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POWERING AMERICA: EXAMINING THE ROLE OF

FINANCIAL TRADING IN THE ELECTRICITY MARKETS

WEDNESDAY, NOVEMBER 29, 2017

House of Representatives

Subcommittee on Energy

Committee on Energy and Commerce

Washington, D.C.

The subcommittee met, pursuant to call, at 10:15 a.m., in Room 2322 Rayburn House Office Building, Hon. Fred Upton [chairman of the subcommittee] presiding.

Members present: Representatives Upton, Olson, Barton, Murphy, Latta, Harper, McKinley, Griffith, Johnson, Flores, Mullin, Hudson, Walberg, Rush, McNerney, Peters, Green, Sarbanes, Welch, Tonko, Loebsack, and Schrader.

Staff present: Samantha Bopp, Staff Assistant; Allie Bury, Legislative Clerk, Energy/Environment; Zachary Dareshori, Staff Assistant; Wyatt Ellertson, Research Associate,

Energy/Environment; Jordan Haverly, Policy Coordinator, Environment; A.T. Johnston, Senior Policy Advisor, Energy; Mary Martin, Deputy Chief Counsel, Energy & Environment; Alex Miller, Video Production Aide and Press Assistant; Brandon Mooney, Deputy Chief Energy Advisor; Mark Ratner, Policy Coordinator; Annelise Rickert, Counsel, Energy; Dan Schneider, Press Secretary; Peter Spencer, Professional Staff Member, Energy; Jason Stanek, Senior Counsel, Energy; Rick Kessler, Minority Senior Advisor and Staff Director, Energy and Environment; John Marshall, Minority Policy Coordinator; and Alexander Ratner, Minority Policy Analyst.

Mr. Upton. Good morning, everybody. So at our last Powering America hearing we examined the important role that consumer advocates play in the organized electricity markets. Today, our examination of these markets continues as we turn our attention to the role of financial market participants, both why trade financial products and the effects that their transactions have in the nation's seven RTO and ISO markets. With us today are witnesses who have extensive experience in trading financial products on behalf of private institutions and a major utility. We also have a rep from PJM Interconnection, the world's largest wholesale electricity market and the market monitor for the California independent system operation, so welcome.

Financial market participants are playing an increasingly visible role in the organized wholesale electricity markets. It is claimed that financial transactions can improve the efficiency of the physical electricity markets by providing increased liquidity, mitigating market power, and improving price formation.

In this hearing, I hope that the witnesses will explain their perspectives regarding why we have financial trading in the organized electricity markets and how this trading affects consumers who ultimately pay for electricity services.

Each of the RTOs and ISOs allow financial trading to occur in their markets including PJM and the California ISO. The most commonly traded financial products are known as financial

transmission rights or FTRs and virtual transactions. While these products can by used by traditional utilities to hedge themselves against volatile price fluctuations, these products are also bought and sold by financial traders such as banks, investors, and other speculators.

While financial market participants ultimately trade to make a profit, for sure, advocates for trading claim that financial transactions strengthen the markets by increasing trading volume and liquidity which in turn reduces volatility and risk. Financial traders also claim to provide for the needs of physical market participants by offering services such as customized hedges and various types of options to limit the risk.

However, measuring the overall contribution and benefits of financial transactions in the electricity markets are certainly difficult. Critics of financial trading argue that both FTRs and virtual transactions extract value from the market without providing equivalent benefits in return. I also understand the FERC is currently reviewing several hotly debated proposals which would reduce the opportunities for virtual transactions to be used to profit from the market without adding commensurate value.

Not surprisingly, many financial traders are opposed to those proposals and as our Powering America series extends into next year, we will continue to tackle some of the most complex and challenging issues concerning both electricity markets and the energy industry. Along those lines today, our job is to take

a hard look at whether FTR and virtual trading market makes sense and answer the question, does financial trading make the electricity markets more efficient and in turn result in benefits to consumers?

So with that I yield to the ranking member of the subcommittee, my friend from Illinois, Mr. Rush.

[The prepared statement of Mr. Upton follows:]

**********INSERT 1**********

Mr. Rush. Well, thank you, Mr. Chairman. And Mr. Chairman, I want to applaud you for holding this important hearing today.

