has been proposed and it has not actually gone through, but in our ideal world, you would have a renewable portfolio standard on the federal level that set a floor, and then the states could either adopt

that minimum standard or they could adopt ones that are more stringent.

The other thing with renewable portfolio standards is we would like to see them be technology neutral, focused on the production, and if you look at the states, I think there are at least over 20 states in the country now that have portfolio standards, and each one of them are a little bit different, and some of them actually exclude certain technologies all together. We would like to see that improved upon.

Starting with wind energy, this is the clearest case, anybody that has driven around the country is starting to see them pop up. My fellow panelist here, Rob Gramlich, will correct me if I get any of this wrong, he is from the American Wind Energy Association, but as we see it, wind generation has arrived. Utilities are purchasing the power produced by these plants. Turbines are sold out. The production tax credit plays a huge role in the financing of these plants, and this is another legislative issue that we have come to focus on.

The tax credits have been treated sort of, what is the word I am looking for, sort of mercurial. They do not extend them out very long, and it complicates the emergence of the business, and what we ultimately would

like to see is maybe a somewhat longer term approach that puts the tax credits in place for five, 10 years, and then slowly tapers them off. Just something so you can have some reliability and some certainty.

Ultimately, obviously, the technologies that are going to make it are going to have to succeed on their own, but we think it makes sense at this time to allow them to have some subsidies to get the cost down and improve themselves.

Again, this is a global marketplace. You are starting to see competition from Asia in the wind turbine market, and the Holy Grail for wind energy, we talked about this a little in the previous panel with respect to hybrid vehicles, but the Holy Grail is dispatchable wind power. So, ultimately, you could have renewable energy available for storage and sale during peak hours.

Moving on to solar, our firm does a lot of solar energy work. Business is booming in California, and that is where most of our work is focused, although it is happening throughout the country. I mention here on the slide, there are just two enormous fascinating projects in California. The second one listed there, the Sterling Engine Systems is just an incredibly futuristic project, if you get a chance to Google that

on the Internet, it is just an unbelievable thing. I am not an engineer, so I am not going to describe it in detail, but just the look of it is astounding.

In northern California, PG&E has entered into a 500 megawatt purchase agreement for a solar thermal generation project. One of the reasons things are booming in California is they have a distributed generation, a very full, robust distributed generation program. I refer it to here as the SGIP, it is the Self Generation Incentives Program, I believe, and they have layered on top of that some additional incentives for solar.

The renewable energy certificates market is picking up, as well as in the investment tax credit playing a big role. On the renewable energy certificate, that is another issue we would perhaps like to see some legislative action, or at least we would like to see the formation of some stronger markets for those reqs. Right now it is a little bit ad hoc, and we would like to see that improve as well.

Ultimately, like I said, for solar to compete without subsidy, the costs are going to have to come down significantly.

I would like to shift gears away from the two major renewables, and look at coal. It is just a

reality that the United States and China, 70 percent of the world's coal supplies, somebody in the last year has called the U.S. the Saudi Arabia of coal. It is just true. It looks like we are going to have to figure out a way to use the coal.

One of the options, one of the insurgent technologies is integrated gasification with combined cycle. These are huge projects that are being advanced by competing consortia in the U.S., China and Europe.

The next thing I would like to point out, I just discovered this when I was putting the presentation together, but it is petcoke, and this is a BP has a one billion dollar 500 megawatt project, hydrogen project in California. This is not coal, but this is taking the -- what is the word I am thinking of?

AUDIENCE MEMBER: Residue.

MR. ORVALD: -- the residue from the refineries and creating hydrogen from it and then injecting the carbon dioxide back into the ground. It is a very advanced project, and I was just amazed to see it. But I think that it actually fits with one of the trends that is starting to happen in this area, is the increasing sort of hybridization of the technologies. Once one gets the cost coming down, then you start to be able to use it, you start to be able to build on it in

hybrid ways.

There is also a second generation coal gasification that may be coming to the fore, and banks are starting to finance these companies.

And the final issue with coal that you cannot escape mentioning is the need for carbon sequestration.

Other technologies of note, these are not going to be any surprise, we have micro hydro technologies that are happening in smaller rivers throughout the west. Geothermal is out there, it is improving. Biomass, ocean and tidal waves, they have a very organized group here in D.C., I am on their list, and they are lobbying away, and their projects are being funded and demonstrated.

Nuclear, I am not going to say much about that, it is not my area, but sooner or later, if we are going to confront the global warming, it is going to have to come.

Energy efficiency, I say promising but complicated. We could have a whole discussion about it. The problem, as I see it, is as things become more efficient, people tend to use them more.

Fuel cells: When I first started working in this area about five, six years ago, this was the first technology, energy technology that I came upon, and I

thought it was going to change the world, in the span of a couple of years. That did not happen. It is still bubbling along. Its time will come. There is going to be some very site-specific applications. I think it is already being used in ways for back-up power, and its uses might improve.

Fuels: We have covered this ad nauseam this morning, so I am not going to go through it all, but I would just like to mention that it is another area of great innovation.

I will finish my presentation by just reiterating the global aspect of these markets, and if you look at the chart there, it shows that global demand for electric power over the next 30 years is going to double. That is a huge opportunity, but it is anybody's guess what the mix of technologies are that are going to lead to that increase in demand.

Thank you.

PROFESSOR WOLAK: Thanks very much. The next speaker is Craig Glazer from PJM. I thought what we would do is go through all the talks and open it up for discussion. So, take it away.

MR. GLAZER: So, can everybody hear me here? Great.

Well, this is a technology panel, and I am here

as a lawyer talking about technology, which is always dangerous, but before we get into that, because I do want to spend some time on technology.

Before we get into that, I think I would like to take a moment of personal privilege, if the moderator will allow me to, to sort of step back and frame the question in terms of where the industry is today, and where it was some years ago. Because we heard a lot yesterday about the restructuring of this industry. It did not work, it was a failure, what did we do this for, et cetera, and implicit in all that was sort of this pining for the old days.

Well, I guess I am old enough to remember some of the good old days, and I thought it best to sort of have all of us sort of step back to some of those good old days.

I would like to do that by a pop quiz. Could anybody name the fictional character and movie that this scene was from? You can probably date yourself by doing so, but can anybody name it? Too young an audience here. Yes, in the back?

AUDIENCE MEMBER: Is it Network?

MR. GLAZER: The movie is Network. Can anybody name the character?

AUDIENCE MEMBER: Howard Beall.

MR. GLAZER: Howard Beall. Wow, no one has ever actually gotten that. Congratulations to you. You get a drink for that, special.

(Laughter.)

MR. GLAZER: Yes, in fact, this was the 1970s movie Network, and the fictional character was a gentleman by the name of Howard Beall. Howard Beall was the newscaster on the 6:00 p.m. news on a failing TV network. It was down in the ratings, it was losing market share, losing sponsors, and one day Howard Beall does something totally outrageous. He gets on the 6:00 news, and everybody is expecting him to read it, he throws away his script, and he starts ranting to the audience, just like you see in this picture, about everything that is wrong with America, from the breakdown of the family to environmental degradation, to corrupt politicians and he is going on and on and on working himself up into this frenzy that you see. He conclusion by imploring his audience to go to their windows and go to their doors, remember this, and open them up and yell out, we are mad as hell, and we are not going to take it anymore.

Suddenly, one person in the city, you hear, opens their window and starts yelling out, we are mad as hell and we are not going to take it anymore. Then two

people, then five people, then 10 people, then an entire city is screaming at the top of its lungs, we are mad as hell and we are not going to take it anymore.

In fact, I would posit to you, as we pine for those good old days, that that is exactly where this industry was back in the days before restructuring. We had customers of all sorts, and utilities and regulators and others screaming, we are mad as hell and we are not going to take it anymore.

Quite frankly, there was a lot to be mad about in those days. I actually got my start working for a municipal utility, and in those days, you couldn't go to a tariff to get transmission access, you had to negotiate this thing called wheeling rights, and you had to bring various lawsuits to argue discriminatory treatment, and the cases took so long. There actually was a federal doctrine known as refunds to a corps. The problem was you would probably be out of business by the time the FERC ordered refunds.

In fact, I think we brought a price squeeze case, I think is still pending at the Commission from about 1972, for example. Cases went on and on and on, and the Commission had great difficulty resolving these issues.

Build-out costs were very uncertain. You got a

bill from the utility, there was no transparent planning process, you didn't know, just you want to interconnect, here is the cost.

From the wholesale perspective, unfortunately, and this is perhaps one of the saddest parts, very important terms like reliability and native load. Today, we value those. In those days, when somebody said reliability, that generally was code for we are not going to do this, okay? We do not want to give something to our competitor.

Those very important terms sort of got cheapened, if you will, and became sort of an anticompetitive tool. We had TLRs, we had demand ratchets, price squeeze, you name it, and that is just at the wholesale level.

At the retail level, we had rates significantly above the national average, we had industrial customers screaming about public interest programs that they were being asked to subsidize. We had investment stagnation, utilities saying I am not going to go through these prudence reviews anymore, I am not going to get disallowances, and we had a lot of hits. Electricity prices became a hit to global competitiveness and it was a state-by-state challenge.

Well, the challenges that we had then were not

limited to that. We also back then, and continue today, to work with this incredibly complicated patchwork structure. You would not run, you would not design an industry like this.

For one, the physics means that the system operates as really one big machine, one in the eastern interconnection, one in the western interconnection and one in Texas, but it cannot just operate as a machine, because we have a history of individual utilities, a history of local practices, state-by-state regulation, utility-by-utility planning. Add on top of that individual control areas that operate independently. We certainly had a lot of those in the 70s and 80s, and on top of that, a regional reliability structure that did not necessarily match the state boundaries or even the utility boundaries.

Add on top of that regional markets run by RTOs, and you had sort of a recipe, if you will, for confusion, a recipe for gaming, and a recipe that would discourage the type of innovation and investment in technology that we are talking about on this panel.

So, those are a little bit of the good old days, and what we need to do about the good old days, and I would like to posit that we have actually, before we beat ourselves up about what we failed to do in

restructuring, we ought to take some credit for having gotten some things right. I believe we actually did get some things right.

That being said, there is a lot of things we did not get right, and we could learn from them, and most of all, I will close with avoiding the quagmire of an action.

Let me briefly start with what I think is sort of the hidden story of what we actually did get right. I would like to illustrate this through a story as well. I was a commissioner for the Ohio Public Utilities Commission in the 1990s, and back then, in 1990s, actually before then, 80s and 70s, you would be a commissioner on the state commission, it would be a Friday afternoon, you would be sitting at your desk planning out your weekend, everything's quiet, and suddenly the phone would ring, and there on the other side of the phone is the CEO of your local utility, saying Mr. Chairman, we have got a problem. Mr. Chairman, our bond ratings are down, that nuclear plant, not our fault, but costs are going out of sight associated with that, our customers are rebelling. Mr. Chairman, Wall Street is going to downgrade us on Monday morning, we need your help. We need an emergency rate case, we need a bail-out. Okay?

You hang up the phone, that just ruined your weekend, you know that is coming, and suddenly you are faced with a dilemma, a dilemma that I would argue that no state official should be faced with. On one hand, gee, rates are already high, customers are already screaming, as we mentioned before, and here the utility is going to file an emergency rate case to raise them yet again. Can I do that to the residential customers, but can I do that to the industries in my state?

On the other hand, I have got a major utility, can I have that utility fail on my watch? Fail on my governor's watch? Suddenly, you found yourself in this impossible dilemma.

Well, think about sort of the unanswered story, the unknown story of restructuring, is that we actually moved the risk allocation formula. For all the problems of Enron, there was no bail-out of Enron. There was no phone call to the chairman of a state commission saying I need an emergency bail-out of Enron.

That is absolutely significant. Sort of not recognized. A lot of people got hurt in Enron, but we did not have an immediate increase in rates going to customers as a direct bail-out. That shift in the allocation formula I think is very, very significant.

Perhaps my best illustration of that is this is

a graph showing the PJM wholesale market, both before and after the Enron collapse back in 2002. What is interesting is, the market barely had a blip. It actually recovered very quickly, other people stepped in, and the market, which obviously was well functioning, but there was no bail-out transfer of wealth, if you will, as a result of that collapse.

If anything, we have seen higher commodity prices, but we may have seen capacity prices too low, but one thing we haven't seen, as I mentioned, is that bail-out.

Some other things I think we got right, and consequences. Market heat rates, the heat rates of our units are significantly declined. The units are much more efficient. I don't think anybody has contested that. We actually, if you adjust for fuel, prices have actually gone down in the PJM market, and I believe that has gone on in other RTO markets as well.

So, I like to think that we actually got some things right, and we sort of forget that. I also think we got some of the fundamentals right. For years in the regulatory world, we have lived through this dilemma, should we have regulatory solutions, should we have behavioral solutions, should we have structural solutions. We went through this in natural gas, we went

through this in telecommunications, we are going through this in electricity.

I think the proof of the pudding shows that structural solutions have worked. We eliminated those multiple control areas. The system is more reliable today because we have one operator, as opposed to 10, 15 operators in the midwest, in PJM, in many, many parts of New England, et cetera.

We have regional planning, something we did not have before. We have redispatch in lieu of transmission line loading relief, and I think we are maximizing uses of the grid in ways we never did before.

I will not spend a lot of time on statistics, this is just a little information about the size of our market. It is one of the largest markets in the world. The other most important part of it I would I would like to point out is sort of the transparency of the market. I happen to live, people forget, the first set of price spikes were not in California, they actually were in the midwest, in the mid-1990s.

I remember sitting at any desk at the Ohio Commission and different industrial customers would call me, saying can you locate power, what do you hear of the prices, what do you hear of the prices. There was no central place to go to find out what the price of

electricity was.

This is an illustration of what we call e-data, you can call this up on your computer and you can see it is almost like a stock ticker going past and showing the price of electricity every five minutes. I wish I had that in the 1990s when our industrial customers were suffering, when the market was churning as a result of in that case a lack of transparency and lack of good information.

So, those are some of the things I think we got right, but I am not here to say we got everything right. For one, we cannot ignore the basics. That comes through. Trees, training, technology. Things that tripped us up in the black-out of 2003, and I will come back to specifically technology.

We need to better align wholesale and retail rates. I am not sure we have ever figured that model out that well, and that is another whole discussion that we will not get into at this point.

Demand side response, it can have an equal footing in the marketplace, and I think it is all of our jobs to make that happen. Lesson four, which I want to get to, we need to sort of build the smart grid of the future. We are spending a whole lot of time talking about putting wires up in the air for increased

transmission, there is a need for increased transmission, no question there is. We are busy working to get some new transmission built, including just west of here in Northern Virginia.

But that being said, we have got to start thinking about this a little more holistically. We cannot build our way out of this problem. We have to use the existing assets in a whole lot smarter ways than we are doing, and that, I think, is sort of the promise of the smart grid of the future.

I mean, today if you look at the grid, it is really one directional. In our case, the RTO provides and receives transparent information from market participants and grid member. We send that information down the line to the load-serving entity, your local utility, but the information really does not get beyond that.

I like to tell the story, in your refrigerator is a defrost cycle, automatic defrost cycle, wonderful thing to have for anybody who used to chip refrigerators. That defrost cycle could happen at 3:00 in the morning, or it could happen at 5:00. It just has to happen, but it does not have to happen at any particular time. The appliance has no way to communicate back to the grid so that it and its user can

make an intelligent decision. Defrost cycle, it just has to happen at some time. It is totally optional when it happens within a 24-hour period. Again, a smart grid and smart appliance would avoid this sort of one directional information and then provide that two-way protocol and two-way exchange.

So, we, in fact, are proposing, and we have just issued a strategic report, and I have left copies of this brochure, because we are trying to explain this concept. People throw out smart grid, it is kind of difficult for some people to get their hands around it, and there are copies of this out front.

The smart grid environment that we are contemplating envisions digital automation of the entire power supply system, from generators to consumers, really to improve reliability and efficiency. It would be an open architecture system, it would be a plug and play technology, and here I think we borrow from the telecommunications industry. The telecom industry and the FCC championed open network architecture back in the 70s. We never did that in the electric industry.

We are still fighting about energy efficiency appliance standards at the DOE now for the past 10 years. We have never taken that holistic look at opening up this grid. That is very much what the smart

grid initiative is all about. Removing the disincentives, encouraging transparency.

Perhaps the best example of it is today we operate the grid by keeping supply and demand in balance at all times. It is sort of a static process. It is coming up on the next hour, look at our supply, look at our demand, keep it in balance.

The smart grid is doing this in realtime, but also doing this with all the different pieces working together. From that defroster in your refrigerator all the way to the power plant. I like to view it like a spinning top, that you have to keep the spinning top in balance as opposed to the more static scale, because in fact, all of those appliances should be moving, should be communicating, in an organized fashion.

There are lots of barriers to development of the smart grid. We need the help of the FTC and others to make this happen. There is institutional stagnation of the status quo. There is regulatory criteria. There is lack of common architecture, quest for capital, et cetera. But we cannot just wring our hands about this, we spend a lot of time in this industry wringing our hands. We are a nation of 50 states. We will have to get over that, we will have to make this work within that environment. We think we can if we have a common

vision of moving forward.

Which brings me very, very quickly to my last point, which is ensuring that we have a common vision. There is a little place along the Pennsylvania Turnpike called Gravity Hill. I was actually traveling with my family about a year ago. This is one of those places where you turn your car off at the bottom of a hill, and the car actually miraculously, and I will leave it to the engineers to tell me if this is the result of magnetism or optical illusion, but the car starts moving uphill. If you have ever seen one of these. And it is a real, live place.

We get to the bottom of the hill, we turn the car off, and suddenly the car is moving uphill, without any propulsion. We are really excited about this. When we get to the top of the hill, somebody tells us that, hey, you like that one, there is another hill about a half a mile down. So, we said, oh, we got this down, we drive to the second hill, get to the bottom of the hill, turn the car off and the car again starts moving up hill.

This time, this time, the car only got about halfway up the hill and sort of petered out. We sort of were stuck there. It couldn't go forward, it couldn't go back, we were just sort of hanging there in mid-air.

I said to my family, I said we are in a very dangerous place. One is I cannot move forward and I cannot move back, but two is a semitrailer could just come right over that hill at any minute and hit right into us.

That, ladies and gentlemen, is where I posit my greatest fear, is that is kind of where the industry is today. We cannot move forward, we cannot move back, we are kind of hanging there, and if we are not careful, a semi truck is going to come over that hill.

So, our job, our collective job is to make this restructured industry, including technology, work so it does not become a golden memory of yesteryear.

Thank you very much.

PROFESSOR WOLAK: Thanks very much. The next speaker is Rob Gramlich.

MR. GRAMLICH: Thanks, Frank, and thanks for being here. It is a privilege to be back talking to the Federal Trade Commission. I used to work pretty closely with John Seesel when I was at the Federal Energy Regulatory Commission and had some responsibility for competition policy, so I must say I miss doing Herfindahls and all of the other antitrust-related analyses.

I always appreciated when I was there at FERC, FTC's role. I think there was a big void that was

really only filled by FTC in terms of competition advocacy and the structures you need to make competition work in the electric industry that we were trying to work on, and I think that is as true today as it ever was, and in fact, more true, if you think about energy policy going forward and how market-based our energy and environmental policies have become.

We have got tradable permits, we have got renewable energy credit, trading markets, the carbon market is going to be a huge global market. It is going to be a market not just in this country, but everywhere, and there is a lot of potential for false advertising, and false projects, and all sorts of issues that FTC is really I think the nation relies on a good competition regulator to make all these markets work well. So, I think this is timely and relevant.

I am going to talk about wind energy, and energy markets, especially these market-based energy-related markets, because I think there is a strong connection there that is very interesting, and is not widely recognized.

Generally about the wind energy industry, you have heard it a couple of times today, we have got about 60 gigawatts worldwide, around 10 gigawatts here in the U.S., growing at about almost 30 percent per year. So,

I have been in the wind industry two years and it has more than doubled in size in that time. So, either I am really good or the product has a lot to offer.

It is also very different from what people think about, it is utility scale, and I will show you some pictures here if we can get this going, but these are hundred meter high turbines that you have probably seen on the highways. There is also a small wind market, but I think probably 99 percent of the megawatts are the large wind farms that really utilities are looking at and integrating into their systems and increasingly becoming owners of, and they fit well into the broad utility portfolio. I will talk a little bit about the electric market system and how that fits together.

One thing I would like to emphasize is that wind energy does not need storage. We have got 10 gigawatts now, and none of it, none of those projects, to my knowledge, are relying on batteries or other ways to store the wind when it is producing to sell it at peak times.

The way the electric power system operates is you have generators all across a wide regional area that are being ramped up and ramped down by Craig's organization and others like them, across the country, and so this generation of load portfolio, and the smart

grid moves us much further in that direction, is the way to balance the system.

So, you do not need to balance the wind output, what you need to do is balance the system, and any utility system operator knows that and that is just not even a question. So that is how the system operates.

Some day, plug hybrids would offer a great opportunity to connect the transportation sector and the electricity sector, and that would offer a whole lot of storage to, I think, vastly increase wind and other renewable resource penetration. But again, that is far off, and you do not need it for today.

Wind energy technologies developed quite a bit, it now supports reliability. You have heard something about interconnection issues and Craig's issues when he was trying to get transmission access. Well, now there are nationwide rules on the voltage and frequency and other standards you need for wind energy, and all generation. So, that brings down barriers to entry for new technologies and other market-related policy that FERC implemented.

Wind also, one of the great sources of its popularity is the rural economic development potential. Almost all of the wind being developed is on farms and ranches, and in all of those cases, you can get just as

much agricultural and ranching, you know, output of the land area. So, it fits very nicely with existing land uses.

Wind is now, at current levels of penetration, it is reducing natural gas demand by five percent, which is taking a lot of pressure off the high and volatile natural gas prices, and every megawatt of wind that you put on the system displaces something, depending on the region. It could be coal, which would, you know, in that case, reduce a lot of carbon. It could be gas, which would reduce some carbon, but also natural gas demand.

The President said last year that areas with good wind resources have the potential to supply up to 20 percent of the electricity consumption of the United States. That is a vision that we are evaluating. Certainly we have gotten over 20 percent in some utility systems here and we have got over 20 percent in some countries in Europe, so there is no technical barrier to doing that, it is just how much do people want to buy and what are the incentives that policy makers put out there. We will talk some about the policies coming up.

My next three slides are really pretty pictures that I can describe to you. I can come back.

I actually have a couple of things I need to

read to you. To make this point about renewable energy and energy markets, there was a letter from 22 renewable energy and demand response advocates and companies to FERC, copied to members of Congress, that says, "Because renewable energy and demand response resources benefit America's economy, environment and security, it is vital that we have the institutions and rules necessary for them to thrive."