While we have an opportunity to examine the witnesses before us, we will be looking at the role of financial trading within the electricity markets. Mr. Chairman, while this may appear to be an obscure topic that the American people and even members of the subcommittee may not be intimately familiar with, it is important to keep in mind that these financial trading tools directly impact the cost that consumers pay for their electricity.

In reviewing the testimony for today's hearing, Mr. Chairman, there seems to be unanimous agreement that financial tools such as FTRs as well as day-ahead forward and real-time spot markets play key roles in improving the efficiency of the physical electricity market by providing increased liquidity, mitigating market power, and decreasing price volatility, all of which ultimately benefit America's consumers.

Additionally, Mr. Chairman, it has been noted that the FTRs provide forward pricing that helps gauge the need for additional infrastructure investment so that unnecessary construction and the subsequent costs associated with overbuilding are not passed on to the consumers. However, Mr. Chairman, while all of our witnesses agree that these financial trading tools are indeed necessary, there also seems to be a consensus that some modifications may in fact be needed in order to ensure that these markets are operating in a way that is transparent, that is open,

that is fair, and that is competitive. The discrepancy within the testimonies center around what reforms might be needed in order to adequately achieve these objectives.

Specifically, Mr. Chairman, I look forward to hearing the panelists on two pending reform proposals forwarded by PJM that FERC is currently considering regarding the up-to Congestion or UTC transactions and how FERC's decision will impact consumers. Additionally, I am interested to hear from our panelists on the recent DOE notice of proposed rulemaking and whether they support or oppose FERC providing additional subsidies to some form of generation, coal or nuclear, over and above other resources.

Finally, Mr. Chairman, it can be no surprise that for me the most important factor in deciding whether any reforms are needed, with the panel, how they might impact consumers. I look forward to engaging our witnesses or their ideas for ensuring that RTOs and ISOs are first and foremost responsive to the needs of the customers.

Additionally, I want to make sure that FERC has the tools, expertise, willingness, and authority to administer these financial markets in a way that would be fair, transparent, open, and competitive so that consumer interests are in fact the guiding principles and the most important priorities of the RTOs and the Commission. Mr. Chairman, I look forward to this hearing.

Mr. Upton. Thank you my friend.

It is my understanding that two other subcommittees are

meeting at this same time, so Chairman Walden is going put his statement into the record. Are there any members on our side that would like to use part of his 5 minutes?

Seeing none, is there anyone on your side that needs Mr. Pallone's time?

Mr. Rush. Ranking Member Pallone is also at another hearing.

Mr. Upton. So we will allow those opening statements to go in.

[The information follows:]

**********COMMITTEE INSERT 2**********

Mr. Upton. So we will move to the testimony, to our distinguished panelists. We are first joined by Wesley Allen, the CEO of Red Wolf Energy Trading, on behalf of the Financial Marketers Coalition.

Thank you all in advance for submitting your testimony so that we could see it yesterday. And if you would summarize, each of you your testimony, in no more than 5 minutes, at which point we will do questions from the members that are here.

So Mr. Allen, welcome. You are recognized for 5 minutes. Thank you.

STATEMENTS OF WESLEY ALLEN, CEO, RED WOLF ENERGY TRADING, ON BEHALF OF FINANCIAL MARKETERS COALITION; ERIC HILDEBRANDT, DIRECTOR OF MARKET MONITORING, CALIFORNIA ISO; MAX MINZNER, PARTNER, JENNER & BLOCK LLP; NOHA SIDHOM, CEO, TPC ENERGY, ON BEHALF OF THE POWER TRADING INSTITUTE; VINCE DUANE, SENIOR VICE PRESIDENT AND GENERAL COUNSEL, PJM INTERNCONNECTION; AND, CHRIS MOSER, SENIOR VICE PRESIDENT OF OPERATIONS, NRG ENERGY

STATEMENT OF WESLEY ALLEN

Mr. Allen. Good morning, Chairman Upton, Ranking Member Rush, and members of the subcommittee. Thank you for inviting me to share our opinions of the electricity markets. My name is Wesley Allen. I am CEO of Red Wolf Energy Trading, a small trading firm headquartered in Raleigh, North Carolina. I am representing the Financial Marketers Coalition which is a group of similarly situated companies transacting in the ISO/RTO markets.