By the way, I think Betsy Moler might have read some of this yesterday in her presentation. And the quote continuous, "In particular, independent regional transmission operators, such as regional transmission organizations and independent system operators not only can promote electric system reliability and wholesale competition, they can also facilitate renewable energy and demand response development."

So, to explain a little about why that happens, it is really a technical issue about, again, how the grid operates, where a whole bunch of generators and load across a wide area dispatch against each other. This was explained by a paper by the Utility Wind Integration Group, written in coordination with representatives of the entire U.S. electric industry, which is the investor-owned association, the co-ops and the municipal associations, and their statement is,

"Well functioning, hour-ahead and day-ahead markets provide the best means of addressing the variability in wind plant output. Consolidation of balancing areas or the use of dynamic scheduling can improve system reliability and reduce the cost of integrating additional wind generation into electric system operation."

So, I mean, picture the language in English, what this means is, you know, picture like a small pond, and you dump a rock into the pond, it creates big waves that ripple up against the shore. Similarly, if you have a lot of wind in a small utility system, that variability makes a big impact, and the system operator's going to be scrambling for other resources to balance overall load and generation.

So, now let us take that pond which happens to be connected to a whole bunch of other ponds, we have 140 control operators around the country, there is no reason why we couldn't consolidate those down to three so that we have three huge great lakes. You drop the same stone into that great lake, it is barely a ripple. You do not notice it.

You could have, you know, 20 percent or more electricity coming from wind in that area and it is not a problem at all for the system operators. And that is

what Craig Glazer's president goes around and says about their system. You know, their system operators would need a whole lot more wind to even notice any variability problems on their system.

And they operate the biggest control area in the world, and we hope that other operators make that change and operate larger systems.

Let me show you my pretty pictures here. This is sort of the -- this is the wind supply curve of the country. 800 gigawatts is the far end. That is about as much generating capacity we have operational of any sort in the whole country, and so we have got that much wind available at $100 a megawatt hour, which is not that high given future forecasts with carbon prices and all that factored in.

Now, that is at the outer end. The lower hanging fruit is a lot cheaper than that, and in order to get a lot of this, you are going to have to build a fair amount of transmission to get it out of the places where the wind is.

This map is our sort of an initial cut at where we think the wind resources would be developed under a 20 percent wind scenario. The dark states where a lot more wind would be, you can see California, Texas, Oklahoma, Iowa and Montana and South Dakota being big

areas. Now, you know, that is not where the people live, so you are going to need a lot of transmission to get to this wind resource.

This map shows, again, the darker purple colors are where the high wind areas are, and the blue lines are some of the transmission lines that we are working with utilities to move forward.

Transmission is, as Craig said, there is sort of a renaissance in transmission. A lot of people are building it now. For like 20 years they did not at all. It is coming back, you know, it is only 10 percent of the end user's bill, so building a lot more transmission does not necessarily increase retail end user rates that much, and there are massive economies of scale. I mean, for a 765 KB line, you can get two and a half to three times as much power as a 500 KB line. So, you know, and these wind resources are not going anywhere. Your great grandkids will look at this same map and if we build the transmission lines now, it will probably still be there getting power out of these areas. So, we should, I think, look at energy policy and the time frame that global warming really requires, which is that long-term time frame.

So, a couple of I guess final notes on the connections between markets and renewable energy policy.

If you are into wholesale electricity markets, this is kind of into the weeds in that area. But there are two sort of worlds that are operating, the regional transmission organization world, like Craig's PJM, and then there is a non-RTO world in much of the west and the southeast, and basically the upshot of this is that a whole lot more wind can be operated in the RTO world because it is more of a pool-like system with those large pools of generation and load working together.

There is one very interesting study that just came out, the Minnesota Public Utilities Commission and legislature required a study of wind development in Minnesota, looking at 20 percent wind for that area. They actually did the same study this year as they did three years ago, and found that they could get twice as much wind energy for the same reliability cost impact as three years ago. The difference was that the utility there joined the midwest independent system operator, one of these large regional pools, and so suddenly now you have these flexible generators across a 15-state system that can all respond to variable wind output. So, just a couple of strokes of a pen and some regulatory proceedings, and bam, we can get twice as much wind energy for the same cost.

Then, a couple of other market-related

connections with renewable energy policy. There is a whole lot of trading going on and renewable energy credits. These are both for the purpose of complying with mandatory state renewable portfolio standards, and for the purpose of voluntary markets. If you go to Starbuck's or Whole Foods or any places like that, are a lot of companies are buying renewable energy credits in order to be sort of carbon neutral in their operations, and so that national voluntary market is becoming very big and popular. So, there is a big connection, again, with making markets work effectively and robust markets will support renewable energy.

Emissions markets are nothing new, we have had stocks trading for a long time now. I guess most of the talk about future global warming and carbon regulation is around a cap and trade system where you would be trading carbon credits, so a robust market there could very much help wind energy and all sources of renewable electricity and fuels.

Finally, there is a utility green power program that is pretty active. My last slide shows the green states, which is almost all of the states have some form of program where even if it is a monopoly utility and no deregulated market, you can sign up with your utility and buy wind power for your home like I do, or buy some

kind of green product. The issue there is you have kind of got to get people over this idea that you are buying it contractually. They cannot deliver certain electrons to you from those resources, but all electrons mixed together on the grid, but that is the basic structure of how they work and they are very popular in a lot of these states and they are really taking off.

So, that is my presentation, thanks a lot. I do think, again, there is a strong connection between markets and renewable energy policy, and I am glad that the FTC is active in this area. Thanks a lot.

PROFESSOR WOLAK: Thank you. Now I have the task of controlling myself. So, what I thought I would talk about is one of the big issues is just the fact that in the future, the big issue that will have to be dealt with is this question of controlling greenhouse gasses and certainly renewable portfolio standards and emissions caps are two tools for limiting these greenhouse gas emissions, and each has different, sometimes conflicting, impacts.

So, what I would like to do is sort of go through an example of California and talk about these two policies there, and how essentially is an example of kind of state level policies for dealing with these two issues, and talk about how coordinating a cap in trade

with an RPS standard might work or why you would want to have both.

So, just to give you a little background on California, by 2010, California has promised to essentially provide 20 percent of its energy served by the investor-owned utilities from renewable sources. By 2020, up to 33 percent. It is debatable whether any of these things will be met, but that is what is on the books.

The way that RPS is implemented is that the California Energy Commission will certify the eligible renewable resources and it designs and implements a tracking system. Currently there is this voluntary tracking system where with the Western Renewable Energy Generation Information System that essentially tracks these resources, but in order to qualify for the RPS, you have to be certified in the database.

Then the CPUC, California Public Utilities Commission, essentially worries about the issue of a market price for nonrenewables to know how much to pay for renewables, because to the extent that there will be above-market prices necessary to sign the renewables to contracts to get them to supply energy.

The other is obviously the CPUC does impose penalties, the issue here is that penalties, at least at

the moment, are not that Draconian, and so in that sense is the real issue as to whether or not these standards will be met.

So, here is just a snapshot of where the renewables are kind of thought to come from, and good news for Rob, roughly 4,500 megawatts of capacity in wind. Interestingly enough, almost 4,000 of that 4,500 is going to come from one specific area, this area in the middle of the Tehachapi and the Mohave Desert, much of the other places have existing resources, as does Tehachapi, but Tehachapi is a particularly sort of photovoltaic, if you like, wind location.

And the other issue is now if I am a renewable generation owner, how do I actually sell energy? This gets to an issue that Rob talked about with respect to California runs a formal market, and so the two approaches that historically renewable energy generators have pursued is to become a participating generator to an owner in the California ISO control area, or remain an embedded generator. Most of these that remain embedded generations are holdovers from qualifying facilities under the PURPA regime, and effectively the CPUC is requiring all generators to sign PGAs. So, in other words, the first approach for all new units.

Now, the other is that California runs, for

those of you who are the electricity folks, it runs a multi-settlement market, and what this means is that resources schedule a day ahead and then operate in realtime and are liable for deviations from their schedule. So, for example, as I said right here, I am a wind resource, I schedule 50, I produce 55, I pay the realtime price for the additional 55 megawatts that I produce, and if I schedule 50 and produce 40, then essentially I pay the realtime price for the 10 megawatts.

As I said, the unpredictability of these resources can expose the owner to significant imbalanced charges on an hourly basis, and so what has happened in California, is to develop the so-called participating intermittent resource program, and the way this works is that if you simply just, there is an independent entity that schedules the wind resources in California, you pay for that independent entity to do that for you, and essentially if your hour-ahead schedule meets that hour-ahead forecast of that independent entity, then essentially your deviations. I mean, for most generation units, your deviations are netted over 10-minute intervals, but in the case of a wind resource or a participating intermittent resource in California, those get netted and settled over the entire month.

So, the idea is that, on average, you just have to for the month meet your hour-ahead schedule and you pay your deviations on the difference.

Now, this imposes a cost on other market participants as the share of wind has grown, and other intermittent resources has grown, it has increased, it is roughly about two million in 2005 to four million in 2006.

So, just to summarize in terms of the RPS, is it is the payments above the market-clearing price for the energy, the other is the fact of the difficulty perhaps with reserves and the intermittency. Just to give an example of the intermittency, in California during the July 2006 heat wave, which essentially the system peaked on 50,270 megawatts, roughly three percent of the installed capacity that we have, roughly 26,090 written here, was actually providing electricity.

So, a large amount of wind can go away pretty fast in California, and that is certainly something that has to be dealt with in terms of the inter-ties, as Rob discussed, as well as just holding reserves as well.

So, that is sort of step one of the greenhouse gasses. The other is California has adopted AB32, which essentially proposes to limit greenhouse gas emissions to 1990 levels by 2020, and essentially primarily on

stationary sources, and what it is going to be is a load-based cap, and what it does is it is going to apply primarily is to the electricity consumed in the state from investor-owned, as well as municipal utilities, and the Air Resources Board has the option to design these things as a market-based mechanism, but one that seems to be most popular is the cap in trade mechanism for managing this and setting a cap on a load-based cap.

Just to give you an idea of what California's greenhouse gas emissions are, the good news is that you can see the two brown lines are from electricity, a lot of these others are things that are not covered by AB32, but the task is not that onerous, hopefully.

So, there are some interesting facts to kind of talk about, well, what is the goal for a state-level policy for a global pollutant, and just to renew some of the economics for California, for our purposes, California is extremely import dependent, it obtains more than 20 percent of its energy from imports, but it is also part of the WACC, and essentially the physics of electricity, as Rob alluded to, it is impossible to determine what plant is selling to which customer, so essentially the way you manage that is through this sort of financial fiction of you say if I am selling energy to you at 200 megawatts, what happens is if you inject

200 and I withdraw at least 200, then we are going to deem that I have bought your 200.

So, the issue here is the fact of just bearing that in mind, is the question that there is going to be a significant potential problem of what we call leakage in the sense that because it is a load-based cap, we will discuss that. So, one of the big issues here is just what should be the goal of a state-level policy like California, given this fact that we can have leakage, and it really is this issue of the scaleability of the program, and not to really, if you like, achieve significant greenhouse gas reductions, because that could just simply lead to leakage in the form of the greenhouse gasses produced elsewhere, as well as just firms simply exiting the industries in California.

So, just to go through an example of how leakage might occur, as we said, California is part of the NERC reliability council, WECC, and so what would happen is the simplest way to think of it is that there is sufficient green energy in the WECC that could meet the greenhouse gas emission standards. California's load-based cap could therefore have California buying this green energy.

The problem is that there is not a whole lot of spare capacity in the west. Just to give you an

example, during that July 2006 heat storm, there was essentially 2,000 megawatts of spare capacity available in the entire WECC. So, in other words, in that entire brown area right there. So, essentially the point being that all generation units had to operate.

So, the fact is that California purchasing power from the green resources located outside the state and inside the state to meet its RPS standard, the point is for the rest of the west to meet its demand, it would effectively have to be running the units, the so-called dirty units in California. So, this is just a simple tabulation of saying, okay, we have got total WECC supply, we have got total WECC supply able to meet the greenhouse gas emissions cap, we have got California average demand, you could see that demand is less than the total amount of supply able to meet the cap.

So, essentially with this kind of reshuffling of where people are taking their financial delivery from, California at least can as a go-it-alone strategy can meet this cap without essentially any new green capacity built in the west.

Now, to advertise another paper that goes into this, Jim Bushnell and Catherine Wolfram have a paper that essentially looks at this in far more detail, goes through and also looks at the issue of the recently

enacted five-state policy and essentially concludes that even for the five-state in the west policy, there is sufficient green resources out there to be able to essentially have the total amount of supply just able to meet the demand for clean energy in the WECC.

So, essentially the point being is for the short term, most of the problem is going to be in terms of essentially reshuffling where people are taking financial delivery with very little potential for the greenhouse gas reductions. I should emphasize, that is not necessarily a bad idea, because of the fact that if it turns out that you do go for very, very difficult and costly reductions initially, that could really work against the overall goal, which is really, we want to be able to scale this thing up to a level at which the number of states, the number of countries, is going to be able to really manage the greenhouse gasses and reduce them, rather than just to produce the sorts of leakage in the form that we discussed here, or leakage in the sense of firms packing up shop and leaving the areas where there is these caps and going to the areas where there are not the caps.

So, the other issue is just this question of really what are we trying to achieve here with a cap in trade mechanism, and it is essentially the price

certainty into the distant future for emitting greenhouse gas emissions, because fundamentally the scale of investments necessary are going to require private sector participation.

This is the sort of thing that sort of little small kinds of investments are not going to deal with, and so the idea is really to try to get some sort of stable price signal, and certainly one of the things I think is worth considering is really a floor and a ceiling on the price of permits, a floor being, look, you know, I just did a quick calculation for myself of my greenhouse gasses are about 10 tons per year, and if I can buy essentially a $20 per ton carbon permit to enforce the floor, for about $200, I could feel morally superior to everyone else, that is perhaps, $200 is a pretty low price for moral superiority.

So, and similarly, the state can promise to issue permits if the price goes above some level, this can provide the price certainty for a cap in trade mechanism to be put in place, because one of the big fears with cap in trade mechanisms is what is written here in the European experience, is the fact that prices can be extremely volatile, because of the fact that permits tend to sort of appear, or the interactions with the price of fossil fuels, in other words a very high

price of oil makes everyone want to reduce their greenhouse gas emissions, not because they are environmentalists, but simply because they want to consume less gasoline. So, this downstream impact of these permit markets is another important thing.

So, just to finish up, how do these two things interact? Well, the first is just to point out that really the big issue is to design a market mechanism and the hope is that these state-level policies will coordinate to design a mechanism that can be scaled to the entire U.S. at large, focusing on trying to get tangible reductions really I think can be self defeating in two ways. First is to point out to the nay-sayers that this is very costly. The other is just simply create more greenhouse gas emissions globally by the fact that people are now producing at locations that are not the best sufficient when you ignore greenhouse gasses and therefore producing more greenhouse gasses.

So, for example, refining oil in the middle of Montana and then shipping the oil back to where it is actually consumed as gasoline probably is not the best way to go. There's a good reason refineries are historically on the California coast, you pull the tanker right up and that is it.

And so, essentially to manage the interaction

between RPS and cap in trade is that a higher RPS standard interacts by essentially reducing the price of permits, because if I have got more renewables, I have got less essentially greenhouse gas emissions, so therefore permit prices fall.

So, the way to think of an RPS is really, it is not going to change how much greenhouse gasses are produced if the units are built. In other words, the wind is going to run it if there is wind, because there is zero marginal cost, the solar is going to run it if there is sun.

What you really want to do with the RPS is really displacing the construction of fossil fuel generation, whereas the cap on greenhouse gasses is affected both at changing the merit order of how generation units operate, in other words favoring the wind and the renewables and the hydro and the nuclear and the others that do not have these carbon costs associated with them operating, as well as essentially getting a different mix of generation built.

So, I think that there is sort of, if you like, a method to the madness of RPS and cap in trade, is that really I think that PRS can help to get you those greenhouse gas emission reductions in the early phase when the cap in trade mechanism is largely unable to do

that because of the problem that it does not cover a large enough geographic area, and so the idea is initial stage is work with RPS, then go to essentially focus on scaling the cap in trade to the largest area possible, and then once you have scaled the cap in trade, realistically the right price of carbon is going to do the job for you in terms of getting the investments and operating decisions made.

So, I will stop and open it up to comments to all panelists. So, thank you. Or we can go to lunch. So, any questions?

AUDIENCE MEMBER: Just a quick question. The issue of mandatory programs, RPS, and cap in trade, I am wondering if some of the panelists could comment on the impact that they may have on the voluntary programs that Rob mentioned, the rent markets that we are seeing, the claims that consumers are seeing now for green power. Also the green power pricing programs. Those kinds of claims, the assumption behind them is that it is something extra, you are paying a premium for it, it is not something that is required that the power does not have to be produced anyway under RPS.

With cap in trade, you have the potential, depending on how the property rights are set out, of having it having it said if the renewables are not given

property rights under cap in trade, what kind of impact does that have on the kind of voluntary advertising claims that are allowed for these green powered products? Thanks.

MR. GRAMLICH: Everybody is looking at me. It is a very good question, and I think we are at an early stage nationally in the development of these policies. There is a lot of demand for the voluntary programs, so I don't think they are going to go away, but you do have states that have both, either a voluntary program where a given company may want to buy more renewable energy credits than the mandatory state policy requires, and I think that works pretty well.

You can get into issues that are a little more challenging related to carbon and emissions regulation. For example, I think it is very clear that if you had a carbon tax, that prices carbon value, then you could go out and buy renewable energy credits and you would know that that renewable energy credit is directly increasing renewable energy output and decreasing conventional fuel output.

It is not quite so clear with the cap in trade type of programs, because you could argue that the cap is the cap nationally, and that various individual market participant behavior to buy more or less of

anything does not affect the cap. It does not reduce a given pollutant.

So, I think that is a challenge that people are working on in a number of states that currently have carbon policies, and nationally.

AUDIENCE MEMBER: Thank you. I am Mike Canes with LMI. I have a quick comment, I guess, for each of the other three panelists. In the case of Tom, I would just like to know a little more of what run of the river hydro is, if you could just elaborate a little bit on what that technology is. For Frank, it seems to me that this notion of selling permits at one price and purchasing permits at a different price creates enormous incentives to lobby because there is a great deal of rent associated with where those prices are set, in either direction, and the environmental community, of course, will have great concerns about those prices, too, and it just seems to me that a lot of resources will be spent on lobbying on that issue and I am just curious about your reaction to that.

And for Commissioner Craig, excellent presentation, I really enjoyed what you had to say, but my memory of California is quite different from what you presented, which was that the risk was shifted, but what I recall, if you think of Enron as sort of the whole

mess out in California, is that in the end, the governor intervened and told David Freeman to go buy electricity at any price, anywhere, which he did, and a lot of very high-priced contracts were signed and electricity did flow back into the state, but a lot of rents -- well, in a form there was a bail-out there, and it ended up with all those contracts being reneged upon later and the governor being recalled, at least in part for that reason.

PROFESSOR WOLAK: As a California representative, I have to correct almost everything in your statement. The contracts were never reneged on, first off. Second off, the contracts were not signed, were signed effectively because of the fact that they were signed at high prices, largely because there was no mitigation. I mean, you had to buy out the expected price that the market participants thought they could sell on the spot market. I mean, it is a generator is not going to sell you power that he knows he can sell for $300 for any less than $300.

So, two things that I definitely would want to correct is first is that they maybe were signed to high prices because of the fact that the negotiators were not the best, but the bottom line is, the big issue was the very, very no mitigation in terms of the contracts that

were signed. The other is that they weren't reneged on, and the other is that that is basically what caused the prices to stabilize in the short-term market.

AUDIENCE MEMBER: But they were renegotiated. I think you are incorrect.

PROFESSOR WOLAK: No.

AUDIENCE MEMBER: You may not want to use the word reneged, but they were renegotiated.

PROFESSOR WOLAK: Once again, I think we have a difference of semantics there, because renegotiation means that they gave them a better deal, which I don't think any of the -- I mean, a lot of that was in exchange for giving up the lawsuits, the state essentially was a settlement. They do not renegotiate unless there is something that they get in return. And what they got in return in most instances was essentially the agreement by the state to drop the lawsuits against the generators.

MR. ORVALD: I will just respond to your question about the free flow of the hydro. I actually do not understand the engineering behind it that well, but I do know that it sprang about in the Pacific Northwest, and there are a lot of debates about the free flow of fish in the native rivers, and I believe that the project that I had in mind is happening up in

British Columbia, and they're in the process of undamming or at least not damming certain rivers in the area, and I think it is very experimental at this time, but the idea is to create mechanisms that you do not damn off the whole river, that you still try to extract some energy from it.

MR. GLAZER: I don't want to weigh into the California discussion as much, but going back, again, back into history, and I will do this from an eastern connection perspective. Back at the time of restructuring, we needed peak load generation. That is what we were short of at that time. We had an excess of base load generation as a result of the nuclear investment that had been made, and the question was how we would get the fleet of peak load generation.

I would argue that we actually got a whole lot of peaking capacity built on the cheap, and the evidence of that is the bankruptcies of Mirant, Calpine, NRG and others.

So, in that sense, the risk was shifted to the investor. In fact, there was overinvestment, but that in the old days, there would have been that bail-out.

Now, today, we are in a shortage, a potential shortage of base load, and unfortunately not continuing through on the model, we are now looking at some hybrid

models or half re-regulation, whatever, but to me the evidence that we actually did accomplish something was we got that peaking generation built, which was what we needed at the time, and the bankruptcies is the evidence that there was some risk shifting that went on.

MR. GRAMLICH: If I could just add it was not a clean process by any stretch, but the comment by Jim Bushnell yesterday was that there was something like 200 gigawatts of gas generation built in five years and much of it was unused for a couple of years. There were major financial losses as a result of that unused capacity, and as far as I know, all of that financial loss was borne by the shareholders of those companies.

PROFESSOR WOLAK: Any other questions?

AUDIENCE MEMBER: Yeah, I think that was Doug Arent that said that, but I seconded it. I wanted to ask you, Rob, what your impression is about capacity markets and whether they are go for wind or bad for wind relative to, say, an energy-only market with a really high price cap.

MR. GRAMLICH: That is a very good question, because there are, as obviously you know, a very active debate that is still going on. It has been going on for 10 years in the electric industry, about when you have electricity markets, how do you value peak load

capacity? There are really two ways to do it: You can have a long-term capacity market where you get basically sort of a fixed contract through a central auction market, as PJM has, or whether you allow for higher spot energy prices to reflect that value on peak.