Red Wolf is a small company. We employ about a dozen employees scattered around the United States specializing in transacting the ISO/RTO energy markets. First and foremost, we support competitive markets. The transactions that we engage in clear the ISO day-ahead markets and then settle on the real-time. While we have been around for about 10 years, the type of activity we engage in has been around for longer and started when FERC began restructuring the electricity markets in the early 2000s.

The purpose behind restructuring was to add competition and

liquidity, price transparency, and to shift risk from consumers to investors. While the road to the restructuring wasn't always smooth, after almost 20 years I believe it has been a success although there is room for improvement. The trading we do broadly is called virtual trading. Every ISO/RTO in the country allows virtual trading with one exception, the western Energy Imbalance Market.

When the FERC was restructuring the electricity markets they realized without participation by companies like ours many of the goals they were trying to achieve would not be possible. One of the goals of restructuring was breaking up natural monopolies. Financial participation is the engine that drives competition and liquidity in the transparent RTO/ISO markets.

Specifically, we engage in three types of transactions: an increment offer which sells electricity, a decremental bid which buys, and, lastly, a more refined ISO/RTO market such as ERCOT, a point-to-point transaction which is a basis or spread trade that transacts on the congestion between two locations on the transmission grid.

Electricity is uniquely localized, and without participation in these markets generation and load-serving entities could exercise market power. Generation can exercise market power by economically withholding the electricity they supply. They could sell less power in the day-ahead but at a higher price. Think of what OPEC does in the oil markets.

But not all generation withholding is nefarious in nature. Some is risk management. Contracts awarded in day-ahead are financially binding. Some generators may opt not to schedule their full output in case the wind doesn't blow or if they should have an equipment failure. Likewise, load can do something similar by underbidding their load and therefore buying most of their needs at a lower day-ahead price, then purchasing the remainder in the real-time. In these cases, virtual traders such as ourselves are assuming the risk that the utilities are unwilling to take.

The purpose of the day-ahead is to pre-position the markets for the needs the next day. Electricity being a high/low class, it is necessary not only to commit the right amount of generation, but to commit generation in the right location in order to have an efficient and reliable market. Given the natural monopolies to the market power that would otherwise exist, financial participation is critical.

A great deal of time in today's hearing will be spent on the forward markets. While efficient forward markets are critical, so is price formation in day-ahead and real-time energy markets. If prices are incorrect in the day-ahead and real-time, then the wrong signals will be sent to the forward markets. The FERC has been working on price formation for some time now. The conclusions and improvements they have been working towards are going a long way to improve the markets. My only regret is it

is taking a long time.

Our participation in these markets has been under attack. Some have grown weary of competition and long for the former structure. That said, there have been a couple of notable electricity economists that through analyzing market outcomes have put a dollar figure on the efficiency gained by our participation. Dr. Wolak found that our participation in the California ISO increased market efficiency in the first year of virtual trading by $70 million per year. Additionally, Wolak found that by more efficiently committing and dispatching resources, our trading, virtual trading reduced greenhouse gas emissions by somewhere between 650- and 537,000 tons annually. Dr. Patton, the independent market monitor at MISO, found that at a minimum financial market activity added $65 million in increased efficiency. While most recognize that virtual trading adds efficiency in RTO/ISO markets, more could be achieved. Nearly half of all virtual transactions at less refined ISOs are done in a price-insensitive manner. More refined ISOs allow basis tradings, specifically ERCOT. Dr. Patton has been advocating for this product at MISO for over 5 years. With implementation scheduled for several years from now, we believe these critical changes are taking too long.

In conclusion, virtual traders add efficiency to ISO/RTO markets by injecting competition and liquidity that would be absent without them. Thank you and I look forward to your

questions.

[The prepared statement of Mr. Allen follows:]

**********INSERT 3**********

Mr. Upton. Thank you.

Next, we are joined by Eric Hildebrandt, director of Market Monitoring for the California ISO. Welcome.

STATEMENT OF ERIC HILDEBRANDT

Mr. Hildebrandt. Good morning, Congressman. Thank you for inviting me today. My name is Eric Hildebrandt, director of Market Monitoring at the California ISO. The Department of Market Monitoring serves as the independent market monitor for the California ISO. The Federal Energy Regulatory Commission requires each ISO to have an independent market monitor whose mission includes, quote, the protection of consumers and market participants by the identification and reporting of market design flaws and market power abuses.

My testimony today highlights a major market design flaw that exists in all ISOs which is costing transmission ratepayers at least $400 billion per year. This flaw involves the auctioning by ISOs of financial instruments called financial transmission rights or FTRs. California calls these congestion revenue rights or CRRs.

Ratepayers of load-serving entities pay the full cost of the transmission system through transmission access charges and also higher prices when congestion occurs. All congestion revenues collected by ISOs should therefore be allocated back to transmission ratepayers. In fact, FTRs were initially developed as a way to fairly allocate congestion revenues back to the participants who pay for the transmission system. All ISOs currently allocate FTRs to load-serving entities based on

their projected use of the transmission system. We support continued use of FTRs in this way to provide load-serving entities with a hedge that offsets the congestion costs they may incur. However, we believe that all additional congestion revenues that remain after settlement of these allocated FTRs should also be refunded to transmission ratepayers.

Currently, however, after allocating FTRs to load-serving entities, ISOs then auction off additional FTRs. These FTRs are essentially price swaps. But unlike price swaps for other commodities, FTRs are not cleared and settled based on bids from willing buyers and sellers. Instead, ISOs auction off FTRs and then pay off these FTRs using congestion revenues that would otherwise be refunded to transmission ratepayers.

Unfortunately, the revenues collected from the auctioned FTRs consistently are much lower than what ISOs pay out. This makes FTRs highly profitable for financial entities, but these profits directly reduce congestion revenues refunded back to ratepayers. We estimate ISO ratepayers nationwide are losing at least $400 million per year from FTRs sold at auction. Almost all of these profits are going to purely financial entities and trading companies with a very small portion of FTRs purchased as potential hedges against congestion costs.

In California, ratepayers lost over $680 million since 2009 or about $75 million a year through the auction. Ratepayers receive only 52 cents in the auction for each dollar that the ISO

pays out to these FTRs. This represents a profit of nearly a hundred percent for financial entities purchasing these FTRs.

In the PJM Interconnection, data indicated ratepayers have lost at least $1.2 billion in FTR auctions, or about $170 million per year. As a result, PJM's independent market monitor and the Organization of PJM States are calling for changes to PJM's FTR process to ensure all congestion revenues are refunded to ratepayers.

In New York, recent analysis by Stanford University shows that non-load-serving entities received FTR profits of over 900 million since 1999, or about $60 million per year. As explained in a 2014 expose in the New York Times, FTRs were originally designed to help protect electricity producers, utilities, and industries that need to buy power, but, quote, Wall Street banks and other investors have stepped in, siphoning off much of the money.

In the Midwest ISO, ratepayers have received less than 80 percent of day-ahead congestion rent since 2010. This represents a loss of at least a hundred million dollars per year from the FTR auction. If ISOs don't take action to address this issue, the FERC will need to take action to protect the nation's transmission ratepayers.

Thank you again for the opportunity to be here today and I look forward to answering any questions you have on this issue.

[The prepared statement of Mr. Hildebrandt follows:]

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Mr. Upton. Thank you.

Next, we are joined by Max Minzner, partner of Jenner & Block LLP. Welcome.

STATEMENT OF MAX MINZNER

Mr. Minzner. Thank you. Thank you, Chairman Upton, Ranking Member Rush, committee members. I appreciate the opportunity to be here today. My name is Max Minzner. I am a partner at the law firm of Jenner & Block. From 2015 until 2017 I was the general counsel at the Federal Energy Regulatory Commission and from 2009 to 2010 I was Special Counsel and the Director of Office Enforcement at FERC where I helped design and oversee the agency's enforcement program.

I believe that financial transactions play an important role in today's energy markets. However, I think it is worth distinguishing between two types of financial transactions. First, some transactions occur within the RTO and ISO markets. Generally, those financial products take their value from the sales of physical energy and are designed to facilitate the sale of physical energy in some way. Those transactions are generally FERC-regulated.

Second, some transactions in energy derivatives occur outside those markets. For example, trading can occur on ICE or NYMEX. To the extent that those transactions are regulated, the Commodity Futures Trading Commission oversees the markets where they are traded. This division leads to a core question for Congress and for federal regulators: which products should be traded in the markets regulated by FERC and which products should

be traded elsewhere?