In my personal view, and I think this was the view of FERC at least through the last administration, is that either approach from an economic standpoint can work. There is a pot of money that needs to be there if you want to retract and retain generation in demand side resources, and there is no reason you couldn't put that bucket of money into a spot market or a capacity market and it has been done in those two different ways.

From a wind energy perspective, we are neutral. We are agnostic on it. I mean, I acknowledge that that value needs to be reflected in either spot prices or a capacity market. The way wind plays in either instance is that we believe we should get fair capacity value for our resource, which should not be 100 percent of our name plate capacity, should not be 95 or 90 percent as gas and coal and nuclear generators get reflected in their forced outage rates. I mean, no technology is available all the time dependably. Wind is no exception. Wind is generally much less available than those other resources, and the studies, you have to do

kind of a systems study based on loss of load probability methods, standard methodology in the industry to determine in a given region what the capacity value is of wind, and it turns out to be typically in the range of 10 to 40 percent.

In other words, on a peak, on the typical peak hot summer afternoon, you can expect about 10 to 40 percent, and that does not mean that is the range, that means that some areas are around 10 percent, and we know that, other areas are closer to 40 percent and we know that.

Having the geographic diversity of the wind makes a big difference. You get a lot more dependable capacity if you spread it out because the wind is always blowing somewhere, but at any rate, that is the appropriate methodology to determine capacity value and we can play in either system.

AUDIENCE MEMBER: Peter Rohde with Energy Washington. Craig, you talked about the smart grid and I guess net metering. It seems to me that if plug-in hybrids had rapid market penetration, it would throw off the balance, supply/demand balance, because most people would have no incentives to recharge at night, because we do not have the smart meter, or the net metering.

MR. GLAZER: Right.

AUDIENCE MEMBER: What is kind of the roadmap for getting there in terms of time, in terms of investment? I mean, what does it cost a utility to put in a smart meter or net metering or --

MR. GLAZER: Well, it is interesting, because people talk about this often in the context of the meter, and the meter is clearly an important part, but terminology gets sometimes very squishy. Sometimes smart meter means nothing more than, well, gee, I could drive around the neighborhood with a truck and I can lay off all my meter readers and that is a smart reader. That is not providing the two-way communication into the home.

So, it is a whole lot more than just the meter, frankly, and I think we just have to sort of engage all of the pieces of the debate. Part of it is the appliances, part of it is the wires, the transformers, et cetera. So, it is just a huge challenge, and what we are trying to do, quite frankly, is tee up the debate and the discussion, and frankly define it. Because, as I mentioned, the term is not even well defined, which is why we put out the brochure that we put out, to begin that discussion.

As I said, it is not something where I think we just override state laws or anything like that. We have

got to make this work on a broader scale, but metering is one piece of it, but I think it is much broader than that, and we need to get that discussion.

What we are thinking about, quite frankly, because people always ask me what can Congress do, for example. We have thought about and had discussions with people about ideas of getting some national protocols out there to allow the communication. Again, more than just putting the meter in, getting some communication protocols out there that could be utilized.

What I get back is, well, this is an international market, you have got equipment manufacturers that are doing this internationally. So, frankly, we may need to look at a standard-setting type activity that is on a broader scale and we have got some thoughts about that.

AUDIENCE MEMBER: In terms of timing, I mean, plug-ins could be on the road in three, four, five years.

MR. GLAZER: Right. I mean, we need to make progress on this now, because we cannot, as I mentioned before, we cannot just sort of build our way out of this new transmission. We are looking at, in PJM, part of the recommendation is we would have an annual technology plan. We would set the goal and then we would have an

annual technology plan working with all of our members, what are we doing year by year to meet this goal. What is our five-year milestone, what is our 10-year milestone, and then having a certifiable plan, if you will, to get there, that people can see. Because I think we have to make progress in five years, a different level of progress in 10 years, et cetera.

So, the vehicle will be the technology plan. When is it needed? Today. Okay? But I think the technology plan concept is to sort of think big and try to work through all the different aspects of it.

MR. ORVALD: Yeah, I would just add one thing from the utility's perspective is the need to try to figure out a way to change the incentives, a plug-in hybrid is essentially a distributed generation, which is, I mean, in a static way, is decreasing the amount of load, which is decreasing the amount of revenues to the utility. There is just a lot of change that has to happen with the regulation, at least on a state level for utilities.

PROFESSOR WOLAK: Okay, John?

MR. SEESEL: I actually have one question, probably more for Tom than anybody else. Tom, have the people you have been working with looked into some of the difficulties of sequestering carbon? Because I know

president Shirley Jackson from RPI, who was a panelist yesterday, talked about some of the problems that will be faced with dealing with carbon sequestration, and I just did not know if that is something that you guys have been looking into closely, also, and what your thoughts are on that.

MR. ORVALD: It is a great question. I myself do not have the answers, and we have thought about it in the abstract sense, but we do not represent any clients that are working on it directly. The most I know and the most up-to-date information is I at least browsed this new report from MIT on the future of coal, and I think they have it right when they say that the jury is out on which one of the coal technologies is going to be able to figure out sequestration first and we should let them compete.

PROFESSOR WOLAK: All right, since it is lunch time, I wanted to thank all the panelists for their comments, and I guess lunch is from 12:45 to 1:45, we will start up again. So, thank you very much, everyone, for their questions and for the presentations. Thank you.

(Applause.)

(Whereupon, at 12:35 p.m., a lunch recess was taken.)

AFTERNOON SESSION

(1:50 p.m.)

MR. BUSHNELL: Welcome back to the conference attendees. We are starting an afternoon session themed around savvy consumers in the marketplace, and we have various representatives of consumer views from different perspectives. And I do not know what you would call myself. I do consume electricity.

Today we have with us Ed Tatum who will be speaking first, John Anderson, and Anthony Mansfield. We will each be going, and then I will conclude, we will each be going for about 20 minutes, I believe, and then we will take comments and questions from the audience after everybody presents if that is okay.

So, we will start with Ed Tatum.

MR. TATUM: Thanks, Jim.

Wow, 20 or 25 minutes. Wow. Anyway, I am Ed Tatum with Old Dominion Electric Cooperative. I want to thank the FTC for having us here, we did have an eventful day yesterday, and clearly eventful day today. Now, theoretically yesterday I learned how to work this, but you know what, I might not have.

MR. BUSHNELL: Actually, it is different now.

MR. TATUM: All different, yesterday was 10 minutes, today 20. Page down works for me.

I knew that Frank Wolak would be here, and so as an electrical engineer, Frank has spent a little bit of time trying to help me understand what goes on in his world, and so as I tried to remember all these things, I said, well, let me try to get an idea of where we think we might be or trying to approach the world of industry restructuring, and it seemed from my simple perspective, that we were trying to get into a competitive marketplace.

So, one of the neatest things that I have found that my kids taught me about was this thing called Wickipedia, and so I got out to Wickipedia and I said, well, what is a competitive model, and this is what it came back with. Again, it is an economic model describing a hypothetical market form. Hypothetical market form, in which no producer or consumer has the market power to influence prices, it has the five parameters that you see before you.

So, I guess theoretically, and, Frank, I put these drawings in here, because they were on the website as well. You can help me with them later, but it is something that has to do with marginal costs I'm thinking.

MR. BUSHNELL: Did Frank write the Wickipedia entry?

MR. TATUM: Actually, that is somewhat anonymous, but we can check into that later. But in general, through competition, we have lots of suppliers, faced with lots of buyers, and a very elastic response to changes in price and supply. So, things are supposed to respond fairly quickly, and in a way that we would be able to predict.

The reality is, again, and we had an economist at Old Dominion who taught me that perfect competition is a state that economists attempt to approach, but I do not know if we have actually ever really full achieved it.

The other point I want to bring, and I think this really is a very critical aspect as we think about what to do in these upcoming marketplaces and what we think about as far as how we make wholesale markets work in the topics of yesterday. We did not start off this way. We started off with Samuel Insull model, Edison's protege, 1898, trying to come up with a monopoly. It is a regulated monopoly, and that is how they set up the industry.

It worked out very well for folks in that business, but we built our generation, we built our transmission, and had basically an industry model that is 100 years of inertia and monopoly basis behind it.

The thing that I do not know if this is an urban myth or not, but I like to believe it is true, the little guy on the monopoly board really is a caricature of Samuel Insull. Maybe we can verify that. Yeah, that is true.

Anyway, thank you.

MR. BUSHNELL: It was a good shot.

MR. TATUM: The state of the energy marketplace today. We are in markets such as where Old Dominion is and PJM, we are seeing generation behaving in a competitive forum. Delivery, from our perspective, is still regulated, both from a transmission as well as a local distribution standpoint.

Then we attempted, and I think the folks talked a little bit about this yesterday, to competitively enable retail competition, and so, you folks when we first got going, were actually seeing some benefits of some choice from 888, back in the olden days, and so some of the commercial industrial folks were able to realize some of the competitive markets. The residential folks just haven't seen it yet, and that is our experience with it.

State of the energy marketplace, from our perspective, Old Dominion's perspective, we think it is just too soon to really determine that wholesale markets

have, indeed, been a success.

Now, that does not mean that we do not believe in it. Yesterday, again, there was some discussion about some faith-based movements, and from my perspective, we are not putting the genie back in the bottle, it would not fit, and it is not going to happen. Companies have divested that spun off their generation, and to try to go back to the old model is not possible.

So, I think we need to make due and make the best with what we have got now. I think that our opportunities to make it work and to be successful. However, I do rage against reports that declare victory, or people who use the headlines or the titles of reports to declare victory. I do not think that is a good approach for us as a public policy standpoint, and especially in these days when we have such a tremendous amount of uncertainty with regards to the success of the markets.

We cannot be moving forward with sound bites of results, we need to really dive into the details and understand what it is we actually have. From our perspective, the wholesale markets are constantly evolving. In PJM, I am not certain, but I think we have had over at least 500 market design changes since we got going, and I'm sure that number is a little bit low.

Retail markets haven't worked out too well from our perspective. In Virginia, we just determined that we weren't going to do that anymore, except for a few commercial industrial customers. My opinion is that that is indicative of, again, of an immature wholesale market, and trying to be able to actually pass true price signals through to consumers, and then again we get into the discussion of the societal good for that and how is that going to work.

The other aspect, and Old Dominion has taken this position for a number of years, that the delivery system is simply insufficient to face many buyers with sellers, and in my opinion, that is the crux of the issue. We talked about developing an industry based upon a regulated vertically integrated monopoly model, and in that situation, we did not build transmission infrastructure to support competitive markets, we built it to face the generation of the incumbent with the load of the incumbent, and these were based upon engineering, and the laws of physics.

So, facilities were designed to maintain reliability, keep the lights on, and that model, we need to change our thinking on the transmission construction, as we have changed our model within our paradigm.

Transmission investment has lagged over the past

30 years, and there are a number of folks that say, well, part of that is the energy crisis, part of it was the overbuilt, part of it was the uncertainty of what was going to be going on in the world, in regulatory, as well as exogenous.

We have had a debate, I think for a number of years, should transmission be a commodity, or should it be an asset? Yesterday we talked about Old Dominion's position again on that, and we do think that transmission is a regulated asset that is a facilitator, if you will, of competition, enabling generation and demand response to compete.

We had a conceptual shift, and we got it, with order 890. We are talking about long-term regional local planning, another huge aspect from my perspective is the open, inclusive and collaborative aspects of that order. Again, the devil is going to be in the details as we implement it between now and the end or the middle of October.

The concept that transmission will be built not only for reliability, but for economics as well. The need to try to somehow forecast generation retirements. That has been very frustrating to the engineers. In PJM, a generator can decide, if they wish to, retire within 90 days notice, and that is hard to plan the

system around that. Of course they are competitive, and there is very few things one can do to compel them to stay.

Cost allocation is going to have to be addressed, as well as regional rate design, but I think that we have got good momentum in both of those areas.

Again, what can be done to improve its performance, develop adequate regional local transmission. Another thing we talk about is allowing the markets to evolve and shake out. We have just finished, every other summer I seem to spend in Washington, D.C., not that I do not like being here, but we are spending time at the Federal Energy Regulatory Commission arguing about something, and this past summer we were arguing about a reliability pricing model, which is PJM's attempt to make sure that there is adequate generation, new generation, coming into the marketplace, because they are very concerned with all the low growth and apparent drop-off of new generation coming in that reliability would sincerely be compromised.

Our organization and others looked at that as an administrative fix, and I am sure that our economists here can talk about the difference in what a capacity market does and how it affects the theory of work week competitive markets. We seem to be stuck with that,

though.

My concept here, though, is to simply say, if we are going into a market environment, then let us go ahead and go into a market environment and understand that it is going to take some evolution. Let us make sure that the folks who own generation do not get hurt too badly, but also, too, do not forget about us. We are low at the end of the line and we have experienced some significant big bang implementations, especially in the Delmarva peninsula.

One other thing I want to focus on, and I cannot say this is just hugely important is to assure that the market monitor is truly, truly independent of the market operator. One aspect that is very important to the load community from our perspective is the ability to have confidence that the markets that have been put into place, and the market designs that have been brought to us, and the actual day-to-day operation are competitive, and are working, and that we have got somebody who is watching out for those types of things.

There has been a plethora of studies that are debating the success of wholesale markets, and without this type of confidence, I think it is hard to continue on.

My organization, they are trying to talk about

about, and I appreciate the opportunity to be a savvy consumer, we are trying to stay alive, but we are a not-for-profit electric cooperative. In 1948 we got started, really got operational in '76. We got some folks actually to work there, and bought in in '83 a little purchase of some nuclear that Dominion Virginia Power had. We have 12 co-ops, 10 in Virginia, one in Maryland and one in Delaware, and since May 2005, when PJM integrated Dominion and AEP into there, our whole load is within PJM.

We have about over 500,000 meters, and that is translating into about one and a half million folks, about 11 million megawatt hours of sales last year, revenues of $817, assets of $1.6. You can read this for yourself. We are FERC regulated. We are not a borrower from the rural utility service. So, we are from FERC's perspective a public utility.

We have this amount of generation here, it gives you an idea of our capabilities, but we are close to about 2,000 megawatts of our own generation.

This is our service territory. This is the pretty map I was talking about, in that you will see, I am not sure your right or whatever, but the Delmarva Peninsula where you see the big 13 up there, it is not that that is an unlucky number, that is simply the road

number of the area, but in 1997 and then subsequently in '98 when L&P first got going, that was a very unlucky area for Old Dominion Electric Cooperative, and we learned a great deal about what it means to operate in a location of marginal price environment. It was a huge awakening, it was a very expensive awakening, and we rapidly took steps to try to ameliorate that.

I told you we are a not-for-profit electric cooperative. What that means is we do not have shareholders. We have consumers, member consumers, they own us, and so from the standpoint of a business model, we really serve one group of folks, our shareholders and member consumers are one and the same. So, subsequently, as a not-for-profit, owned by those we serve entity, we have seen prices, and we react as consumers should react, regardless of whether we are in a regulated or competitive environment.

I had one of our smart guys take a look at the proposed presentation, and I said, well, what should we say about this? He says, well, Ed, people have been responding to prices since the dawn of time. Really, that is pretty much where Old Dominion has been, but it is because of our shape and our structure. We are set up to serve our customers.

As an example of that, people talk about demand

response. We have been doing pretty well with our water heaters and voltage reduction and little AC control for about 10 years, about 10 percent of our load. We did not have a market before that to do that. What we did have to do, we had to learn this new reality and we got into the organized markets.

So, what did we do? We became an active participant in market design at PJM, that is one of the first things they moved from what I was doing previously and said you have to go to all the meetings. So, I go to know all the people at the Windham Hotel, I got to know the drivers, the valets, it was quite an emersion, I spent a lot of time there.

My job was to ensure that we understood what the market design was. Once we understood what the new issue or market design was, we had to be able to explain it to the folks back home, bring it back to the smart guys. Then we had to make a decision as to is this a good thing or a bad thing, and then go back to PJM if it is a good thing, and support it if it is a bad thing, try to oppose it and then work with the coalitions and try to take care of the issues.

If we couldn't change a rule, we had to be knowledgeable about it and we had to be able to respond to it. So we put a big investment of manpower in

covering PJM.

I have been blessed, they finally released me from a totality and a total PJM emersion experience. I have been able to hire my own smart guy who is now going through that same environment, but I still find myself up in those meetings a great deal. So, we have had a tremendous manpower response to that.

Another response that we have had is we have become quite an active participant at the Federal Energy Regulatory Commission proceedings. We have been known to offer opinions on a whole spectrum of issues, in a variety of forums, whatever my attorney will allow me to say without getting in trouble.

We have also restaffed ourselves with what I call smart guys. We have got these folks who have been with the marketers and the traders, they understand trading and risk management. I have got to sit down and really clear my head after I talk to one of these guys, because it is a completely -- I am an old utility guy, and so this is a completely different world for them, and a different approach they have to markets and portfolio management, but it is essential that you have those skills internally.

We also work in a cooperative fashion outside of Old Dominion with an organization called ACES, and they

do a lot of the power marketing for a lot of the generation and transmission co-ops, such as our organization, throughout the nation, but we still internally at Old Dominion, as a consumer, need to have that in-house expertise so that we have a clue as to what is going on in the marketplace.

We have developed a risk management policy, we have a risk management committee, that includes senior management, and we effectuate trades within that approach. We have adopted a portfolio approach for purchasing. We have purchasing anywhere from the next day to typically up to at most three years or so. Remember I did say that we have a good amount of owned generation.

We support continued development of wholesale markets. As I said, I think we are there, the genie is not going back, but we were not looking for objective assessments of the current markets. I think a lot of the work has been done, we talked about yesterday, the recent report from DOE, DOJ and FERC from the Energy Policy Act, I think that provides a very nice summary of some of the studies that have been done, trying to get an idea of how to assess market success, but also, too, some of the variables that should be included in assessing market success.

When you think about people, if we are going to continue on, and we should, with a competitive marketplace, let's do it a little bit more incrementally. Let's not do any more big bangs. If we want to have organized markets outside of the areas that are currently organized, I would suggest a more gradual approach.

Regional local transmission development, I am thinking about changing my name to Ed Transmission, I cannot speak enough of that, but that is, to me, the crux of getting this done.

Again, independent and meaningful market oversight. If we do not think that there is a cop with a baton, a gun, or maybe only a whistle, there has got to be somebody out there on the beat who understands the market. One other aspect of understanding the market is we talk about the details behind operating markets. The PJM tariff might be over at least well over a thousand pages. The business rules and the manuals are about this high. It is amazingly complex. For a market monitor to be effective, he has to have a full and complete understanding of that as well as access to the data that will allow him to assess the viability of the markets.

Finally, is that what you are telling me? Good.

Finally, sometimes the simple solution is not the best solution. I did not turn this in, but a friend of mine did.

Jim, do you want me to take questions or do you want to continue on into the panel?

MR. BUSHNELL: Why don't we take one or two questions if there are any, and I thought we could have a panel discussion at the end.

MR. TATUM: Fine. Are there any questions for me?

(No response.)

MR. BUSHNELL: Let us charge ahead. I have questions for you, though.

MR. TATUM: I bet you do.

MR. BUSHNELL: And I would encourage you to change your name to Ed Transmission, I for one would really enjoy that.

Our next speaker is John Anderson, the president of the Electricity Consumers Resource Council.

MR. ANDERSON: I thank FTC again for inviting me back today as well as yesterday. My presentation today will overlap a small amount at the beginning on what I said yesterday, just sort of as a review, and then we will move into some new material, trying to focus on the subject of today.

So, let me once again assert that we think, at least, that truly competitive markets would be the best way to meet consumers' needs. They would do all the things that we have said that competitive markets do. We point out that we remember very well the problems with traditional regulation, that I am sure that if we were to try to go back or did go back to regulation that we would have those problems again, so this is not a matter of forgetting that.

But I do want to emphasize that there are such substantial problems today with the organized markets, FERC jurisdictional organized markets, that it is causing us to look at every option that there happens to be, and again, my bottom line is that I challenge the FTC to start getting involved in some of these markets. I think it would be extremely useful from a consumer standpoint.

The panel was to look at what savvy consumers were, and that made me wonder, as I did not go to the online encyclopedia like Ed did, I just Googled it and I come up with all kinds of things, it is amazing what you get when you Google something, put in savvy consumers in Google and see, but it came up with a whole bunch of stuff that you would expect a savvy consumer to do. They would be researching prices and options and things

along that line, getting feedback, first-hand experience keeps popping up. Knowing what you want when you start going out and looking is something that is important as far as terms and conditions and things along this line goes.

Ask plenty of questions and hopefully you get plenty of answers. At about this point, I threw it all away and said this really does not make any sense. These kinds of things did not make any sense under traditional regulation, and they certainly do not make any sense under today's restructured markets. They just do not. It just does not work.

Consumers have certainly done a lot of innovative things on their own, and it's done probably because some of the price signals that have been thrown at them. There's been an awful lot of energy conservation, energy efficiency activities that have been done at least by the large industrials that I represent. But no matter how hard you try today, there are just not many viable purchasing options out there.

What you find in the organized markets today is something that is not at all a consumer focus, the generators just simply do not care about what consumers want. You can go tell them that this is the kinds of terms and conditions you would like to have and their

eyes would roll and they would go and they would say here is what we would be able to offer you.

We think, at least, the only way you are ever going to let savvy consumers be able to do what they need to do is to have some sort of a market structure that has a consumer focus, and we just do not have that consumer focus today. I will try to explain a couple of those things.

Certainly under traditional regulation, regulators were the customers, not the consumers, and the consumers had very few options and we all knew that. There was very little incentive for the utilities to be efficient, other than to do what the regulators told them to do. This worked, though, reasonably well, because prices fell for a long time, but then we all know that several things happened, nuclear costs went up, interest rates spiked, inflation grew, environmental costs grew, and all of the sudden there was a consumer rebellion because of prices going up. I am reminding us of that, because in a way we are facing that in the organized markets today. We are having another consumer rebellion because prices are going up yet again.

So, with the rebellion of traditional regulation which resulted in the restructuring is sort of repeating itself today. Many of us thought that a healthy dose of

competition would result in a consumer focus, it would result in consumers being able to have some benefits. We haven't seen these things. Yesterday in my presentation, and I am not going to duplicate them today, we pointed out seven different items that are absolutely essential preconditions for a competitive market. We say none of these preconditions are actually in effect in the organized markets today. You have to have all of them, at least. As an economist, I would say that at least these seven preconditions, they are necessary, if not necessarily sufficient conditions for perfect competition, but at least it would get us a long way down the road.

I would refer back to my presentation yesterday for much more details on each one of them.

As I said yesterday, we are not optimistic that we are going to get any real improvements in these markets. There are entities that are making so much money in the organized markets that are out there that their resources are nearly unlimited in trying to fight the kinds of things that we think need to be done. It is just an overwhelming resource, human as well as financial resources against us.

FERC has said that it understands that there are real problems. I compliment FERC for that. I do not

see anybody from FERC here today, maybe there are and I do not recognize -- oh, okay. But I compliment FERC for that. But what I really want to say is that FERC's actions are great, FERC's talk is great, but the actions are what are really going to count, and what we are going to be looking for is what kinds of things are actually being done to move us in that way.

I would like to be optimistic, but right now I am not that optimistic.

I want to emphasize, also, that these are not self-correcting problems. The stakeholder process within the organized markets is broken. It is stacked in the favor of the generators. The consuming side, whether you make it end use consumers or whether you take Ed's people and the public power and the co-ops and end use consumers together, and they just simply do not have enough clout within the stakeholder process to be able to get what they need, or at least to stop what they do not want.

So, it is just not going to be a situation that is self correcting, it is going to take somebody to take some real action, FERC or maybe the FTC, some help from the FTC.

What I want to, though, emphasize today, though, is this opposition that is coming, and I want to say

that this is something that has us scared, because we do not think that the opposition is being appreciated enough by folks that need to take the actions to fix things. I really want to say that the opposition is not just with my members, not just with the large, members, I'm going to talk about the small consumers, also.

Certainly there are some people that are very happy with the markets, there always are. This is a big country, we have a lot of people. But both at the large and small customers are not doing well.

We put some data into a filing at FERC, it is on our website, that is LCON.org, it is called Supplemental Comments to FERC's February 27th conference, and it gave several pages of rather detailed information that was collected by a nationally recognized research firm, TQS out of Atlanta, and there are some findings in there that I think are extremely important. This cuts across. They looked at nearly a thousand large customers in all the markets, both restructured and in traditional markets.

The data that they presented, the data that is in our filing, vividly show that the failure to achieve the expectations significantly changed the way that large consumers are viewing restructuring today. The change. For the past nine years, the customer service

scores in regulated states are considerably higher than those in restructured states for every factor that was measured by TQS.

All factors have improved in the regulated states, but there has been very, very little improvement in the restructured states. Almost none. I mean, it went from 55 to 57 percent in the overall.

Then the results for the improvements in the price satisfaction category, and much more detail is in our filing, if you get it, shows that it is almost exactly the same for both restructured and unrestructured, which says it is not just price that is causing the opposition from the large customers, it is much more than price. It is all these other things that went along with it.

What we found particularly disconcerting are the very poor scores in there in the restructured states for assistance in adopting new electro technologies and other energy efficiency matters. This is something that really surprised us. We thought that not only would real competition in electricity bring about competitive prices, but it would also bring about technological innovation. It would make us move from a time, like in the telephone industry, when you could have any phone you wanted, as long as it was black, it had a rotary

dial and it sat on a horizontal surface, to what we have today in telecom of a wide array of technical products. Just all over. Just staggering. We just haven't seen that.

We are still using meters on residential houses in the United States of a technology that was in the 1930s, if not in the 1920s. It is just we have not seen the technological innovation.

There was another survey by J. D. Power, a very well-known survey, and from the press that I read about this, it talked about the business customer satisfaction with the utilities has improved for the third consecutive year. I said, well, that is great, isn't that wonderful. However, the average utility scores in the west and the south were higher than in the east and the midwest. Where has the restructuring gone on? In the east and the midwest, not in the south and the west.

The senior director for J. D. Power said, we always see this profile of the difference between the west and the south versus the east and the midwest, and he said there are some strong company image scores in the east and midwest, referring to PPL and Mid-America, but those aren't the ones that had done all the restructuring, but there are fewer than in other regions.

The opposition is not limited to just large industrial stuff, and I am not going to go into great detail on this sort of stuff, but I urge you to look at it very carefully. I mean, it cuts across a whole lot of lines, and if you haven't followed this opposition, I urge you to do so.

Cato, which is usually a very market oriented organization, came out with the rethinking electric restructuring, I guess it was close to a couple of years ago now. APPA, we talked about that a lot yesterday here, has done a series of I forget, 12, 13, 14 studies, and if you have not looked at them, I urge you to do so. They are very, very well done studies.

Progress & Freedom, you would never call them a liberal organization, basically put out and said electricity restructuring, what went wrong, and basically said if we can't fix it, we ought to scrap it. Nobel laureate and columnist Vernon Smith wrote a Wall Street Journal article that was an op-ed piece.

Carnegie Mellon Professors Lave and Apt along with one of their graduate students authored Lessons from Failure of the U.S. Electric Restructuring. The Alliance of State Leaders Protecting Electric Customers, I do not know the correct name, presented comments to the task force that are quite interesting.

New York Times ran a whole series of articles. This is not low-level kinds of opposition. This is pretty high opposition.

It has not just been like I said with the large. The small customers have also jumped in very, very strongly, primarily in the areas of FERC jurisdictional alliances and RTOs. I mentioned yesterday Maryland and I am not going to spend a whole lot more time on Maryland again today, other than to say they are the poster child for the opposition.

Maryland faced up to a 72 percent rate increase and it just brought the wrath of consumers all over the place. We can all argue, well, there was a long price freeze and then gas prices went up and all of that, the bottom line was rates went up 72 percent, and the second governor was lost to electricity issues as far as I am concerned. The first was Ray Davis in California, after the rebellion there, and the second was in Maryland.

The legislature took all kinds of actions, tried to fire the commission, and this sort of thing. They did block the constellation, the proposed constellation, SB&L merger. They got a new governor, now we have a new chairman of the commission and several new commissioners.

It is not just Maryland, and let me take a

little bit of time in some other states where there is some opposition. In Connecticut, CL&P rates increased by over 70 percent. The Attorney General proposed legislation to allow the state power authority to build new generation, which is clearly a movement back toward regulation. The governor pushed for disclosure of supply bids and a whole variety of other things. The AGs of Connecticut and Massachusetts together have filed now several complaints on the ISO New England's capacity, forward capacity market, LICAP I think it's called. That is far from over. There is just a tremendous rebellion there.

In Illinois, if you haven't followed it, there was a 30 gigawatt reverse power option for last fall, for sales beginning in 2007. Prices went up very substantially. The Attorney General there asked the Illinois Supreme Court to quote the options, but the contracts had already been signed and they couldn't do that. Legislature is now close to passing an extended rate freeze for another year.

The Illinois utilities, that's Excelon and Ameren said it would lead to bankruptcy. John Rowe, the CEO of Excelon said he would fight the rate freeze like a trapped rat. This is the kind of emotion that is going on.

The Illinois lieutenant governor asked the ICC to investigate overpaid executives. The AG has filed a complaint with FERC alleging that suppliers had price manipulation and things along this line. These are not pretty pictures. These are, you know, governors right on down within the states.

In Maine, there is a wide range of business groups and press lawyers just oppressed for the entities and for the state of Maine just to pull out of NEPOOL or the ISO New England. The Maine Public Service Commission conducted a study of doing that, and by the way, the trade press today reports that a special investigative body has now recommended that they do pull out of NEPOOL. So, that is updated as of today.

The staff has recommended turning Maine into an electrical island, or tying it in with New Brunswick and signing a memoranda of understanding laying out how to cooperate with Canada rather than any more within ISO New England.

New Jersey: 43 of the 80 members of the state assembly signed a resolution asking the Board of Utilities to reject a merger of Excelon and PSEG. The merger was withdrawn and I think that is over now. There were a lot of other things, but this event has opened up the Public Service Commission in New Jersey to

understand really the operations of PJM in an L&P environment.

Ameristeel, which is one of the Alcon member companies, closed down a major melting facility in New Jersey, and the New Jersey Commission and governors and the Economic Development Office have become extremely active and they are getting even more active.

There are other states, too, I am not going to go on with many of them. Michigan is considering simply returning to regulation. Pennsylvania was initially one of the strongest supporters of PJM and of the restructuring that took place in that area, but residential prices have risen very substantially. Two other companies, Alcoa and Occidental Chemical have shut down major facilities in the PJM area, due to power cost increases, and this has started to catch the attention of economic development people. It has also started to catch the attention of the Office of Consumer Advocates. They have been organized and as recently as just last week they have done joint filings at FERC asking for substantial increases in market monitoring and things along this line. I think I mentioned Connecticut before, so that is a duplication there.

As I said, we were concerned, such opposition, in our view, is not going to turn out to be ways of fine

tuning those markets into truly competitive ones. The opposition generally results, in our view, in steps away from competition rather than steps toward competition.

However, as I have to say here, given today's choices, if what you have is today's organized markets, this is probably the best way to go, but that is not the way we are recommending. We are still saying we want to see competition and we would like to see some real actions very soon. We still believe that the real or true competition will offer the savvy customers real options, it will allow customers to be able to do the kinds of things that we think are very important for them to do.

We are not optimistic, however, that we are going to see these substantial changes to get there. It is a very, very major job. It has taken a long time to get here and we just do not have a long time to get it. But unfortunately, in our view, the rebellion is just growing, and growing so rapidly, that if there are not very substantial changes made very, very quickly, we just do not know what the results are going to be.

So, we believe, as we have said over and over, that real or true competition would be the best way of meeting consumers' needs; however, we point out again that today's markets, and we have been saying this for

years, today's markets are far from competitive, and in a way they are getting worse. Adding things like the capacity markets and very poorly structured ancillary services market and things like that are simply making things worse rather than better.

We believe that today's market structure is not competitive, and on top of that we do not believe it is sustainable. The opposition is in such a way that we simply cannot -- it cannot continue.

We think that it will be very difficult to fix it. Actions taken like those in Maryland and Illinois, which I mentioned, and I realize I did not mention Virginia, but I think Ed just did, to a very substantial movement back to competition for the Commonwealth of Virginia and other states will continue until these markets are fixed. Like I said, we do not think that we have a lot of time left.

The real problem to us is that neither the traditional regulation nor today's organized markets have an end use customer focus. Neither are expected to meet consumers' needs and neither do meet consumers' needs.

The real challenge, though, is going to be to find a way to truly respond to the needs of consumers. It is difficult, I am not optimistic, FERC does not have

a track record of responding to consumers' needs, that is just simply the way we have looked at it and looked at it for a long time, and so I leave the FTC with the challenge of saying, please come help us.

Thank you very much for the opportunity to be there and I will look forward to questions later.

MR. BUSHNELL: Thank you, John. Our next panelist is Anthony Mansfield from Heller Ehrman, LLP.

MR. MANSFIELD: Good afternoon, and thank you to John and the folks here at the FTC for inviting me to participate today. I am an attorney at Heller Ehrman here in Washington, D.C. I think I am here, though, not because of my association with Heller, but rather because I spent approximately the last four years working with the CFTC here in Washington as a trial attorney, and I was focused for almost my entire time concentrating on allegations of manipulation in the energy markets.

I will mention that I was not here yesterday, but when I did arrive today, I was picking up of the packets that are out there on the hall table and I was happy to find one that was entitled Manipulation and Mirages: How Eroding Legal Protections Lax Regulatory Oversight Harm Consumers. I then flipped through it and I saw my name prominently featured as part of the

revolving door out of the CFTC into private practice. So, it was a nice way for me to start the afternoon.

MR. TATUM: There is something for everybody.

MR. MANSFIELD: There is something there for everybody in there I am told. I did want today, having spoken with the folks on the panel and with Tim, to try and talk a little bit about some of the things that in my recent experience the government, in this case the CFTC, has been doing in the energy markets to try and deal with issues about potential manipulation, and to try and obviously protect the integrity of those markets.

Given the fact that the focus of the panel today is on electricity, I thought that it would be appropriate for me to talk about natural gas, which is obviously one of the fuel sources for the electricity markets.

I think that in my time at the agency, there was a number of things that were going on that I heard Ed referring to and I took or I was encouraged by that, and that was this idea of, one, who is going to be the cop on the beat in any of these energy markets, and whoever that was going to be, it needed to be someone who both understood the market and understood the data that was flowing through those markets.

And at least it was my experience that the CFTC, and our sister agency at the time, the FERC, was making tremendous strides to understand in this case the natural gas markets from the CFTC's perspective, and to be making a meaningful difference in terms of trying to protect the integrity of the prices in those markets, but this concept of manipulation and the impact that it can have on a savvy consumer was what I was ultimately trying to sort of put some thoughts together, and I think that from the CFTC's perspective, the markets that it spends a lot of time looking at and policing are markets that serve a number of different functions, and probably the most relevant one from a savvy consumer standpoint is the price discovery function. That is these markets and the prices that trade in these markets are obviously expected to and do provide signals about the larger supply and demand issues that are going on in the market, and therefore certainly any effort or any attempt to manipulate those prices has ramifications not just to the prices themselves, but to the integrity of that market as a source of information about prices and a source to consumers who may be trying to make decisions about whether to be using, in this case natural gas, or for example to be using some alternative fuel in terms of the production of electricity.

In terms of what the agency, the CFTC, has been doing, there was obviously traditionally an expectation that the CFTC's focus was principally on futures markets, where obviously traditionally also a lot of the price discovery went on.

I think, though, through a process of litigation, unfortunately the CFTC was also challenged on a number of occasions as to whether it had authority that extended beyond the futures markets, and in a series of cases, there have been decisions that acknowledged that, putting aside, as a matter of policy where the CFTC seems to be going, it certainly has authority to be in the physical markets as well.

I think that certainly it was my expectation as someone who was working at the CFTC that the price discovery function was not limited to the futures markets, but that certainly there were in terms of what I was hearing from the people that participated in those markets, a price discovery going on in physical markets as well.

So, some of the things that the agency was doing in the last four years, that I had a chance to be a part of, were focused heavily in the natural gas markets and they were all focused on conduct that was described as attempts to manipulate natural gas price indices, and

here, there was a whole industry of outside entities that were taking the prices that were trading in the physical natural gas markets, and compiling those into index prices which were then in turn being used as the pricing mechanisms for such contracts, and certainly it was my experience that a lot of the utilities were using those index prices to price contracts because there was an expectation, or at least a hope, that those indices were an accurate reflection of where prices were trading at generally.

I think the number of public settlements that are now out from the CFTC's what began as an industry-wide investigation, that there was a tremendous amount of activity within the natural gas markets where participants were submitting information to these publications, and what they were trying to do is they were trying to ultimately drive where the index price was setting.

And again, in the public sentiments that came out, this was being accomplished in any number of different ways, altering trades, making up trades, inflating volumes, everything to try and ultimately direct or capture a certain index price, recognizing that that index price was then also being used as a trigger on financial contracts that that same

participant may put on to try to benefit from their behavior.

So, this was an investigation that I think that certainly by the time that I was leaving the agency, I think that there are public settlements against companies as well as individual traders that number in the dozens. There are, I think at this point civil monetary penalties that have been assessed that are in excess or close to $300 million.

So, this was a prime example from my experience of an entity within the government trying to go in and to react to and look at and ultimately to assess penalties for conduct that was an attempt to manipulate prices, and as a result, you potentially had circumstances where prices that were being used as triggers for consumers were no longer accurately reflecting the behavior that was going on in the marketplace.

I think another good example that came out of the CFTC during the last four years was a number of investigations that were also looking at not necessarily the reporting of information, but were looking at traders who were trading in the natural gas markets, in particular ways that, again, were designed to try and drive or influence the direction of a price. So, it was

not the reporting necessarily of false information, but rather it was trading with an intention to try and exact or drive a price in a certain direction.

Again, I think in my experience, the CFTC had become very sensitive to, and I hope will continue to be very sensitive to the fact that the integrity of these markets is both in terms of having accurate prices, but also in terms of ensuring that these marketplaces are a source of accurate information, recognizing that it is really the information flow that is certainly as important and critical to consumers, both in terms of being able to make decisions about whether to purchase in this case natural gas, but also to be able to look at natural gas as an alternate fuel source to other things that might be out there.

The other point that I would certainly raise, and maybe I am reacting to the fact that I am so recent to government, is that I know there is not someone on my panel from the FERC who is here to speak on behalf of the FERC, but I would say that it was certainly my experience as well that this was a process that the FERC was working on very hard as well.

With EPAC 2005, certainly it is my expectation that you will see the FERC continuing to play a very active role and a very important role I think towards

the same end which is try and protect the integrity of the prices as one example in natural gas, but also in other markets.

I guess that leads me to my final thoughts, which is just in terms of whether an enforcement scheme is ultimately ineffective or the most effective way for the government to be trying to, and I think the title of our panel was protect consumers and to ensure that they are provided information, and I certainly appreciate that one of the inherent problems with enforcement is that it is after the fact. It is dealing with conduct once conduct has already occurred, and in the case of a civil scheme where you are really talking about potential civil penalties, it raises question about whether the deterrent effect is potentially as meaningful or as lasting as compared to, for example, a criminal type of circumstance.

I think that it is my expectation and hope that as a result of the last three, four, five years of the enforcement that has been going on in the energy markets, that you are going to have both a more sensitive regulator, but also a very current and a very educated regulator who hopefully has a fairly thorough understanding about how these markets work, and that is obviously an evolving process, but as compared to where

these markets were in terms of having effective cop on the beat four years ago, my hope would be that now we have certainly a cop who is in a better position to understand the markets, to understand who is in the markets, and to understand the data in those markets.

Having read again this piece about the eroding and lax regulatory oversight, I would also just point out a couple of things which I think are useful to keep in mind, which is there is obviously oversight that goes on through these regulatory agencies. In my agency, it was the division of market oversight and I was not a part of that, but I would note that there is certainly, I think, an ongoing effort to secure data in order to be able to understand the markets as they are functioning realtime, and the most long-standing example of that that I was aware of was obviously the large trader reporting system that occurs through the CFTC, but there are other examples that are more recent.

I would refer for one example to a recent speech that was given by one of the existing commissioners of the CFTC, who Darren Houson several months ago made a note of the fact that now the CFTC is on a continuous and ongoing basis receiving information from some of the electronic exchanges that are in the OTC market. So, again, there is an effort to be on top of the data, and

I expect to see more of that.

Another example which is from the perspective of an SRO, a self regulated organization as opposed to an agency, is that there was also a recent announcement by the NYMEX which dealt with natural gas as well, and there the NYMEX indicated through its members that it was going to put in place certain requirements to allow participants in the NYMEX to be able to take positions of a certain size to expiration, and it was going to require them in certain instances to disclose their entire trading position, which was both the position on the exchange as well as the positions off exchange.

So, again, from my perspective, I certainly had been reading about and seeing examples where I think there is an ongoing and healthy discussion about what types of data needs to be captured from a prospective standpoint, and obviously that is part of a larger discussion about who potentially is the best entity to be doing that type of oversight. But I certainly see examples of both the marketplaces in which natural gas trades, and from the agencies who have roles in terms of overseeing those markets, to figure out and to be sensitive to what information they need to be on top of, where those sources of information are, and hopefully putting in place a means of getting that information so

that they can be anticipating what they are seeing in the marketplace. So, with that, I will conclude.

MR. BUSHNELL: Thank you, Tony. I would like to Q up a question that maybe you can think about answering when we get to the panel, having to do with the definitions of market manipulation and how that is contrasted with market power. One of the things I have run into, in a previous life I was an independent market monitor at the Power Exchange in California, and it is interesting that there are these two different cultural approaches where the CFTC thinks about issues that they call manipulation, and economists in the antitrust world often cringe at the use of the word manipulation and think about things much more in terms of market power, which is basically focused on producers, and maybe buyers of the commodity, where manipulation enforcement is often focused on traders, market makers and those sorts of things.

I get the impression that there are not many industries where both are a big concern. Electricity is one of them, though. And, so, it is a very interesting subject about where those two concepts overlap, and how the different philosophies of enforcement, which are very different, between antitrust and what the CFTC does, how those interact with each other. So, I would

like to get back to that when we get to the panel.

MR. MANSFIELD: I am glad to have a chance to think about that one first.

MR. BUSHNELL: Yes, sorry to sandbag you with that, but that is one of the topics that we have been kicking around for a long, long time, and I don't know the answers to any of that.

I have actually been very pleased with this panel, there is a lot of interesting stuff here, and I want to take advantage of my role as moderator to hog the question and answer period a little bit at least. So, I will -- I am going to talk through a topic that I thought was a variation on the theme of savvy consumers, but actually is more closely linked to what we have heard so far than I thought it was going to be.

I have been thinking a lot about the issue of wholesale buyers not from the individual end user perspective, but from companies that act as the agents for the end users, basically. I call them distribution companies, they are often called load-serving entities, retailers, whatever you want to call them, but these are the companies that do their buying on the wholesale market.

I think it is a really important area that is underappreciated in the electricity industry. It is

certainly an issue in the natural gas industry, too, but because market power is so much less a concern in the national gas industry outside of pipelines, I think it is a little less critical there.

When I had floated this sort of title and description of what I was going to talk about, I got feedback, I think it was from Ed, about that this was some academic sounding exercise, so I feel the need to motivate the topic that this is actually a pretty important real-world topic, and that is this picture here, which unfortunately the panel cannot see, but imagine prices in California versus two other markets that I have studied. I will tilt the computer.

This is prices in the three organized markets, PJM, New England and California, between the period of 1998 and '03. And what really stands out from this picture, obviously, is this Mount Everest of prices that you see in the middle, which is California during the crisis period of 2000 into the spring of '01.

I myself and colleagues have done a lot of work trying to measure the extent to which these price increases were attributable to increases in costs, marginal costs and those sorts of elements, pollution costs, those sorts of things, and to the extent they were attributed to increases in market power or changes

in the level of market power in the different markets.

One thing that comes out in this analysis is that in these three markets, although none of them could be called perfectly competitive, certainly you have the fact that California's was in a whole other realm in terms of the lack of competition, relative to these other two markets.

The other two markets had periods in which there were competition problems, but nothing approaching the kinds of things we saw in California.

So, one thing that has been motivating my research over the last three years is trying to figure out why that is. Why is it that California was so much less competitive than these other markets, when as was discussed yesterday, most of the common factors that are pointed to, customers who do not have real time meters, fixed price retail rates, tight reserve margins, all those factors actually were shared by all three of these markets during this period. Yet we see the market power being so much more severe, not just quantitatively, but qualitatively.

I don't have a picture of this, but one of the other effects of California is that you saw higher levels of market power in almost all levels of demand, except the very highest levels of demand, relative to

the eastern markets where the market power was manifested almost exclusively during the periods of very high demand.

So, qualitatively, the markets were competitive in different ways, and quantitatively certainly California was much less competitive, and, you know, I have been working for a long time trying to figure out why that is.

The answer is, back to this academic boring sounding title, I think it really comes back to the extent to which there is forward contracting in these markets. It might have been a historical fluke that these other markets were heavily covered under forward contracts as a result of the transition period, but certainly going forward as you study markets outside of the United States, one of the features that you see is that there is a very high level of price hedging in all these other markets, and that seems to have a very strong relationship to how competitive those markets are.