To answer this question the Commission should focus on its role as the regulator of transactions in physical energy. In my view, considering the expertise, mandate, and jurisdiction of the Commission, financial products should exist within the FERC markets to the extent that they are helpful to improve the functioning of these physical energy markets. They should not be created or expanded past the point at which they are needed to ensure that the physical markets work efficiently and deliver value to consumers. Right now, the financial products in the FERC markets generally serve this purpose. For example, virtual bids and offers can reduce price risk and improve reliability by aligning the prices in the day-ahead and real-time markets for electricity. Similarly, FTRs allow entities to reduce their exposure to the risk of price variations.

While these products do have real value for consumers, appropriate regulation of their trading by the Commission is important. For example, FERC has correctly worked to ensure that adequate credit requirements exist in the RTO and ISO markets. These requirements mandate that market participants have the financial ability to cover the obligations they assume. FERC also needs to carefully coordinate with other regulators. Given its jurisdiction, the CFTC has a role to play in this area. These two agencies need to work together to ensure coordinated regulatory efforts.

A robust FERC enforcement program is also crucial. Financial products have played a role in many of FERC's recent enforcement actions aimed at market manipulation. In particular, the Commission has often targeted a form of misconduct known as cross-market manipulation. Cross-market manipulation occurs when a market participant takes positions in two different but related markets. For example, a trader might obtain a large financial position in a product that derives its value from a relatively thinly traded physical energy product.

By making large trades in the physical product, the trader might be able to change its price in ways that enhance the value of the financial position. Even if there is a loss on the physical position it can be offset by a much greater gain in the financial position. The Commission needs to make sure it has the analytic and oversight tools necessary to exercise its enforcement authority effectively and thoughtfully.

Finally, the Commission should be open to improving its efforts in this area. These markets change quickly. As a result, the Commission should be frequently assessing the financial products and its markets, its regulatory approach, and its enforcement regime. Thank you again for the opportunity to be here today. I look forward to your questions.

[The prepared statement of Mr. Minzner follows:]

**********INSERT 5**********

Mr. Upton. Thank you.

Next, is it Noha?

Ms. Sidhorn. Noha.

Mr. Upton. Noha -- I am sorry -- Sidhom, CEO of TPC Energy on behalf of the Power Trading Institute. Welcome.

STATEMENT OF NOHA SIDHOM

Ms. Sidhom. Thank you. Good morning, Chairman Upton, Ranking Member Rush, and members of the subcommittee. My name is Noha Sidhom and I am CEO of TPC Energy, a privately funded power trading firm. I am here representing the views of the Power Trading Institute, otherwise known as PTI. PTI represents a diverse group of energy market participants ranging from large load-serving entities, suppliers, marketers, privately held commodity trading firms, as well as funds with investments in the power space.

My comments here today will focus on financial transmission rights known as FTRs. FTRs are essentially the price of congestion from point A to point B on the grid. These congestion contracts reflect the increasing value of transmission as more and more power flows across the lines from power supply resources to the customers consuming electricity. A good analogy is a toll road where the tolls increase during rush hour. As road capacity becomes tighter with more commuters driving to and from work, the price to use that road increases.

The same is true for electricity flow across the power grid. FTRs are purchased in an open and transparent auction that is connected by each RTO/ISO market. Market participants compete by submitting bids for specific megawatt quantity of FTRS on the transmission paths made available in the auction.

From the inception of the organized markets, the Federal Energy Regulatory Commission directed the creation of FTRs as a means to provide open access to the transmission grid. Congress demonstrated its commitment to forward pricing in the Energy Policy Act of 2005 by directing FERC to undertake a rulemaking to implement long-term FTR auctions. And we think Congress was correct and forward-thinking in supporting that framework.

Today, market participants utilize FTRs in a variety of different ways to the benefit of consumers. Load-serving entities who supply electricity to consumers utilize FTRs to hedge the risk of the price of congestion when serving their customers. Generation owners and developers utilize FTRs to hedge their risks to price volatility in the power markets. Financial participants provide liquidity and competition in the FTR market which contributes to maximizing the value of the transmission system, a benefit to load-serving entities. Financial participants also utilize FTRs by including them in portfolios of diverse products to provide competitive risk management and hedging services to load-serving entities, generation owners, and generation developers.