So, I, and I know a lot of other folks have come to the conclusion that a critical part of the competition equation in these markets is to have a lot of the transactions happening on the forward markets. I think this is, part of the motivation, this is part of

the cause of the electricity crisis, probably the primary cause of the electricity crisis in California, and I think actually it underlies a lot of the motivations for capacity markets in the eastern United States, where I think it is almost a misdiagnosis. There is fear that there is not enough money going into instruments that could finance power plants.

Well, long-term contracts for energy, we know, are pretty good instruments for financing power plants. But for whatever reason, it is viewed that there are not enough of those kind of contracts out there or at least in the right places to build new power plants and the response has been capacity markets, which I think may be a misguided response.

So, what I want to cue up, I am going to do a summary here, because I didn't think I would have time, but it looks like I will, that basically the first point is in energy markets, the key to competition or one of the real keys to competition is having a lot of fixed price forward contracting between wholesale buyers and wholesale sellers.

However, in the United States at least, retail competition is not what some folks thought it was going to be, and so what wholesale markets are in the United States, in both natural gas and electricity, is a

dynamic between let's call them market-based sellers, if you do not want to call them deregulated, and regulated buyers. Distribution companies who are buying on behest of their end use customers, but are themselves regulated. States are really searching for a mechanism that can reconcile this issue. How do you make a regulated buyer of electricity care about the wholesale energy price or at least care about it in the right way?

I think some of the regulatory and maybe just institutional legacies of regulating electricity companies seem to be contributing to this perceived problem. I think it is a real problem that there are not enough contracts being signed. I am going to ask Ed later, and I would actually like to ask the whole panel what, you know, whether they believe in this myth that there are not enough wholesale power contracts being signed by load-serving entities, whether that is true, and if it is true, what they think the source of the problem is.

I had just thought of the issue of what exactly the role of co-ops are and how their incentives are different from regulated utilities. I am sure we will hear from Ed that they operate much better than regulated utilities as wholesale market buyers and we will see if there is any disagreement to that

perception.

MR. TATUM: That's right.

MR. BUSHNELL: So, the big problem here is getting wholesale buyers to sign contracts, especially when they are regulated and they maybe on the surface do not care about prices. Why hedge prices if you can just pass them through, if you have a regulatory guarantee that you will recover your costs.

So, that's where I am going. What I want to do is just talk a little bit about the underlying competition theory behind this, and that is basically idea that when you are a generator and you sell power on a forward contract, at a fixed price, if you sell it at an index to a spot price, that does not help a whole lot, but when you lock into a price, a fixed price ahead of time, you are just much less interested in trying to raise the spot price, because you are not selling anything, or not selling much on the spot market anymore.

So, the whole idea of market power is you reduce your output to raise the spot price, but if you are not going to sell anything on the spot market, it is a loser to reduce your output to raise the spot price because you already locked in a forward price. So, behavior on spot markets is very much influenced by how much sellers

have sold at fixed prices in forward markets.

It also gives this weird game theory dynamic where basically if one seller sells contracts in a forward market, it is a signal, if it is a public contract, it is a signal to all of the competitors that this company is going to act very aggressively on the spot market. It is going to compete pretty aggressively, and that threatens the other competitors into also wanting to sign forward contracts.

So, there is, I think, a meritorious dynamic that starts to create itself, when there is a lot of forward market activity in markets, and that is kind of a dynamic we would like to see in electricity markets, but for whatever reason we are not seeing enough of.

There is an interesting related point that since we are at the FTC I wanted to bring up having to do with how this relates to vertical integration. One of the things you see internationally that is happening is more and more re-integration, and this is not the vertical concern that most people talk about electricity where it is ownership of generation and transmission, but integration between retailing and generation, which is a big issue in the petroleum industry, where some states do not like to see big oil-owned gas stations.

There has been a lot of literature about

vertical integration between retailing and wholesaling in the petroleum industry, and usually the dynamic works where you think about a trade-off between eliminating this thing called double marginalization where there is an inefficiency if you have two firms with market power selling down to each other in a vertical stream, versus the risk of raising rivals' costs. A vertical integrated firm might want to try and keep product away from its other retail competitors, and all of these models, like the models that have been applied to the petroleum industry, focus on a paradigm in which the retailer buys stuff from the wholesale market, thinks about the price it paid and then marks it up and sells it to the consumer.

It is a paradigm that fits, the timing fits the model of a gas station. They get delivery, they post their prices on the street. It fits grocery stores, it fits a lot of retailing, but it does not fit the utility industry really well. In the utility industry, the common model is there is some kind of subscription that is made. You sign up a customer for some period of time under some kind of contract, and in many cases, that contract is for a fixed price, for some duration of time. And in that sense, a vertical integrated firm now, when it signs up retailers, is actually taking on a

form of fixed price forward obligation.

If I sign up a customer and I guarantee them a price for two years, that's like selling power on a forward market literal contract for two years. So, in that sense, there is perhaps a positive aspect to vertical integration between generation and retailing that you do not see in other markets where the timing is reversed.

I also want to throw that out to the panelists who may or may not agree. I know Frank is still arguing with me about this point. So --

Let me just give you a couple of pictures that is going to try to motivate why I think contracts played such a big role in the differences between electricity and market performance. This is the first time I have ever been at a conference where somebody has presented my slides before me. You actually saw some of these yesterday, but I am going to give it a different emphasis.

So, what we have done is we have looked at all sorts of different models of competition, one of which is perfect competition, which we do not necessarily expect to see, but we would sure like to get as close to as possible, and it is definitely something that we want to know how far away from we are if we can.

In the electricity industry, we can do a much better job of measuring that sort of thing than in most other industries. So, what we have done is an exercise of trying to look through detailed data of market outcomes, input costs and all those sorts of things, and basically reconstruct a hypothetical competitive outcome, and then also look at other types of oligopoly outcomes, which just means imperfect competition between firms that are not colluding.

There is an economic theory that basically says these outcomes can range anywhere between perfect competition and at the high side a form of competition called Cournot which is conveniently much easier to calculate than other types of models.

So, the idea is basically you can talk about market rules, you can talk about market monitoring, restricting your ability to bid, two times what they bid off peak and the types of things that Frank talked about yesterday, but really what those restrictions do is they place the outcomes somewhere in this gray area between the balance of perfect competition and the worst that unilateral competition or unilateral market power can give you.

But when you start overlaying contracts into this market, what you have is a reduction in the range,

so that the range between what the unilateral market power outcome might be and the competitive outcome becomes much reduced, and I would argue the scope for the impact of market rules gets reduced, because the market structure is taking over in terms of its influence on market outcomes.

So, here are some pictures about the retail and generation relationship between markets, and the critical thing to remember here, in 1999, and I am studying '99, what is interesting is we started this project around 2001, 2002, where basically the perception was PJM was a great success, California was a great disaster, New England was somewhere in between, but people were not very unhappy with New England. We started off sort of saying, well, why do people like these eastern markets and they did not like California? Now, you know, I am at this conference where everybody is complaining about PJM, and so it is an interesting question about whether these increases are actually -- how much these increases that we have been hearing about are due to increased market power, and how much are due to rises in costs. This is actually a reasonably knowable thing. I haven't done it, but I am hoping some folks do. I have actually worked with the New England ISO on models like this, so I assume they are doing

something like that.

Back in '99, though, what we had was a feature where most of the generation had yet to be divested or was transferred to merchant affiliates of the same holding company. So, what you had were firms that were integrating into both supply and retailing, and importantly their retailing was under a fixed rate. So, they were limited at the price they could charge on the retail level, they couldn't just pass on wholesale power costs, at least not immediately.

What you have in PJM is relative balance between suppliers and consumers. New England is an interesting case where there are two big suppliers, and by the way, concentration of supply, traditional antitrust ways of thinking about market structure, PJM is actually the most concentrated market of the restructured markets in the United States. By traditional antitrust measures, it should be the worst from competition perspectives, and that it was not means that we need to think about some other dimensions.

New England is not so great either, we had two big suppliers in 1999, one was Northeast Utilities, which subsequently sold off its generation the next year, and the other was PG&E which had just bought into this market. What is interesting, though, is that these

two big generators in the market were also even bigger retailers. Again, in this market, they had restrained ability to raise retail prices, or in the case of PG&E, they had taken on an obligation to serve their customers at a prenegotiated price. They couldn't raise prices.

So, you had big suppliers in this market who had an even bigger incentive to actually keep prices low. In fact, in this market, what you can see in markets where a firm is both a big generator and a big buyer and an even bigger buyer than a seller? It is an incentive to want to lower prices, but you have to have the right ability to do that. You have to be able to basically flood the market with generation in order to influence prices down.

You do see a little of this in New England. In California, what you have is two really big retailers, PG&E and Edison, which sold off almost all of their generation. So, while California on the supply side is relatively unconcentrated, actually the least concentrated market in the United States, you also have all of these sellers with almost no retail obligations at all. Where the firms that do have the retail obligations, do not have much generation left, and the generation they did have left was all baseload, hydro, nuclear, that sort of thing. It is hard to flood the

market with generation that would be in the market anyways at all hours.

So, the ability of these firms to protect themselves on the wholesale market was very limited. The incentives of the firms who were sellers were very strong to actually raise prices on the spot market.

So, what we have done, I showed you the sort of conceptual picture here, is try to calculate these bounds numerically, looking back at hour by hour market outcomes, and this is the pictures that were shown yesterday. I want to highlight a couple of things.

The top lines here, the solid black line is the actual prices and the sort of lighter gray line traces what this Cornell equilibrium, the worst case kind of unilateral market power would be.

At the higher demand levels, as you go to the right of the screen in this graph, you get to the point where demand is getting higher and higher as a percentage of the peak for that summer.

What you see is as demand gets tighter, the actual market outcomes approach Cournot and actually match Cournot reasonably well. This is, again, assuming no contractual relationships at all, no retail obligations taken on by generators in this market, which in California, was the case. The generators did not

have any kind of retail obligation.

Now, in New England, what we did is we looked at what if all the sellers in this market had no retail obligations at all, and that is where you get a Cournot outcome that is way above the actual market price. Again, it is a concentrated market. If you looked at just the traditional antitrust market structure factors, you get a really uncompetitive outcome. PJM, it is even worse. Basically those eight firms that were the dominant suppliers in PJM, if they wanted to, probably could have set the price at the price cap almost all the time. But they did not want to, because they were large buyers on this market as well as large sellers, and a lot of these times at low demand, they may have been buying more than they were selling. So, you are not interested in raising prices when you are buying more than you are selling, you are interested in lowering them if you can.

So, what we did then is we threw in the vertical arrangements, at least the ones that we knew, the ones that were public that would happen with the sales of these generation units and also reflected the vertical relationships between generation and retail.

What you get is this bound, the theoretical upper bound on competition is greatly reduced and

actually maps reasonably well to the actual price outcomes again. PJM, again, you see market power is actually rising quite a bit at high levels. This was 1999, this was a summer in which there were several hours at a thousand dollars in the PJM market. The price actually averaged $100 during that summer in one of the months, but it was one month and the firms were relatively covered, so there wasn't the kind of financial crisis that we saw in California from these high prices.

Again, when you throw in the vertical arrangements, you get a substantial reduction in this upper bound of what market power can give you and it matches the outcomes reasonably well. So, these pictures were spun yesterday sort of saying, yeah, these markets are reasonably competitive. I want to say that this is what the market would look like if you did not have the forward contracts in PJM. It would be really ugly. So, what appears to be driving a lot of this is the fact that firms who are able to drive up prices do not necessarily want to because of their forward commitments in the market.

Now, an interesting question that I haven't looked at is whether those, you know, we looked at 1999 in part because of data availability on what kinds of

commitments these firms have taken on. To the extent these commitments change, and we have the end of retail price freezes sort of rolling in in all of these eastern markets, it is an interesting question to see how that has affected firms' behaviors and whether that is contributing to some of the complaints that we are seeing in some of these markets now.

This is a unique talk, I have two summary slides in one talk. The punch line is, again, that forward contracts matter. I wanted to convince you that we really want to see wholesale buyers, either vertically integrated and not really able to easily raise prices to their retailers or somehow signing fixed price contracts. That's easier said than done when we are dealing with a market world that buyers are regulated distribution companies.

So, the question is how do you do that? How do you give them an incentive to hedge forward prices? Well, one idea that economists like to talk about as incent of regulation is just give them a rigid price gap and say, look, I do not care what happens, you can only charge your customers 10 cents a kilowatt hour. That gives the company a really strong incentive, you would think, to hedge their price risk. They have all these customers on the one side, and they cannot raise prices

for them on the supply side, boy, they have a lot of risk if they do not hedge that.

Unfortunately, what happens if the actual wholesale price rises above that rigid price gap and the company has some kind of obligation to serve its customers and can argue in court that it has a right and an ability to cover those costs, even if it had negotiated some kind of price gap. See California for that story.

You end up with a bankrupt distribution company that stops paying for its generation and you have suppliers that are not that interested in generating to a market where they are not getting paid.

So, an alternative that was proposed by San Diego Gas and Electric in 1999, was let's come up with some kind of benchmark regulation where we go out and sign forward contracts, and if it turns out that our contracts are cheaper than the subsequent index price, there is a bonus paid to our shareholders for being smart and for buying in the forward market.

It sounds like a good idea, and this is something that we see occasionally on natural gas, where natural gas companies, same thing, how do you give them incentive to hedge retail prices, or wholesale prices? Well, you can gauge them against a benchmark. The

problem is that some of these companies are really big buyers, and so they themselves can influence that benchmark. We heard some, you know, some talk about the natural gas indices, which certainly seemed to lose their accuracy, let's say, during that period, and I think a big contributor to this was the fact that certain critical regulatory mechanisms like the price cap in California, the electricity wholesale price cap were linked to these indices.

Whereas perhaps in 1995, companies all had a joint interest in having the indices accurately reflect wholesale prices. Part of it was that they did not have a direct economic interest in the index looking high, and when you tie a regulatory outcome to these indices, then the incentives to try and distort the indices I think really go up. That is what could happen with these kind of benchmark regulations.

In the case of San Diego, the concern was, well, okay, if we award San Diego based on an ex-post comparison of their contract price and say the Power Exchange Southern California price. Well, they are the second biggest buyer in Southern California, so what do you have when an auction outcome where both the sellers and the buyers actually do better when the price is high? That was kind of an auction problem that

economists haven't quite solved.

So, there is this issue of being able to influence the index, and it is tough in a lot of industries where you have really large distribution companies to find indices that are not subject of distortion by the buyers.

So, where does that leave us? Well, one option is retail competition, actually. That was sort of one of the ideas. When you look at a list of what retailers are actually supposed to do with electricity, it is hard to come up with anything that makes any sense, and this is sort of the list that John was showing you about the normal things about a savvy consumer. They do not make sense in electricity. Shopping around, well, the wire is coming into your house.

What they do, what retailers could do is provide risk management in a way, and in a well-functioning retail market, theoretically, these retailers would have a pretty strong incentive to try to hedge their price risk. So, retail competition, I think, if there is any justification for retail competition, it is to try and solve this problem of how to give the wholesale buyers an incentive to hedge their wholesale costs and to care about wholesale costs.

Absent that, we have these other mechanisms that

are being experimented with, like the basic generation service auctions that we have seen in New Jersey, Illinois and other places. What is interesting is I come from California where we have a very untransparent mechanism that is evolving, which is we let the utilities kind of negotiate their own deals, the PUC is overseeing it in a very ad hoc way and we are hoping it does not result in too wasteful an outcome and it kind of looks like the old regulatory process, in a sense.

So, the BGS option looks pretty attractive in comparison to that model, and yet there is a lot of unhappiness with BGS. I guess I do not know how much of that is just a desire to shoot the messenger, the BGS auction is giving you a price, you do not like the price and how much of that is the auction and how much that is the underlying market structure is a good question.

I think one issue that has not been talked about nearly enough, is not so much the fact that we are holding an auction for the retail service, but what it is we are auctioning off. In these auctions in Illinois and New Jersey, basically the obligation that is being taken on by the seller is a requirements contract to serve all comers at a fixed price for three years, let us say, for some fixed duration of time. So, when you are a winner in the auction, you are saying, okay, I

will charge a rate of 11 cents, and anybody who wants to migrate back, I have to serve them, and plus if it is really hot, prices will go up and everybody will be using more electricity. So, there is a strong correlation between prices and the number of customers, number of megawatts I need to sell at this fixed price.

This creates a risk premium in the sale. No one really knows exactly how big a risk premium that is, but I think a real question we would like to see explored is what would happen if we held a BGS auction just for a fixed quantity, instead of just saying you have to serve all customers under any circumstances, let us hedge a fixed quantity and see what that price looks like, and then we will know how much of this unhappiness with the BGS auctions is coming from the structure of the contract that is being sold and how much of it is really the underlying market structure and the auction mechanism itself?

Then lastly there is this issue about in restructured markets we seem to be going towards a model in places like Australia and the UK where we have national companies that are in both generation and retailing, and ideally they would be evolving towards a retailing model where they are signing up customers in kind of a cell phone model, a three-year contract,

customer cannot leave without a penalty, but they get a guaranteed rate for those three years. That really limits the interest of the generators in exercising market power in the forward market, whether the market power has just shifted to the retail market is another question.

It is an interesting model that seems to be evolving organically in other parts of the country. I do not know whether this is something that we will see in this country because I think the legacy of regulation on the retailer side is probably going to be how we go forward.

So, I would like to pose for this panel this question about how do we get the wholesale companies to buy in the wholesale market at prices that are locked in under some future contract? What is the solution to that sort of thing? I think finding that out is really critical to trying to get markets to work better going forward.

I am going to leave it at that and we can maybe open up the discussion and then take some questions from the audience. Thank you.

MR. ANDERSON: Would you repeat the question?

MR. BUSHNELL: Okay, there were lots of questions there.

MR. ANDERSON: No, I have got the question. I will make a couple of comments to begin with, and I think that you have got a real, real problem. I think you put your finger on a real problem, that there is not enough forward contracting, but to us at least there is not enough real forward contracting.

In the eastern markets, at least, the first kind of things that were counted as forward contracting were really contracts that were negotiated when the generation was divested. They were fixed price and they made sense probably, but they are all running out. The problem, at least my members are telling me over and over now is, they are offered contracts all the time, it is just that the contracts are at nothing but the expected L&P prices for whatever the future time period is, plus, of course, a very major risk factor because the generators may have misestimated what the L&Ps are going to be for the future, and plus the administrative cost, because you have to add all that in, but large industrials, and I would let Ed talk about his kind of people, but all our people say, well, why pay the risk factor in the administrative cost if it's going to be at L&P prices. We can just ride the spot market.

MR. BUSHNELL: How about the spot market?

MR. ANDERSON: But that does not make sense, so

we are not signing any contracts. You get into this fight that the generators say, well of course we will sign contracts, we are offering them all the time and the customers are saying, yeah, but you cannot get any contracts that make any sense.

MR. BUSHNELL: So, the generators do not want to sign contracts that would lock in a price?

MR. ANDERSON: You have completely lost anything having to do with fuel diversity, you have lost anything having to do with load factor, you have lost anything to do with anything. The main thing they want to do is estimate what -- mainly generators, there are some that are not happy with the spot market, and day ahead and spot I kind of lump together in this sort of thing, but there are many generators that are very happy with them. Many very big generators that are very happy with them. I would understand if I were in their shoes, I do not know that I would want to sign anything either that voluntarily required them to take anything less than that. I mean, what we have set up is a structure that benefits the generators and it just does not give any real leverage to the people that are buying.

I would think that is for LSEs, but it is certainly true for large industrials. To me, at least, what the problem there is you have got incredible local

market power in and L&P environment. If you take a PJM classic, my understanding is that the original PJM footprint has about 1,800 different nodes in it, and if you have got 1,800 different nodes, you are going to have areas where there is real transmission congestion and there is very, very few sellers in those congested areas.

The larger the number of nodes, the greater the local market power that there is going to be. We also have vertical integration of generation and transmission where one entity owns both the generation and the high-cost generation that is behind the congestion in a load pocket, but also own the transmission. If generation is 70 percent of the cost and transmission is 10 percent of the cost, you are not going to be able to give very much FERC incentives to the owner of the transmission to mitigate the congestion when what that would do is reduce the congestion, the congestion would be gone, but the generator would be forced to compete in a much more competitive environment.

So, as long as we have the vertical integration, we are going to have these congested load pockets, it seems to me, and therefore, the problem of future contracting, at least in these areas, is the same thing. We recognize that the solution to this is extremely

difficult. We do not think that we are going to be able to eliminate transmission congestion. We can get rid of some of it, but just the critical ones are not going to go away. We are not going to get rid of vertical integration.

So, what we're saying is you've got to find some way to make it unattractive to either the generators or the load to be in the balancing markets, which is day aheaders or spot markets. I do not know how to do that. I mean, regulators can't do that things are not just and reasonable, and for them to come up with unjust and unreasonable spot markets to drive people out of it would probably be challenged and have a real problem. It would seem like that is what we have got to do.

We have got to find a way where the penalties of being out of balance are so severe that the generators say they do not want to be there, load does not want to be there either, and then I think you will find people coming together saying let's negotiate, what is it that you want, what are the terms and conditions that you want, and then we will probably start finding that.

I think your point on SLEs having to have customers being able to shop around is also true, as long as the LSE knows that they have got a complete customer base that is captive, we are back to old

regulation and they are not going to have any incentive to try to do anything either. You cannot just take customers today and throw them on these flawed markets. That does not make sense either.

So, it is kind of the catch 22. We have got to fix the markets before you can at least in my way of thinking, force customers to be out there. You have got to make then the spot markets unattractive, and by doing these kind of things together, pretty soon you are finding that the generators are going to start talking to customers either through LSEs or directly to them.

MR. BUSHNELL: I guess I was trying to pose a loaded question in terms of whether retail choice solves this problem or not.

MR. ANDERSON: My answer is it does not. It absolutely does not.

MR. BUSHNELL: It does not?

MR. ANDERSON: Yeah.

MR. BUSHNELL: But you think it actually contributes in a positive way rather than a negative way?

MR. ANDERSON: If you could fix the markets, then retail choice would be a necessary, probably not sufficient condition. You would have to take care of some other things, too, local market power would have to

be mitigated and transmission would have to be taken care of and things along that line. But it clearly is a necessary condition. Whether it is a sufficient condition, I hesitate to say.

MR. BUSHNELL: Because one of the things you hear, also, is the risk migration is one of the reasons held up as to why load-serving entities do not want to sign forward contracts, that they would lock up generation, and their customers would leave them under the wrong conditions. A counter-argument would be, well, at least you own some generation and whoever they migrated to is going to need some, but apparently this is a story that you hear quite a bit and it seems that at least they believe it is true, and so I do not know.

MR. ANDERSON: Yeah, but if you had a competitive market, then we have a whole different mind set. I mean, my members do not have captive customers. I mean, I love to talk about back in the days when stranded costs was the big thing, General Motors used to say that they had the largest stranded cost ever. They had more unused assembly capacity than Chrysler ever had operating. I mean, that is just the way people operate. Risk is taken in a different way. Risk is assumed in a different way. You do not just go out and fix one or two things, and then assume that we have got this fixed.

You have got to fix the whole thing. It is a bundle.

I certainly sympathize with LSEs right now. Right now, if you force an LSE to do something, but allow customers to migrate, the LSE is in a bad shape.

MR. TATUM: I worried forever since I found out I would be on this panel that somebody would ask me the question about that, and so what I did is turned to one of our smart guys and I said, well, why are we not doing long-term contracting? He says, well, basically, Ed, the world has changed. Again, as I was speaking, I made a reference that I did start in this industry back when it was still the old school, not for much longer, but I did, and so I have a memory of that.

Back then, the whole cost basis of our industry was a vertically integrated regulated monopoly. We had a different degree of volatility, i.e. little. We had the profit that we would get was dependent on capital investment. So, clearly we had the opportunity for self building or to go into long-term contracts.

In fact, that is how we got into the coal-fired power station that we ultimately put in service in 1992, a brilliant man said, look, these are what our projected costs are for the next 20 years, and we can either go long term or we can build a plant and you can own it, we can own it, you can build it, we can build it, you can

operate it, whatever, however it works. By doing that, that was our approach to a long-term solution.

Now, based on this new market design, that has been provided, we see the dearth of long-term contracts as a direct result of that new design. It would be a significant risk over the long term, you have got much higher volatility, something called counter-party credit issues, how long can these guys stay in business, and retail choice is an issue. You know, we say that there has not been a success, we had rate freezes that kept the prices dampened for a while, and now some folks say that, oh, it's grand news that rates went up 70 to whatever percent in Maryland, so now that we can have a real meaningful choice. I don't think that is good news for consumers.

So, we talk about the markets behaving competitively, and I think the wholesale markets do seem to be behaving competitively, but the concept that consumers have benefited, I do not know if that is indeed the case.

I think there is also, from guys like me and guys who came before me, we call them DOUGs, okay, we are dumb old utility guys, and what we think, and believed, was that a long-term contract would actually result in an actual lower price. I don't think that is

the reality anymore whatsoever.

Then one other thing that has changed, again, is costs used to be based on average costs, and we earned our profits on capacity. Now we have our prices based on marginal cost, and a lot of the costs and profits are being earned on energy.

So, it is a hard question, and clearly I don't have an answer to it. I do like the way electric cooperatives are structured. I think that, again, we have always had the direct consumer focus, if you will, from a reactionary standpoint. We have reacted because our shareholders and our consumers are one and the same.

MR. BUSHNELL: Let me ask, I guess it was argued that the existing suppliers do not want to sign fixed price contracts. Is there an opportunity to bring in new entrants, at least down the road, under this kind of model? Maybe you guys.

MR. ANDERSON: I would never say that the existing suppliers do not want to sign contracts. They tell me all the time --

MR. BUSHNELL: But they want to sign contracts indexed to the L& you are saying?

MR. ANDERSON: Sure.

MR. BUSHNELL: So, they do not want to hedge a price?

MR. ANDERSON: That is the way we would look at it, yes. Now, would that bring in new suppliers?

MR. BUSHNELL: Well, I guess I am saying you could probably find a new supplier who would very much want to have some kind of price guarantee, because the risks they face are very different.

MR. TATUM: It depends whether you would have to put a reliability pricing model in play.

MR. BUSHNELL: I guess I should ask you that question, too, do you think the RPM actually discourages energy price contracting or encourages it?

MR. ANDERSON: I think that the whole concept of forward capacity markets just makes things absolutely worse. I mean, because then what you are doing is you have got a generator that is making a tremendous amount of its money in the energy market and getting the rest of it in some sort of a capacity, it is a regulatory structure, it is not a market, it is a regulatory thing. Why would they want to do anything else? You have completely eliminated the economic motivations for the kinds of market forces that I think would bring about results for consumers.

MR. BUSHNELL: It has been an interesting conference, but I can't remember anybody who has actually defended capacity markets here, which is

usually the opposite of what I hear.

MR. TATUM: Outside the political reality.

MR. BUSHNELL: Let's take some questions from the audience, since one was gesturing broadly.

AUDIENCE MEMBER: I was just going to make the observation that every time I see John, he talks about how difficult it is to get a contract, and at the same time, I run into Frank and Jim and we talk about how great California has been since the crisis and how long-term contracts, really even with the shortages and without MRTU and all the same market design flaws that existed then have made things work.

So, what is it? Is California different because primarily the CPUC has forced the utilities to sign contracts? Is it the case that California is a different fuel mix? Is it because the market structure today does not really have much of a day ahead market with the same options that are available to generators here?

MR. BUSHNELL: I wish I knew. I don't think you can discount the relativistic nature of those comparisons. California, when people say, oh, that looks pretty good today, that is because they are comparing it to California in 2001. The same I believe with the eastern markets. Frank is scowling at that.

Do you think California is working really well?

MR. NEWSOME: It did in the calculation. I mean, come on. I think Harry hit on a good point, and you --

MR. TATUM: It relates to what John was talking about in the sense of I think the generators hate the real-time market as much as the load hates the real-time market in California, so perhaps in some sense that is providing incentive for them to get together with the loads before real time, because who knows what they are going to get in the real-time market, and so that may be one incentive, I do not know how big it is.

MR. BUSHNELL: Well, Texas would be the test case, because there is another market without a day-ahead market.

MR. NEWSOME: But certainly I think that the other issue is the legacy of the state contracts.

MR. BUSHNELL: Yeah.

MR. NEWSOME: Those are playing a huge role.

MR. BUSHNELL: We have our form of the transition contracts that the eastern markets had with the California contracts that were put in place during the crisis.

So, let me ask, Harry, I was going to turn it around, both of those guys standing against the wall

there, Frank and Harry, have proposed variations of a mandatory sort of contracting requirement for load-serving entities that would basically instead of a capacity product, it would require the load-serving entities to go out and sign a contract for some kind of hedge or fixed energy prices.

I suspect you guys would not be fans of that kind of mechanism, but I should --

MR. ANDERSON: Well, I would say that if there is no retail choice, then the point that you raised earlier, Jim, is what is the economic motivation for the LSE to do anything that makes any economic sense? It is just not there. I mean, they have captive customers, they will sign a contract and just flow the costs on through.

Frankly, Harry, I do not know California that well. I used to have a lot more members in California and they all shut down their facilities if they possibly could and moved out. The ones that did not move out were the ones that absolutely couldn't. I mean, the petroleum guys cannot move out because that is where the damn stuff comes up out of the ground, and so they have their own generators in there and they are generating tremendous amounts of their own power. But I find it very different. A couple of weeks ago at your

conference on market monitoring, I complimented at least the market monitoring part of California, but I limited myself to my compliments of California to the market monitoring model.

AUDIENCE MEMBER: Actually I missed the conference today and somebody came to my office and said that you were on the panel and said there is nobody from FERC here, so I walked over.

MR. ANDERSON: I appreciate that, Harry.

AUDIENCE MEMBER: But the thing that comes to my mind is it is not as much that people are not willing to do long-term contracts with you, it is more that if you do contracts at a given point in time, I think that is a mistake. When I worked for PG&E at the utility side and saw bankruptcy there, then I saw bankruptcy on the sell side, and there were long-term contracts and the counter-parties were not creditworthy. So, you are exchanging market risk with credit risk.

The question is good risk management has not really evolved the way people thought it would when we did restructuring, and the idea was that there would be good retail competition, there would be competitive LSEs that would give you these long-term contracts because prudence review, Jim talked about California doing long-term contracts which are reminiscent of the old

utility days, they are not very transparent. It is go to the CPUC, you have to get everything approved, there are RFOs and somebody asked the question if we are doing the world of RFOs and RFPs, why do you need an ISO? I mean, you could do that even without organized markets.

MR. ANDERSON: Well, the market has been questioning that a whole lot lately, Harry.

AUDIENCE MEMBER: No, but the most difficult question then is, that is it the question of like Jim had that figure yesterday, marginal cost was higher than average cost, and is it just the case that we are at the point of time now where you do not like the fact that the market price is higher than the average price.

MR. ANDERSON: Here we go again.

AUDIENCE MEMBER: And if these assets were with you as the customer, it wouldn't matter. It is because the assets were sold to NRG, I give the Texas example, what are they going to do? There is no way they are going to sell you at average cost, they are going to sell you at the marginal cost. The answer was, when divestitures were done, the gains from those sales should have been shared properly with rate payers and shareholders, and that wasn't the case, as we know, and often the forecast of gas prices that occurred when Center Point sold it to the private equity guys were

very different from when the resale occurred.

So, I am not so sure that it is entirely fair to blame FERC or blame organized markets entirely for the situation we are in.

MR. ANDERSON: I haven't blamed FERC directly, I simply said that the FERC jurisdictional markets are not meeting the needs of consumers. You can take it however you want to take it on that, but let me also say that just laddering contracts in today's flawed markets is not going to solve the problem. Sure, you do not want 100 percent of your contracts done today and then live with them, like what was it, 26 billion in California at the height of the market or whatever. We know that that is not the way to go. But just laddering them, doing a third of them this year and a third next and a third next with flawed markets is not going to solve the problem either.

Our members buy tremendous amounts of natural gas, they are in that market big time. Our members understand very well that natural gas prices have increased electricity prices. There is no doubt about that. But we really get pretty insulted when we hear people say that the only problem that you have got is that natural gas prices went up and that is the whole problem.

For a utility that has 80 percent of its generation in coal and nuc, and 20 percent in gas, if it were under traditional regulation, gas prices going up would impact the 20 percent that is gas fired and it would not affect the hundred percent. If you are in an organized market with a single priced auction and natural gas prices are setting the prices for 100 percent of the generation, then we have it going up for 100 percent of the generation instead of just the 20 percent.

That is an oversimplified way and, Harry, you know that very, very good and well, and I don't want to go on with it, but I just am saying, we have a bad situation, we have a flawed market, we have a whole bunch of things out there that need to be fixed. You cannot just simply say, let us ladder the contracts out there and solve it.

We have got to fix the markets, we have got to make the economic motivation be for the generators to truly want to find out what customers want. Ask them, what is it that you want? Do you want a 24/7 contract? Do you want one that is not 24/7? You know, there is a whole lot of different things that go along with this. That is just not going on now. We just have no -- we have no communication between generators and end use

customers. It gets blocked in the middle by a whole bunch of different things. Go ahead.

MR. TATUM: Oh, Harry. Two things: One thing just in general about contracts, we had a gentleman that used to work in our organization who retired, and his observation was that a contract was, regardless of the term, was only as good as long as both parties were really benefitting from it.

So, back in the old days, entities, when things were less volatile and things were a bit more straightforward with regards to the market and people knew what was going to happen, long-term contracts had a little bit more robustness, because the volatility and the uncertainty was much less.

In our organization, we have had numerous experiences where good contracts, all of the sudden because of the exogenous variables, turned bad. In that situation, even though the contract was still enforceable, it was not. All the good lawyers came out of the woodwork and got everybody to renegotiate and deal with it.

So, that is one aspect of long-term contracts in a highly volatile environment, which I think we are in.

The other aspect, too, is in trying to put together and move from a vertically integrated regulated

monopolies into a competitive marketplace, we have taken our industry and made it exceptionally complicated. I made a comment earlier, we have about over a thousand pages of tariff, over 500 pages of operating agreement in PJM. There is a stack of manuals that talk about how we do things within PJM and to understand that is Herculean.

Opportunities for people who really understand that, to make a lot of money, that is what it is all about, and that is how people are making a lot of money nowadays, and that is just the world we are living in. So, I think that is a primary motivation for the smart guys to stay out of long-term because they can keep the ball up in the air and keep the prices higher and keep the profits up.

MR. BUSHNELL: It is interesting. There are sellers in California who say, and I believe, are desperate to sign contracts. Calpine, and it is interesting to know why that is different in the eastern markets. We do not have a day-ahead, but I guess I have trouble believing that that is at the crux of it.

AUDIENCE MEMBER: You must offer, so why would the utility buy long-term at a high price? I can give you, you know --

MR. BUSHNELL: I think we are going to have to

take this discussion into the break, thank you all panelists, I really liked this panel, so I do not care if any of you guys did not like it. So, and Tony, I am sorry, I did not get a chance to get to the question I asked, which may either make you relieved or disappointed.

MR. MANSFIELD: I had written an answer, so --

MR. BUSHNELL: I am sorry about that, I would like to catch you during the break, then, and get your answer and then we will read it into the public record. Thank you.

(Whereupon, there was a recess in the proceedings.)

MR. NEWSOME: Good afternoon. I am Hampton Newsome from the Bureau of Consumer Protection at the FTC, and we are going to change gears a little bit here. This panel is on consumers helping themselves, and the focus will be on the individual choices that consumers make about their energy costs and about their green purchases I guess you would call it.

When we are talking about consumers, we are talking about a variety of different consumers, residential consumers, commercial, industrial, and we have a great panel that will talk about those various types of consumers, and these are choices that everybody

in the room makes all the time, whether it's for light bulbs or appliances, or if you are doing home renovations. Also, the energy you buy for your house, electricity, natural gas, and the transportation choices you make, the cars you drive, the types of public transportation you use.

A lot of this is focused on saving money and cutting down your energy cost, but there are also issues where consumers look to just make green purchases that they make to help the environment, and these are often made without regard to cost savings because they feel like it is the right thing to do. We will be discussing some of that, too.

Here at the FTC, particularly in the Consumer Protection Bureau, we have a variety of programs that are focused on these kinds of issues. We have labeling programs for appliances, the Appliance Labeling Rule, those yellow guides you see at appliance stores, the R-value for insulation, labeling for alternative fuel dispensers and vehicles. We also give guidance to industry members that make green claims about their products, recycling claims, that kind of thing, and we also have some guides for fuel economy advertising.

So, FTC, we are no stranger to these issues, and our panelists are not strangers to these issues, either.

We have got a great group and we are going to divide this into four acts, and act one will be David Gilles who is with Godfrey & Kahn and has extensive experience with energy policy in Wisconsin. After that, Maureen McNamara from EPA, she will talk about the Energy Star Program. Then Walter Brockway from Alcoa who will give us the perspective of a very large industrial user of energy and the kinds of choices that they make in managing those issues. We will wrap it up with Frank Wolak who has been heavily involved in the conference and he is going to talk about realtime pricing.

What we are going to do is everyone has about 15 minutes. We are going to try to wrap up by 5:00, and so that will leave us some time for some questions. That is all I have to say. So, let us start off with David Gilles.

MR. GILLES: Thank you very much. Good afternoon, and I would like to thank the Federal Trade Commission for the opportunity to participate in this panel. I am with a law firm in Milwaukee, Wisconsin, but I am here because for the last four years until last January, I served as general counsel with the Wisconsin Public Service Commission and have a perspective on states' implementation of energy policy that is very unique.

Before that, I worked with the Attorney General's Office of Consumer Protection in the Department of Justice, and my focus there was on consumer issues and antitrust issues, and I had the good fortune, or some would probably term it differently, to be involved in consumer and competitive issues when telecommunications was deregulated.

So, coming to the Commission and looking at energy policy in a state where on the one hand you have efforts during these four years that I was there where we had the introduction of MISO day two market, Midwest Independent System Operator, and yet continued with state regulation for retail rates, so I often compared the experience I had at the Attorney General's office in deregulating telecommunications with what we were beginning to experience at the Commission.

So, my focus, though, of trying to convey to you Wisconsin's experience and what state government can do to assist consumers with their energy choices is in two primary areas: The first is how the Commission assisted people in making choices about their purchases, and some of the programs that were developed relating to renewable resources and efficiency measures; and then the second I would like to just overview some of the consumer protection provisions that are in place.

So, in Wisconsin, we have what are called public benefits programs which are funded by ratepayers, and these are programs that really grew out of the reliability concerns in the late 1990s. In 1997 and 1998 in Wisconsin, we had threats of rolling blackouts, we had energy shortages that created a political climate that resulted in legislative action to revise our energy policy framework in the state.

Among the revisions in response to those concerns in the late 90s were our state planning process was revised, some would say, critics would say our state planning process was eliminated, but that is a whole other debate. There was strong support for investment in infrastructure in the legislation. We began the process of deregulation, our transmission was divested and we had an independent transmission company formed.

Wisconsin stopped that process and there are no signs that we are going to pick it up again, primarily in response to what happened in California and Enron. Along this way, there was also at this time a focus on trying to encourage energy efficiency measures, as well as renewable resources in Wisconsin, and that took the form in Wisconsin of setting a renewable portfolio standard for energy providers of 2.2 percent by 2011.

Now, at the time, we regarded that as a very

ambitious standard, and so that was part of the package that was passed. In addition to that, state-wide programs were set up to promote energy efficiency and renewable resource programs. The funding for these programs came from ratepayers, and were channeled to the Department of Administration to use for the purpose of supporting those projects.

In that regard, they would provide grants for energy efficiency projects and renewable energy projects for both consumers, residential users, commercial users and industrial users.

Now, this legislative action certainly did not solve the energy crisis in Wisconsin, although it was helpful, our concerns regarding energy continued, primarily during the last ten years the Commission has estimated that Wisconsin's demand, peak demand for energy is increasing each year at about two percent, and that translates roughly into a 500 megawatt power plant every two years in Wisconsin.

While we have added substantially to the generation and we have increased transmission, there was also an effort to look at what could be done additionally with respect to renewable energy and efficiency measures. That resulted in a collaborative legislative effort that led to more recent legislation

that did increase the renewable energy portfolio standard to ten percent by 2015.

It also imposed an obligation on the state for its energy purchases to meet a goal of 20 percent from renewable resources by that same year.

Finally, there was a revision of the state energy efficiency and renewable programs to improve access and to improve security with the funding. One of the problems that our state has is that our resources are very limited, and during this same time, after setting up state-wide energy programs, we had a budget crisis, as well. The consequence of that is that the legislature and the governor borrowed from the funds that had been gathered from ratepayers for energy efficiency programs and used that to meet the budgetary requirements.

Now, that created significant concern among stakeholder groups, and the consequence of that was part of this legislative package outsources the oversight or the program management and makes it subject to commission review, but the effect of that is the governor or the legislature are not going to be able to take those funds and apply them should future budget problems develop, and so it will be a much more stable source to promote energy efficiency and renewable

resource programs prospectively.

The type of programs that are involved include providing assistance and technical information to consumers, they promote solar and wind resources and they will provide grants for that, as well as on-site visits to assess installation of these projects. As I mentioned, they are available for each category of customer group.

Now, beyond these sorts of efforts in facilitating a public benefits program, the Commission also undertook, has recently undertook specific efforts to help consumer groups engage in the debate that's ongoing at the Midwest Independent System Operator. In Wisconsin, we have a system for funding intervenor compensation, interested parties that do not have the resources to participate.

Using that resource, the Commission has enabled our citizen utility board to participate in the stakeholder process at MISO, the Midwest Independent System Operator, this is one of the most difficult matters confronting Wisconsin, because of the situation Wisconsin finds itself in in not having made investments in transmission, having to import roughly 14 percent of our energy from other states. We believe that we are very vulnerable to the market and that we are not going

to realize necessarily the benefits from that.

So, it is really important to us to have stakeholders familiar with the process participate and be heard at the Midwest Independent System Operator.

There are additional state resources for people. The Public Service Commission provides both technical advice and handles complaints that are brought to its attention for individual consumers. The Department of Agriculture focuses on biomass as an alternative energy resource, and has a special directive in the most recent budget to develop that in Wisconsin.

Public utilities in conjunction with the rate-making process have developed renewable resource rates. Many of the utilities are fully subscribed. For these rates, people pay more than they ordinarily would for their electricity. There are also interruptible rates that go into effect in periods of high demand.

The utilities provide energy audits and consumer information for people and generally attempt to educate their customers in how to conserve energy. It is a difficult process. From the states' perspective, as I mentioned, resources are very limited. It is difficult to instill in people how to incorporate energy saving strategies in their day-to-day life.

I would, at this point, like to just touch upon

the consumer protection issues that might be encountered as people look forward to the energy market. With consumer protection, public attention to an area creates the opportunity, from my perspective, to recycle traditional consumer fraud schemes. Pyramid schemes, business opportunity fraud, investment schemes, entice consumers to get in on the ground floor before it is too late, and part with their money before they really know what they are getting, and in most cases, they are not getting much of anything.

Deceptive savings schemes and performance claims and home improvement scams are likely to be part and parcel of the new energy market. In thinking about this, it reminded me of the first experience I had when telecommunications was deregulated. I had been following the industry, and the first notion that I had that deregulation occurred were complaints about a multi-level marketing program that was recruiting people with the promise of unlimited free long distance service.

Indeed, that is what they offered to people. Each person got a card with an 800 number that they could call and they could supposedly use it for as long as they wanted and call anywhere in the continental United States. The only problem with the service was

that the company had five ports on a single switch to handle all the calls made to the number.

The consequence of that was where industry standards are usually call completion rates of beyond 99 percent, this call completion rate for this company was less than one-tenth of a percent. So, it was our first venture to what we were to later encounter under other names such as slamming and cramming and all sorts of consumer problems that developed as telecommunications was deregulated.

Now, we have not seen anyone offer electric service that has a reliability standard on the order of that multi-level marketing program, and I doubt that any person that became a member of that multi-level marketing organization actually gave up their regular land line phone service in the early 80s to rely on this card and this 800 number to make long distance calls.

I think it is something that we have to keep in mind as we go forward with deregulation in energy markets in that the benefits of competition are not realized by everyone in the marketplace and there are folks that are going to take advantage of an opportunity if they find one to offer you something that they are not really going to provide.

There are a couple of recent examples where

state attorneys general have focused on energy-related problems. Earlier this past month, the Illinois Attorney General announced that it is investigating Ameren regarding its promotion of a discount program that was soon to be continued. The Illinois Attorney General said they would take action if the investigation developed evidence under their Consumer Fraud Act.

The Massachusetts Attorney General brought a consumer fraud action involving a wind turbine promotor claiming that they failed to install turbines, and when they installed the turbines, they did it improperly at risk to the purchasers.

So, these are some of the actions that have been brought. Certainly in the past energy savings claims in the late 80s and early 90s prompted state enforcement officials to take action, and I suspect that you will see those re-occur from time to time.