FTRs save consumers money in three key ways. First, they provide an accurate price for the contracts that are allocated to transmission customers representing consumers. We are basically the tool on how to return those dollars back to transmission customers. They provide a price for congestion on

the grid to determine whether or not the cost of congestion is a more appropriate investment than the build-out of additional infrastructure.

So essentially, do we just want to pay for the cost of congestion or do we need to build new infrastructure? That is really important because if we overbuild the system consumers are going to pay for that for decades to come and it is going to cost them billions of dollars.

They provide a price signal to lenders financing infrastructure development and thus reduce the cost of financing. Over the past 2 decades of implementing FTRs as a core component of RTO/ISO markets, certain practices have proven to be successful and should be adopted in every market. Long-term auctions need to be implemented. None of the ISOs are in compliance with Order 681 which mandated auctions that cover at least the 10-year period. Currently, the longest term is 3 years.

Allocation of congestions costs caused by unplanned outages should be allocated to those who caused the costs to be incurred. New York ISO employs this practice and as a result has far fewer unplanned outages. Every other ISO should be encouraged to follow a similar practice. The FTR markets are robust and there is increased liquidity year-over-year. The Commission recently noted that there is zero evidence that a redesign of the FTR markets is warranted. That being said, there are challenges both in the FTR markets and in general that impact

the way the FTR markets function. The key challenges at a high level are lack of transparency and outage scheduling; network model updates that are not consistent or transparent; the price formation efforts at FERC should be expanded and expedited; and the technology utilized by the RTOS and ISOs need significant improvement.

Innovation and competitive prices for consumers are the core of our American economy. The Commission has spent the last 2 decades promoting these markets and the financial products that lie at the core of their creation and these economic concepts have worked to benefit your constituents. The way they think about electricity has fundamentally changed particularly over the last decade. Now we have to go the extra mile by ensuring market design flaws are fixed in short order, maintaining competition by expediting price formation efforts in long-term auctions, and pushing the RTOs and ISOs to take on a much-needed upgrade of their hardware and software systems.

It is our responsibility as industry members to work with you, FERC, and other stakeholders to ensure that these markets remain competitive, liquid, and fair to continue to benefit consumers. We look forward to working on future improvements and thank you for the opportunity to testify here today.

[The prepared statement of Ms. Sidhom follows:]

**********INSERT 6**********

Mr. Upton. Thank you.

Next, Vince Duane, senior VP and general counsel for PJM, welcome.

STATEMENT OF VINCE DUANE

Mr. Duane. Thank you, Chairman, Ranking Member, members of the subcommittee. My name is Vince Duane. I am a senior vice president of PJM, and like my colleague to the right, Dr. Hildebrandt, I work for an organization that administers these markets, we don't participate in them. Indeed, our mission is simply to deliver wholesale electricity at the lowest possible cost to the consumer. And the litmus test for financial trading in these markets is whether it furthers that mission. Quite simply that is the question.

There is two points I would like to bring out to the committee's attention that bear on that question and that are unique to these electricity markets like PJMs. First, our core function is a physical function. We commit generation for sale and purchase and deliver it to the ultimate consumer. We do this with the assistance of financial products that trade alongside physical transactions and that is something that makes us quite unique relative to other commodity markets where primary physical markets are quite separate and distinct from secondary financial and derivative markets.

We are a little bit of a hybrid in our financial markets because we believe that financial products can bring liquidity, they can bring price convergence, and can bring pricing discovery to assist in the operation of the physical market, but that is

the standard. There is no other independent basis for these types of transactions to exist in these FERC-regulated markets unless they meet that standard. There are other places for them to go.

We have in this industry our own secondary financial markets. Mr. Minzner made reference to some of them -- NYMEX, Intercontinental Exchange. There are places to go outside of the FERC-regulated markets if there are other needs for financial traders and hedgers. The second point I would like to make is that these markets are complex. I don't think I need to say that but I will start with that point.

Some of you may have heard the term market design and indeed these FERC-regulated markets are very heavily engineered, very much rule-focused. We use rules, thousands of pages of rules, in fact, that are on file with the FERC in the form of a PJM tariff, and underlying those rules are models and algorithms that do two things generally.