The state agencies that deal with consumer protection issues, the state attorney general is in a unique position, usually responsible for state deceptive practice acts to deal with these sorts of problems. As was mentioned in the prior panel, the problem is that enforcement takes place after the fraud has occurred. So, it is always difficult to get people's money back.

MR. NEWSOME: You can have a bonus minute,

David.

MR. GILLES: The last one is just pointing out that the state and federal agencies cooperate very well in the area, and continue to provide information to each other to facilitate their efforts.

So, with that, I would like to thank you for your attention, and I will be happy to answer any questions later on.

MR. NEWSOME: We will try to do the questions at the end of the panelist discussion. Thanks, David.

Maureen?

(Discussion off the record.)

MR. BROCKWAY: Okay, well, I guess we'll switch and I'll talk a little bit about an industrial perspective. First I'd like to say thank you to the FTC for inviting me and allowing me to speak. The fact that I am here, I think is an example of customers helping themselves. We need to be engaged; we are engaged or we are learning to be engaged. Let's see if this works. All the little quirks on here are an engineer trying to do graphics, so that's me.

Let me first talk a little bit about Alcoa, who we are, what we do. Let me do a couple things, talk about Alcoa, who we are, what we do; a little bit about the history of helping ourselves; and then going

forward, helping ourselves.

Alcoa is a pretty large corporation. We are a $27 billion company, more or less, 428 locations worldwide. We are global, about 129,000 employees. These numbers are probably a year old, so I would not stand by them. I am sure they have changed.

If you notice on the map, we are still very concentrated in North America and in Europe, South America. That is where a lot of the business is. I have not got the slide with me, but a high percentage of our consumers and customers are in North America and Europe.

We are the largest producer of aluminum and aluminum products in the world. We are global, I have already mentioned that, presence in over 30 countries. The processes generally -- and I will not get into details -- we mine bauxite. That is taking red dirt out of the soil, the most prominent element in the soil. We refine the bauxite into alumina. Alumina is then refined into aluminum. That is a product you probably know. Then the downstream processes, I have not captured them all, but we roll, we forge, we extrude, and we sell downstream products, such as sheet and plate for aircraft, an aircraft is about 90 percent aluminum; transportation; motor vehicles; food packaging; foil; et

cetera. There are other products. There are a number of products you will certainly find aluminum in.

As I said, I fiddled with the graphics on this. Let's see.

Smelting alumina in aluminum, the reason I highlighted that is that is where we are electricity-intensive. The aluminum process is an electrochemical process. It is very electricity-intensive. Let's see what I have got on this. We call that smelting. Smelting capacity worldwide, and this is total smelting capacity of all aluminum producers, about 33.7 million metric tons annually.

As you can see, once again, North America is still a big market. It is the largest. 7.1 million metric tons are produced in North America. It is becoming challenging to continue that operation in North America with electricity prices and availability.

Smelting requires a very large amount of electricity. Typically a plant would be several hundred megawatts. It is not unusual for us to have a location that is 300 or 400 or even 500 megawatts of load. That is a big number, very high load factor. We are on 24/7, a very smooth load, which is attractive to suppliers, should be attractive to suppliers.

In the past, we used to say that electricity was 20 to 30 percent of the price of our product; now we say it is 30 to 40 percent, a significant increase.

A little bit about helping ourselves. How have we helped ourselves? In the past, what we did was self-generation, and a lot of the reasons we did that was we were there before the generation was there, so we built generation. At the turn of the last century, we built hydro-generation. We also built some transmission to go along with that. We were the first ones there. We predated the New York Power Authority; we predated TVA; we predated many others.

The middle of the last century, we built some coal-fired generation in the Midwest and in Texas. Again, it was the electricity -- we needed supply. The resources there we built around self-generation.

Other things we did to help ourselves, we sought out and acquired long-term electricity partnerships with suppliers, things like joint ownership of generation. We have several locations where we own a portion of a unit or a portion of a hydro system. We agreed to curtail supply. That is a form of demand response, but years back, we were willing to work with a supplier and say, "We will curtail our loading under given conditions to help the system," to help us get into a partnership.

We provided, as I said, large high load factor syncs for generating stations. That is an important thing for reliability of the system. If a generator knows that they have 300 or 400 or 500 megawatts of load available all the time, it helps moderate the system; it helps the reliability of the system.

So, what are we doing today? We have recognized a need to organize resources to monitor and participate in regulation, legislation, and market development. That is why I am here. We have formed a group, we have resources, we are sitting at the table, at the markets, MISO and New York ISO and IRCOT and at the PJM. We are certainly actively at FERC; FERC knows who we are now. We are active with users groups such as ELCON and others in various states and regions.

We continue to pursue our long-term partnerships with utilities. That is what we prefer. We much prefer to arrange a partnership with a utility for supply than to build our own. Self-generation is a last resort. We look for means to improve our energy efficiency. We have what I would say is a very robust energy efficiency program both in making our process more efficient and our facilities more efficient.

We offer assessments at facilities. We look for opportunities for them to reduce energy consumption, and

I think -- again, a year-old number -- globally, we have probably identified $50 million or more of opportunity and energy efficiency, not that we have captured all that. We have identified that opportunity for locations to reduce energy consumption.

I am going to go through this slide a little bit backward and start at the lower right.

On the process side, we have reduced the electricity required to make aluminum by 37 percent since 1950. That is a pretty significant number. We encourage recycling of aluminum. It takes 5 percent of the energy to recycle aluminum as it does to make primary aluminum. That is a little bit odd in that we make primary aluminum. We make money making primary aluminum, yet we still encourage recycling aluminum.

I don't think we can talk about energy without linking to climate change and CO2, a little plug for aluminum, we are 50 percent lighter than steel. Its use in automotive and other transportation will reduce consumption. Our challenge has been to reduce greenhouse gas, at the upper left. We have reduced greenhouse gas on the order of 25 percent. Our challenge is to continue that reduction while we grow our business, and we are trying to grow our business.

So, what are our options? We can reduce the

amount of energy required to manufacture our product. If we do that, we believe we have about peaked out on the process side; on the facility side, we can reduce more. We can seek out least-cost supply. Certainly we do. We do that globally. The opportunity these days has been more global than it has been on the North American continent.

We can do self-supply. We look at that; we continually look at that. We can do demand-response, which is becoming something we are paying much more attention to, things like interruptible contracts. I know those are traditional. We are able to interrupt our load. We are willing to interrupt our load if we get the right signals and we are treated as a generator is treated in the market.

We can curtail our operations. We can do that for short periods; we can do that for long periods. That does not come out expense. If we shut down production, we still have fixed costs, we still have variable costs, we still have a pretty high expense of restarting our operations.

We can participate in organized markets, which I think we are doing. We can be price-responsive; we like that idea. We supply reserves. By acting as a responsive load, we can provide reserves to the system

similar to a generator. In fact, we believe that we should be symmetrical with generators in how we are treated in the market.

We are experimenting now with providing regulation, working with Elkridge National Lab on being able to provide regulation to the electricity market. We should be experimenting later this year to see if we can actually do that. That would be fluctuating our load minute by minute to keep up with the power system. In fact, this morning there was a conversation about wind energy, and we believe that our load, being able to do that, could probably complement wind energy's flexibility in how often they generate.

With that, I would say thank you, and we will take questions later.

MR. SEESEL: I am going to fill in for Hampton just for a minute, because we have a slight technical glitch, as you probably have deduced already, and are trying to deal with it right now. So, I think we are going to take about a two-minute break and should be able to resume in just about a minute or two.

(Pause in the proceedings.)

MR. NEWSOME: While we are getting this booted up, since we are eating into our questions at the end, if anyone has a question for any of the panelists

sitting here, we can do that now.

Any questions?

AUDIENCE MEMBER: Mr. Brockway, you had said that there was a 37 percent increase in efficiency since 1950. Is that right?

MR. BROCKWAY: That's correct.

AUDIENCE MEMBER: How much of that is in the last five years?

MR. BROCKWAY: I don't know the exact number, but I would say the majority was prior to the last five years. We matured the process.

AUDIENCE MEMBER: I am just wondering how much efficiency, you know, was gained some time ago and whether that is still on the same trajectory or if it has flattened out?

MR. BROCKWAY: It is diminishing returns. That is on the process efficiency --

AUDIENCE MEMBER: Right, no, I understand.

MR. BROCKWAY: -- not the facility efficiency. I think we have tapped out.

MR. NEWSOME: Any others?

AUDIENCE MEMBER: I have a question. I think in one of your first slides you showed producing capacity, and I cannot remember what the exact figures were, but China's capacity exceeded that of the United States. I

was just wondering if you could comment on that and whether you expected that to continue in the future and at what rate did you expect the acceleration.

MR. BROCKWAY: I cannot tell you the rate. I can tell that in all likelihood, the capacity in North America will decrease, and China will certainly increase and is increasing.

MR. NEWSOME: I guess I have a question for David. In Wisconsin, with the RPS standards, how are those being met? What are the sources of generation? You said that it was at first 2 percent and now it is up to 10 or 20 percent, 20 percent for state purchases, 10 percent I guess total.

MR. GILLES: Well, wind is a primary source of renewable energy generation. In the last two years, the Commission has approved I think it is 400 megawatts of wind. Now, with the advent of the renewable energy portfolio, we saw two applications from investor-owned utilities. Prior to that, there was independent producers whose application was approved, but they have yet to begin construction. So, I think wind is the primary.

The wind regime in Wisconsin is not as good as it is to the west of us. The problem is that our transmission to the west is not very good either, so --

but that is a primary source.

MR. WOLAK: My question was of sort of how much of your capacity that you say you provide reserves with or you can provide interruptible with, I mean, how does that come in? Does it come in as essentially kind of continuously or is it discrete blocks? I mean, in other words, are you shutting down plants, or are you essentially tailing the rate at which output is increased? I mean, how does that work in terms of -- your comment about regulation was extremely intriguing, just because that is sort of a second response to essentially dispatch instructions, and I was wondering --

MR. BROCKWAY: Reserves and regulation are separate issues.

MR. WOLAK: Yeah.

MR. BROCKWAY: Regulations, as you know, is minute-by-minute response.

MR. WOLAK: Yeah.

MR. BROCKWAY: An ideal for us would be able to say on a -- very near to the event to be able to say we are able to offer a given number of megawatts of regulation up or down -- ideally our choice -- and be able to bid in the price at which we would do that. I am not sure if I am getting at your exact question.

MR. WOLAK: Well, my question was more of is it the case to provide the reserves at the places, is it that you are shutting down shift, you are shutting off a plant, or is it that you can really do the continuous down just like a generator can do? In other words, are you truly really -- you know, like, for example, the typical way that interruptible works is it goes away, and then once you do not need it anymore, it takes a while for it to come back.

MR. BROCKWAY: Actually, we would argue we are superior generation. If we are called upon to reduce load, we can do that very rapidly, and we can bring it back on very rapidly. So, if we offered -- pick a number -- 50 or 100 megawatts of interruption, we could do that in probably a minute or less.

MR. WOLAK: Yeah, that is the easy part.

MR. BROCKWAY: We can come back up in that same amount of time.

MR. WOLAK: Really?

MR. BROCKWAY: So, we believe that is superior.

MR. WOLAK: Wow.

MR. BROCKWAY: Now, we will have to do more experimentation to see how well we do at that.

AUDIENCE MEMBER: This is for Mr. Brockway. You said it takes only 5 percent of energy to recycle

aluminum. Can you describe the process?

MR. BROCKWAY: The recycling process? That is pretty simple. You remelt the aluminum and then recast it in whatever -- realloy it and recast it in whatever form, whatever product we desire it to be used for. And the energy is in the energy to do the remelting of the aluminums. It is typically natural gas to remelt.

AUDIENCE MEMBER: I had a question about the slide relating to Alcoa's reduction in greenhouse gases. I think if I read the slide correctly, it seemed to indicate that there was a pretty marked reduction to about a 25 percent reduction in the 2002 time frame relative to a prior point in time, and I am just curious, since it seemed to be relatively constant, that 25 percent reduction in the years since, whether there was some new technology introduced at that time to achieve that reduction in greenhouse gases.

MR. BROCKWAY: It was not due to the technology. I think it some of it -- actually, I need to do some research -- was due to curtailment of operations.

MR. NEWSOME: Well, I am going to break into Maureen's presentation and ask her a quick question, because I saw it was not on your slides, the slides that we are trying to pull up here.

Recently, the Energy Star Program announced --

and I may be getting this wrong -- but basically in the past, programmable thermostats, which have been seen as kind of a hallmark of energy efficiency, Energy Star is no longer certifying them or they have demoted them somehow in the program, and I was wondering if you would talk a little bit about that and that in the context of how important it is for consumers to have devices that are easy for them to use in terms of managing their energy efficiency.

MS. MCNAMARA: I do not know that the final decision has been made on whether or not there will be a future specification for Energy Star programmable thermostats. It all depends on how they are used, and we have conflicting data around the country as to whether or not folks are really gaining from a programmable thermostat absent some education about how they do work. So, regardless, moving forward, it will be very important for folks to know not only, you know, that this has features that can help you control your energy, but also, how to use it, and, you know, some of the problems that might be faced is if you move out and somebody else moves in, they don't have the guide book on that.

So, we think that it is very important to provide educational messaging, and there is sort of

mixed data as to whether these things are easy to use for folks or not. So, if there is a specification, part of, you know, labeling and helping folks understand how to use it and the simplicity of the user interface will be an important component.

MR. NEWSOME: Well, with that introduction, answering questions before her presentation, Maureen, I think we have got your slides up here, so why don't you come on up. Thanks.

MS. MCNAMARA: Well, thank you so much for having me here and for the technical assistance offered by my fellow panelist. It is much appreciated. I do have some pretty pictures to show, so it is nice to have the luxury of the presentation, but I was prepared to wing it if I had to.

Okay, energy demands continue to rise around the country, and there are higher energy prices than we have seen for a very long time. I was recently at a conference of some DSM managers, and one guy said, "Oh, well, you've got nothing to worry about. My consumers are facing 18 cents per kilowatt hour prices." And another guy said, "Oh, I got you beat, we are at 22 cents per kilowatt hour." Now, that is far above the national average, but it is not unheard of. These were both New England states.

So, reliability is also becoming an issue increasingly, again, New England and as well on the West Coast, and shrinking reserves in other parts of the country anticipated in, you know, the next five years or so, this all at a time when there is a lot of need for capital investment in generation and transmission; congestion relief in certain load islands or pockets; as well as uncertainty about what should be invested in by utilities because of potential climate change legislation. So, energy efficiency is emerging and has always been a very cost-effective solution, and we have got more than a decade of experience with energy efficiency. It can help stabilize prices, it can reduce energy bills, and it helps the consumers control costs.

Hopefully many of you have seen the Energy Star logo. It is now recognized by over 65 percent of consumers nationwide, and one in three households knowingly purchased an Energy Star product last year. They are also inclined to recommend Energy Star to their friends, with over 70 percent of the population saying they would, and 29 percent of the population saying that they are "extremely likely" to recommend Energy Star to a friend or a colleague.

Some of the solutions that we offer -- and I am going to focus my presentation on the residential

solutions, but we do also offer commercial and industrial solutions -- but buying energy-efficient products, buying energy-efficient new homes, and improving home performance through duct sealing, home sealing, and home-based retrofits. Today's consumer has an average $1,900-a-year expenditure on their utility bills, and with a combination of Energy Star measures, they can save more than 30 percent of that, or about 600 per year, on average, and it would be much higher in those states that are experiencing 22 cent per kilowatt hour energy costs.

So, some of the Energy Star products that are most in the consumer's line of sight these days are appliances, lighting, office equipment, home electronics. We have more than 40 product categories for businesses as well as consumers, and some of the business products, in addition to the office equipment, include commercial food service products.

We offer our program partners marketing templates, we do direct outreach to consumers, and we work with them to get the message out, and we offer performance specifications, which is very important to uniting the market around a common symbol for energy efficiency.

Energy Star new homes are more than 15 percent

better than code, and code is state-dependent, so in many cases, they are much more efficient than code, and they are verified as performing by home energy raters. We, again, offer outreach, marketing materials, training to builders, and technical assistance.

Home Performance with Energy Star, which is an emerging program in our suite, it is one of the few programs that we really does require that we have the utility or other energy efficiency program sponsor backing it, because it requires new infrastructure. Audit programs have been around for many, many years, but unfortunately, they failed to produce action in many cases, and with Home Performance with Energy Star, the information that a consumer gets is turned into action because the design of the program is to get the contracting industry able to deliver on performance.

The kinds of things that I am talking about are, for example, when you go into a consumer's house and you have IR glasses on and you can help point to their wall and say, "Look, you've got a big hole in your insulation," that is a big "ah-hah" for a consumer who maybe normally would not be looking at insulating their home as one of their first upgrades. We work not only to train the contractors through our program partners with energy efficiency program sponsors like Wisconsin,

but also to come up with the protocols for what it means to be a certified contractor. The work is also quality-assured, which is very important to ensuring that things are delivered, and that is another rule of the program sponsor, the local program sponsor that we work with.

When we communicate energy efficiency to consumers, we try to keep it really simple. It saves money. It is a wise investment. It also helps the environment, and it comes with features and performance features that consumers want. So, we are not looking for consumers to suffer. Energy Star products have all of the features that you want in your product. And because it is backed by the Government, the symbol can be trusted.

Our key messages, our strong call to action, practical advice, easy to look for and do. Look for the label. It is your choice when you are looking at energy-efficient products.

We also try to make an emotional connection. This is not just about your purchase today, but you are contributing to a better environment for the next generation, and we want to make sure and we work very hard to make sure that this information is credible and unbiased and to monitor our market and make sure that

Energy Star does mean energy-efficient and that our partners are using our tools very effectively and in line with our trademark, which is Energy Star.

So, how do we get our message out? A lot of different ways. I mentioned that in Home Performance, we work with utilities. Well, across the nation, we have been working with utilities and energy efficiency program administrators that are state-run, like Wisconsin's and New York's. They represent about 65 percent of U.S. households. These organizations are typically where energy efficiency has been made a political priority.

We also work with retailers. A lot of the purchasing decision is made in-store, about 70 percent of it, and a lot of the brand-switching occurs in-store, so it is very important to work with the national retailers. Lowe's, the Home Depot, Sears, Ace, Staples, Menards, Wal-Mart, Sam's Club, are just some of our many program partners, as well as a lot of the smaller local retailers. We do these national campaigns, and they help bring all our partners together, coalescing around a call to action.

Two of the campaigns, Cool Your World With Energy Star and the Energy Star Change a Light, Change the World campaign. One of the tools that we put out

last year as part of the Cool Your World campaign was this interactive tool, Energy Star at Home, and you can actually mouse over and see how to improve energy efficiency in your home. This is offered with other guides on energy-efficient heating and cooling, Energy Star home sealing, and a lot of advice for homeowners to take action, and this was a huge media success. It was picked up by a lot of the -- washingtonpost.com, msn.com, betterhomesandgardens.com, and it was very much a big hit last year.

Another campaign is the Energy Star Change a Light, Change the World campaign. It basically encourages customers or consumers to change out one or more of their inefficient bulbs to an Energy Star qualifying fixture, or CFL, and this was a significant cost over the life of a product. There may be a cost differential when buying, you know, a CFL over an incandescent, you know, maybe on the order of -- some of them are down to $2 now instead of maybe 30 cents a bulb, but, you know, they are going to save $30 over the life of the bulb. So, it's a really good investment for consumers.

Last year, 700 participating organizations, including governors and state energy offices, you know, proclaimed Change a Light Day. 370,000 individuals took

an online pledge to change out one or more of their bulbs, so about 800,000 bulbs, and you can see how this really begins to add up, with about $22 million in savings in electricity costs over the life of those bulbs. This is also significant in contributing to reducing greenhouse gas emissions.

You know, some of the fun stuff that came out of last year's campaign, for example, one of our partners, the Long Island Power Authority, hosted a contest, and they had kids out there singing "I am an Energy Star," and, you know, it might as well have been a major -- now I am losing the name of the -- oh, American Idol kind of contest. It was very cute and a lot of fun. Again, you know, Money Magazine, Entertainment Weekly, lots of publications around the country picked up on this very important, simple call to action.

Of course, it is very important, again, to get this out and in retail. Here are some of the examples of Costco and Home Depot and Menards and Wal-Mart, Sam's Club displays, that were out very visibly, and, you know, it is a big challenge to get that kind of visibility in a very competitive retail environment. So, you can see the kind of support that this effort has around the country.

We have had a lot of success to date. We have

been around since the early 1990s. Our program efforts have reduced about 5 percent of total electricity demand; 65 percent consumer awareness that I mentioned earlier. We have had over 2 billion Energy Star qualified products purchased, and one in ten homes now have earned the Energy Star. This is also an international program in many of the specification product categories that are compatible from one country to the next. The EU recently re- signed an agreement with us. Canada, Japan, Taiwan, Australia, New Zealand, are all partners in promoting Energy Star internationally.

I guess just to put that 22 cents per kilowatt hour in perspective, Energy Star programs, as they have been implemented by our utility and other program administrator partners, you know, are running from 1 to 5 cents per kilowatt hour. That is a lot cheaper than spending 22 cents per kilowatt hour if you are in the New England state -- I won't mention names -- but, you know, even nationally, the figure is more like 8 cents per kilowatt hour and probably rising and continuing to rise. I think, you know, we are hearing about rate cases throughout the country, and some folks are going to all of a sudden have a 70 percent increase in their utility bills. So, energy efficiency and Energy Star is

a very practical solution to help them manage and control those costs.

Thank you so much for your time.

MR. NEWSOME: Thank you, Maureen.

Frank, why don't we bring you up here, and you can go on with your presentation.

Frank has to catch a flight, so we are going to give you permission to take off after you get through. If anyone has a very quick question for him and it is before 5:00, we can ask him a question, but thanks for being here, and thanks for bringing your laptop.

MR. WOLAK: Okay, thank you.

Okay, what I would like to talk about is just following on the issue of how customers can help themselves, and in some sense, the idea here is that realistically, I think one of the missing ingredients in terms of restructuring is the fact that we do not allow customers to help themselves, and that is what makes markets work very well, and in some sense, the other thing about restructuring is the fact that customers, you know, need to essentially protect themselves, and so really a different role takes the -- occurs in terms of the regulatory process.

So, the first thing I want to really emphasize is the need for symmetric treatment of loaded

generation. I was very pleased to hear a load saying that that is what they wanted. So, I at least got one convert. And so, talk about the fact of just what we need to do is treat electricity like any other product. We can no longer give customers the free hedge, which is a fixed retail price set based upon the fact that all customers are being served by a single vertically integrated utility. That is just a world that can't exist in a restructured market even if you only have a limited amount of direct access for reasons we will discuss in a few minutes.

So, to talk about technological and regulatory barriers to this occurring, the major barriers, unfortunately, are regulatory, and then I will talk about something that is trying to -- an experiment that I participated in that is trying to make it a bit more palatable to customers, and talk about how actually this realtime pricing can really be used in a manner that large buyers can essentially help to discipline the ability of suppliers to exercise market power. So, in other words, it can be a fair fight, so to speak, between buyers and sellers.

So, the big issue with respect to restructuring is sort of two areas we think that the benefits will come, is one in terms of this market test for

investments, where we think that what is going to happen is that new entrants have got to figure out, "Can I make money given the prevailing prices? I don't just have to get the regulator to approve my costs and then I am done." The other is the issue of more efficient utilization of existing capacity, and I think that a good way to make the point is to say, "Look, if what you can do is put California's electricity consumption and divide it evenly in every hour of the year rather than put it in the hours that it actually occurs -- so, in other words, smooth it out by the fact that perhaps you have demand-response and price is varying -- then what you would find is that roughly you would only need about 30,000 -- less than 30,000 megawatts of capacity on average to meet demand."

As I discussed earlier, peak demand is roughly a little bit greater than 50,000 megawatts. So, we could stand with building a whole lot less generating facilities. We could avoid buying that peaker, typically the peakers are quite dirty as well as expensive. So, effectively what it is saying is by getting more efficient utilization, it has both greenhouse gas benefits as well as just sort of the fact that less generators need to be built.

The other is that the -- this is an even greater

benefit because of the fact that even though for all the reasons that I think the conservation sorts of efforts and Energy Star, what that is definitely doing is I think slowing the rate of growth of electricity consumption. So, to just give you kind of an example from California, is California's consumption is growing at about 2 percent per year, its peak's growing much faster, and peak demand is almost 8 percent higher than the previous summer in July 2006. So, active demand-side participation is precisely what can essentially address this issue of slowing the rate of growth at the peak, which means you have got to build peaking units to meet it or you can get the megawatt suppliers to come in.

Just to be clear, we are talking about what's necessary is realtime pricing, not time-of-use pricing. So, simple: Time-of-use, bad; realtime pricing, good. So, the reason is is that time of use pricing is just two fixed prices that do not vary with system conditions, whereas realtime pricing is what you pay for every product that you consume. In other words, you know, air travel is realtime pricing. What they do is they look to see what the current state of demand is, and the airline figures out what price should we charge for a flight today or even for a flight two weeks from

now. So, they are always gauging, you know, current market conditions to set prices, just as essentially every other product.

So, the nice thing is realtime pricing provides this incentive for loads to become megawatt suppliers, suppliers of negative production or essentially reducing their demand. Sorry. Time-of-use essentially just has the same incentives as a fixed-price retail contract, because it just says, "Look, no matter what the temperature is, no matter what the state of demand is, you are paying a higher price in peak periods versus off-peak periods." I mean, that is good to get people to want to make investments to shift where they consume most of their power, but what we want is flexibility of getting people to go away when we need them to go away, because there is many days where you just do not need people to go away, you can meet demand, but there are many other days where you do.

So, the big technological barrier here is the fact of interval metering, you know, if I cannot measure it, I cannot sell it, and so I need metering that can meter electricity on an hourly basis; otherwise, all I can do right now is essentially read your meter at the beginning of the month, read your meter at the end of the month, and the total amount that you consume in the

month is all I know. I do not know if you consumed caviar, if you consumed hamburger. All I know is you consumed this many megawatts of electricity.

If you have an interval meter, the opportunity is for both retail competition, we can differentiate our products as retailers using essentially up to 744 dimensions, the total number of hours in the month. In terms of how we want to compete with retail competition with an interval meter, we are competing on one single price. No surprise that it is very hard to get much retail competition if that is all people can compete on.

The other is is cost really is not a barrier to getting interval metering in place. I mean, maybe you could make the argument before, but certainly now it is almost a sort of -- the cost savings from getting rid of the manual meter readers comes very close to paying for the price of interval metering technology. The other is is that we have ways to communicate in realtime with customers. Almost I am sure everyone here has internet access at home and certainly could be able to see what the price signals are, or you could just go outside and see it is a really hot day, and that will pretty much clue you in as well.

So, the idea is that -- the good news is is that it seems, at least in California, there is some movement

towards getting these meters in place. In particular, PG&E is installing interval meters for all of its residential customers. San Diego is sort of a little bit behind them, and Southern California Edison realizes the implications of this and is slowing the process as much as possible, because then consumers can see how much it is actually costing them to consume in each hour.

So, what has to happen in order to sort of make everything go is we have got to make the default price that all customers pay is the hourly realtime price. The point here is no one actually pays that, just as I am sure no one here who travels actually shows up at the gate and buys their ticket. That would be the analog to essentially paying, but that option is what causes you to call up and book in advance. It is the same sort of thing with electricity. You are going to have to essentially call up and book in advance to essentially get the hedge that you need, and what state regulators can do is essentially help people to make this transition to actually hedging the risk associated with the realtime price.

So, the idea here is this is really what makes the whole market work, is that if we have got customers exposed to realtime price risk, they will want to hedge

that risk. What they will do is hedge that risk through agreements with retailers. Those agreements with retailers give retailers the incentive to sign the forward contracts that we actually want to have signed, and then those forward contracts will be what will enable the generators to actually get paid and build their power plants.

So, what the real issue is is that is the key to getting this to move, and the other problem is is that it is to define what I've called the sort of expected price, expected variance price frontier. So, think of it as what we have is consumer preferences are essentially I like prices with lower variability, and I like lower average prices, so that is why the arrow points at directing of increasing preferences, I would like zero risk and a zero price.

So, we can think of as indifference curves saying I would trade off a little bit more risk for a little bit lower price, and that is why the indifference curves like the way they do, the U0 and the U1, and then what happens is we hope what will happen in the market is there will be this sort of frontier of expected feasible price risk and expected prices that the market can offer to retail customers, and what retail customers do is they select, based upon sort of their preferences

for risk versus expected price, where they would like to be.

So, for example, I have drawn customer zero is the one that essentially is willing to take on a little bit more risk to get a little bit lower price, whereas customer one is willing to take on a bit higher price in exchange for getting a lower average price -- excuse me, variability price.

So, what happens in the world now, we have this free default price that is zero risk, that is insured by the regulator and the government, is the following, is that we slap on top of this this default price, which is the vertical line with the dots that says, "Okay, we, the state regulator, we understand what the right default price is." It is this one with the vertical dotted line, default price, expected price retail, D.

What happens is is that everybody, as you can see, gets a higher level of utility from the fact that, yes, I now -- you know, choice consumer one, he was willing to take a little price risk, but you completely eliminated his price risk and gave him just a slightly higher price, so he likes it, and the other consumer, he said, "Great, I don't like risk, you are giving me now zero risk and a lower price, boy, I love that," and both of them go to the corner solution.

But the point is is that this is essentially an unsustainable position in that what happens is is with this default price, everyone leaves, but that default price was built on the assumption that everyone was in there, and all that risk was being managed by a single price, and so this is what gets the problems with the -- the unhappiness that people have with retail prices in comparison to the regulated regime.

So, the right default price is to essentially say, "Look, if you want a zero risk default price --" and this gets to the point that Jim was making in his talk, is that most likely the reason why the zero risk default price is so high in coming out of these auctions is because of the fact that it really does represent an enormous risk to provide; in other words, that what the market can provide is this feasible frontier, and so the fact is you are going to need to really mitigate a lot of risk to be able to do that, and therefore, need to charge a pretty high risk premium.

So, the big barrier to this symmetric treatment that we need to have happen is the fact that everybody points the finger when you try to assign price/risk management to them. So, the interesting thing in California is we had interval meters on large customers, above 200 KW, that were paid by California taxpayers by

the summer of 2002. We do not have a tariff that essentially puts these customers on the realtime price. They still have a default price that is the fixed rate, and the simple way that happens is is that they say," Well, you are going to put all the burden on us. What about those residential customers to manage that risk?"

So, the other problem with this realtime pricing is more political, the fact of you are charging a high price exactly when the consumer needs the electricity the most, and so this is sort of where economists sort of leave the realm and behavioral economists come in or psychologists come in, but it is sort of how do we make this -- I mean, to an economist, the fact that you charge a high price when the customer really needs it is kind of, "Yeah, that is the way it works. High demand, high price, typically." But now the question is is how can we make this more politically palatable?

One of the things that has arisen in California is critical peak pricing, where what happens is is that you have these so-called critical peak days, and instead of charging customers a higher price on those days, you actually give them a rebate for their reductions in demand relative to some baseline level.

So, I just wanted in the time remaining just to quickly discuss this experiment that we did to try to

assess this, and the one thing that I want to say is, for those of you who live in the D.C. area, you will be being solicited by your local utility for a similar type of experiment. Please accept the experiment, because we don't want to lose people to attrition and therefore bias the results. So, be good citizens and sign up and do it. And you'll get money, too.

So, the idea is that starting in the summer of 2005, the City of Anaheim ran this experiment where what they said is all customers are going to pay according to the sort of standard baseline cheap rate; past the monthly baseline of 240 KW, you pay at a higher level. Then what happens is is that customers in the control group, that is all they pay; customers in the treatment group, what they are going to do is they are going to receive a notification that says, "Look, tomorrow's a CCP day, a critical peak day. If you reduce your consumption relative to your reference level, we are going to pay you 35 cents per kilowatt that you reduce relative to that reference level."

The nice thing here that makes this the customers love it, in particular in the many focus groups that were done, everybody says, "I love the rebate mechanism, I hate that high price mechanism that charges me a high price on those hot days," and so, you

know, it is because of the fact that you can't lose. If you do not make effort, you do not get any rebate, but you just pay at your normal sorts of price, and that seems to really have interesting implications from an economist, because, if you like, there is an equivalent marginal price that you can charge someone that makes sort of people exactly the same, but somehow it seems that people prefer this.

The one thing that I can say from the analysis -- so, this just tells you we did an analysis, and I won't -- I will skip all the sort of discussion, but what this "coefficient treat times CCP" is is it says, "You are in the treatment group on a CCP day. How much lower or higher is your consumption?" And what you can see is it is roughly about 12 to 14 percent lower during the critical peak periods, is the amount that you get as a reduction as a result of this promise that says, "Look, if it is a critical peak event, you will get paid 35 cents per for reducing relative to your reference level during those periods, noon to 6:00 p.m." So, that is a -- you know, that is a pretty sizeable reduction.

If you could scale that up, just to give an example, to entire California, and roughly 35 percent, 30 percent of California load, you could get, you know,

roughly, you know, on the order of 4 percent of load to go away. That is a pretty significant amount of power plants that you do not have to build.

The other is is that the -- we also looked at the impact of this so-called treatment effect on the days as a function of temperature, and what you can see is that it turned out, at least for this experiment, is that, you know, on higher temperature days, in fact, people were willing and reduced more than they did on lower temperature days. So, for example, on a very, very hot day, you got about an 18 percent reduction; on a less hot day, maybe around a 12 percent reduction.

So, the other is the issue that we looked at is just does this power go anywhere? In other words, is this just power that people just decide not to consume, or is it the fact that they try to consume stuff in neighboring days heading up to a CCP event, because you are notified a day ahead. So, what you might do is you know tomorrow is going to be a CCP day, so you go out and you clean your pool, you heat or cool down your house, you do other sorts of things like that, and so maybe we should see something a day before, a day after. This table essentially says, no, we really don't. Where "CCPT minus one" is essentially saying the day before a CCP day, we see no change in their consumption either in

the peak period or off-peak period. So, this really just looks like energy that they just reduce and decide not to consume.

So, the final issue is just that, okay, if we have these sorts of mechanisms in place, there is an additional source of benefits that we can get from customers being price-responsive. So, for example, the large retailer that has some significant amount of customers that are willing to take on this price risk, what that retailer can do is they can use those customers strategically.

So, for example, just to give a little simple model, is we say, okay, the PRTP is the price that I might send to customers facing a realtime price signal, and P wholesale is the actual purchase price for that hour. What I could do is I could say to my customers that are taking on realtime price risk, is say, "Look, I promise you will pay no more than I actually pay to supply you with the electricity that you consume in the month." That is what that equation of sum PRTPTQT equals PWTQT is, but what I am going to do is I am going to use you to essentially reduce the amount that I have to pay to serve the customers that are on fixed-price contracts.

How this works is that what I do is during the

periods when the wholesale price is likely to be very high, I essentially say to my RTP customers, "Please go away this time." So, what happens is I reduce the amount that I have to actually buy out of the wholesale market, and that is that big yellow area, is the amount that I save, because I work off that supply curve to reduce the amount that I have to buy.

Then what happens is, is because the promise that I made to you that, look, I am not going to make any profits off of you in terms of your willingness to be price-responsive, during the low demand periods, what I do is I cut the price to you and I say, "Look, it is a particularly good time for you as the realtime pricing customer to consume a whole lot," and that pulls out the demand during those periods. True, it increases the price that I have to pay to serve my fixed-price customers just a little bit by, say, PM, but as you can see, that little yellow area is the cost, the big yellow area is the savings. I, as the retailer, make lots of money, and I could even say to you, "Look, I will even share with you, as my price-responsive customer, some of the savings that I get from serving my fixed-price customers." So, in other words, we now have essentially, you know, a standard thing of a buyer exercising its ability to move the price and to

essentially save money for its customers, which is how it works in every other market.

So, the basic point that I just would leave you with is, I do not think if we really want to take seriously restructuring, we want to make it work, the bottom line is is that demand has got to get involved, and because the big source of benefits is I think this more efficient capacity utilization, and this is just the standard picture to show it, is to say, "Look, under the regulated regime, we set P-regulation, and we built enough capacity to meet demand, that K-reg."

Under competition, we have the ability to essentially let prices allocate a fixed capacity, so we could have K-comp, which is significantly less than K-reg, and, therefore, get by with less capacity, have to pay less money to generators to be there, because in both instances, you have got to pay for the capacity if there or it goes away, and the advantage here is this is no different from what exactly happens, for example, in the airline industry, is what's happening as a result of restructuring, to lower average per passenger mile, is the fact that we have reduced load factors, and that is not fun, because now somebody sits in that middle seat, but that is why you get the cheap average ticket, and that is why essentially it works, because we have got an

active demand-side that is treated symmetrically.

So, thanks very much, and I will stop.

MR. NEWSOME: Thank you, Frank. Any quick questions for Frank?

AUDIENCE MEMBER: Just real quickly. Frank, is it possible in your opinion to exercise monopsony power absent realtime pricing and realtime metering?

MR. WOLAK: Yeah, I mean, it is a great question, but I know it because I fed it to you. No, no, I am just joking.

AUDIENCE MEMBER: I was accused this past summer of getting ready to exercise monopsony power.

MR. WOLAK: No, no, no. I mean, this was a point that was raised a lot in California, is that they would say that the State of California is a single large buyer, so it is exercised monopsony power against the generators. Remember, the key issue that made my whole diagram work, right, was the fact that I can get demand to go away. So, I have to be able to withhold to be able to exercise monopsony power.

If I am the State of California buying an inelastic demand versus 9 million people buying an inelastic demand, I can't exercise monopsony power as the large buyer. The suppliers go, "Hey, we know how much demand is. Sorry, you are going to pay that price,

because we know how much demand is." So, its key is the ability to withhold output. Similarly, the key to exercise unilateral power on the supply-side is the ability to withhold output. So, it is symmetric in that sense.

MR. NEWSOME: Is there any indication that the very small residential customers are not really interested in participating because of the administrative cost of looking at their meter and paying attention to their emails?

MR. WOLAK: Well, but I guess what I would say is, remember, no one likes to make effort. I mean, but the point is is that I guess I would argue that is not a choice. I mean, with the decision to go to a restructured market, I guess what I had -- and one of the things I've argued many times during the whole restructuring process is, think airlines. Before it was show up at the gate, spend your money, and you get on the flight, and it is the same price. Why? Because the CAB makes it the same price everywhere. The reason that it works in airlines is the same reason it can work in electricity, because we have got smart customers making an effort, managing this price risk.

In other words, the other way I like to always say it, which really gets people upset, but effectively,

if no one changes their behavior between a regulated regime and a market regime, the market regime is guaranteed to be higher cost to customers than a regulated regime. The simplest answer is, in markets, we pay market clearing prices, and in regulated regime, we pay only costs, and we only reimburse for costs. So, if everybody is doing exactly the same thing, I don't see how it can't be true.

So, what we have to have is smarter customers essentially managing this risk, taking the decisions, and resulting in more efficient capacity utilization.

MR. NEWSOME: Thank you. Any other questions? Jim?

JIM: This may be another version of the same question, but it seems like Alcoa has a lot of elasticity in demand. They can -- and they have a lot of incentive to have somebody looking at the internet all the time figuring out what the prices are, but if I am sitting -- if you are talking about realtime price changes, I cannot sit at work and look at the internet all the time hour by hour, because then I don't have a job and I cannot pay my electricity bill.

MR. WOLAK: Two responses to that: First is, yeah, I hope you have better things to do. The other is is that we have these things called computers, and they

are very good as sort of figuring out and responding automatically to things, and so one of the big things is just simply people can essentially program certain things into what they do.

The other is is that fundamentally, like this critical peak day, I mean, it is roughly 12 days of summer, and so, in other words, what we are talking -- the good news is is particularly load duration curves are extremely peaky, so it is only going to be a few days, but I guess what I would argue is that, you know, that will get us a whole lot, and I do not think that will ruin your life that much, but I think the fact that what we have to do is we have to get rid of that free hedge, because if we do not get rid of the free hedge, no one is ever going to make the investment to manage the risk, and if no one ever makes the investment to manage the risk, we never sort of get to the promised land, so to speak.

So, if the world is one where you say, "Gee, I do not really want to think about this, I do not want to do this," then I guess my advice is, don't restructure, because it is not going to work if you do not.

JIM: That is why -- the problem I have with the experiment is if the real world is a few days and I get notice of those few days, then the experiment does

require the real world experience. If it is an hour-by-hour change that I have to worry about, the Alcoas of the world can deal with the hour-by-hour change. The retail customers, the residential retail customers, can't. I mean, we can deal with a day, you know, if I get a notice in advance of the day, I can deal with that.

MR. WOLAK: Yeah, I think consumers are much smarter than that, but I mean, you know, it is sort of -- I think what will happen is consumers -- if you did say the default was realtime, people can buy out. They can buy out of it. So, the whole idea is -- but unless you make it the -- you say the default is the realtime, no one is going to buy out.

It is like my little graph shows, everybody's going to go to the one where the Government says, "Look, you get a zero risk, fixed price," even though there is that curve out there that people would lie along, but the problem is everybody is going to say, "Great, the Government's insuring that I get a zero risk price," and the thing is is that could happen in the old vertically integrated regime, but in the wholesale market regime, unless you want to do what we did in California, which is backstop the fixed price retail price with taxpayer dollars, that is not a viable option. But the thing is

is that, you know, in the end, you still pay, because you are a California taxpayer, too.

But the bottom line is we have got to give people the incentive to manage this risk, and the typical way we do it in every other market is we say, "Look, you pay the default price as the same price that the supplier receives, and if you want to get out of it, you have got to find somebody to essentially manage that risk for you or you have got to manage that risk, but you have to pay for the fact that you are getting risk management services," and therein I think lies the whole benefit of retailing, is that, you know, for example, I would expect if everybody has interval meters, you will have guys that say, "Well, gee, I go to the beach on the weekends. I want a weekend rate for my house in D.C." So, what happens is, you know, I pay a really high price on the weekends for a really low price during the week. Why? I am never there on the weekends.

So, I think that that is -- but none of this goes unless we are going to say, "Look, you are thrown --" and, you know, I hate to say it, but "you are thrown to the wolves, and that is the default price you pay," and, you know, the way we have to manage it is to say, "Okay, for all the people that are kind of the slow children, so to speak, we are go to help you along to

give you sort of recommendations as to what you need to do."

JIM: The problem is the experiment does not seem to take that into account.

MR. WOLAK: Yeah, but that is what all experiments do, but you can -- using this data, you can estimate a model of consumer demand, which is precisely what I have done in other work, then you can say, "Okay, I have got this customer's utility, his preferences, I can then put him in any environment and I can do what I want with him," but, you know -- and so that is effectively what you could do.

But the experiment is only just to say, "What is the response that you get for the population of customers in the Anaheim service territory if you put everyone on this CCP rate that exists?" And the trick is is that, you know, we are getting a methodological discussion in economics, but that is what the experiment allows you to conclude, and I will completely agree with you, but the point is is that what economists like to do, particularly me, is you can estimate models of people's consumption, and so what you can do is you can say, "Look, you know, I am a forward-looking consumer, I face this dynamic crises, and how do I decide to respond?" And, you know, you would say, rationally, the

guy is going to ignore lots of little prices and he's going to worry about the big days where it is really worthwhile to take action, I think that is what you will see.

So, sorry for a long answer.

MR. NEWSOME: Any other questions? Okay, I am going to ask the last one, and then we will wrap it up.

Maureen, if your neighbor came and asked you, What is the one thing that I can do to save on my energy costs and, you know, absent putting in a new heating and cooling system," what would you tell them?

MS. MCNAMARA: Well, I would tell them that light -- you know, Energy Star-qualifying light bulbs are good. I would suggest that they look at sealing up their home and their ducts to make sure there aren't any big gaps in their ducts, and I guess that would be probably the quickest, most cost-effective way, and I guess, you know, when it comes time to purchase, to look for the Energy Star logo.

MR. NEWSOME: All right. Well, thank you. Thank you, panel, and thanks, everybody.

John, do you want to --

(Applause.)

MR. SEESEL: I just want to say thank you to Hampton and a great panel this afternoon, and I hope

people will be able to join us tomorrow morning at 9:00 for two panels, one on the sort of global energy supply situation and the implications for the U.S., and the second panel is on whether we are more vulnerable now to energy supply and demand shocks than we have been in the past. The program will start, as I said, at 9:00, and the doors will open at 8:00 tomorrow morning.

Thank you.

(Whereupon, at 5:20 p.m., the hearing was adjourned.)

C E R T I F I C A T I O N O F R E P O R T E R

DOCKET/FILE NUMBER: P072114

CASE TITLE: ENERGY MARKETS IN THE 21ST CENTURY

DATE: APRIL 11, 2007

I HEREBY CERTIFY that the transcript contained herein is a full and accurate transcript of the notes taken by me at the hearing on the above cause before the FEDERAL TRADE COMMISSION to the best of my knowledge and belief.

DATED: 5/1/2007

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SALLY JO BOWLING SUSANNE BERGLING

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I HEREBY CERTIFY that I proofread the transcript for accuracy in spelling, hyphenation, punctuation and format.

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