One, we use these things to dispatch and commit generation to meet load to keep the lights on in the system and we do that in a way that sets prices. So when you have prices that are formed at least in part by market design, by rules and algorithms, we have learned a few interesting things over time.

First, price dislocations can and do occur, and if these dislocations are caused by a rule feature or by a modeling difference, no amount of financial trading is going to correct those price dislocations. In fact, it will just simply exploit

and profit that dislocation without bringing the arbitrage value that you would theoretically expect to see.

Revenues in these systems are highly contested between asset owners and consumers. So where trading exploits a price dislocation without bringing any corrective value, essentially it is just siphoning revenues out of that system. It is a hole in the bucket and it is something that needs to be plugged as a hole in the bucket.

So in conclusion, the question is whether financial trading in these FERC wholesale electricity markets bring value. My answer is yes, but with qualification. The important point is you cannot assume the efficiency values that you would normally see in purely financial markets such as those administered by the SEC or the CFTC.

Those values are necessarily going to hold in these unique physical electricity markets. But if they are rationalized and if these trades are incented properly and if they are limited where necessary, they can bring benefits. They do bring benefits and transaction efficiency to the physical generation owner, to the transmission customer, and ultimately to the consumer. Thank you very much.

[The prepared statement of Mr. Duane follows:]

**********INSERT 7**********

Mr. Upton. Thank you.

Last, we are joined by Chris Moser, senior VP of Operations for NRG Energy.

STATEMENT OF CHRIS MOSER

Mr. Moser. Good morning, Chairman Upton, Ranking Member Rush --

Mr. Upton. You have to make sure you hit that button on your mike.

Mr. Moser. Thank you. That is the kind of service PJM provides, right there.

Good morning, Chairman Upton, Ranking Member Rush, members of the subcommittee, and fellow panelists. My name is Chris Moser, senior vice president for Commercial Operations and all operations at NRG Energy. As such, I am responsible for the physical operation of our power plants as well as the purchase and sale of billions of dollars of coal, natural gas, and power each year.

My employer, NRG, is one of the largest owners and operators of power plants in the United States. Our portfolio includes conventional plants such as coal, nuclear, natural gas and oil, as well as a large renewable fleet of wind and solar generation. NRG also operates a retail business that serves approximately three million retail customers largely in Texas, but also in the eastern states that allow retail electric choice. As such, we come at this from both the merchant generation side and from the retail providing side.

As a purely competitive company with no captive ratepayers

we earn what we make in the markets that we participate in. As such, we believe that fair and robust competition in the electric sector is the best means of delivering value to consumers. But that comes with risk, and management of financial and operational risk is critical to the competitive markets and those participants in the markets.

NRG relies on a wide variety of tools to manage those risks to remain competitive and to reduce the delivered cost of power to consumers. Included in this tool chest are a wide array of financial products traded within organized energy markets, traded bilaterally between market participants, and through centrally cleared exchanges. NRG uses FTRs and virtual transactions every day to hedge and deliver affordable power to consumers.

On the retail side, NRG uses FTRs to hedge against congestion charges on the transmission system which allows us to sell power to end use customers at predictable prices. By allowing us to protect against unforeseen congestion costs on the transmission system, we are able to offer customers affordable, fixed-price power offerings. Without these products, our company and others would have to charge higher prices to manage that increased risk, that risk premium. That cost would end up being included in retail sales which directly increases consumer costs.

On the wholesale side, NRG likewise utilizes financial products for price discovery and to ensure that our large central station generation receive a predictable price for the power that

they produce. This includes selling power on a forward basis which allows NRG to lock in prices. It also includes purchasing FTRs to perfect those hedges and utilizing virtual transactions to move power sales from day-ahead market to the real-time market or vice versa. These tools are critical to the profitable operation of our power plants and to the overall stability of the wholesale competitive markets for electricity.

In conclusion, financial bilaterals, FTRs, and virtual transactions all play a critical role in the production and delivery of affordable power to consumers. I thank you for the opportunity to appear before the subcommittee and I am happy to help with any questions.

[The prepared statement of Mr. Moser follows:]

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Mr. Upton. Well, thank you. Thank you all. We will now go to questions from the members, I guess.

The first question I have, Mr. Allen, you indicated in your testimony that I believe you said the western alliance did not participate in virtual traders; is that right?

Mr. Allen. Yes.

Mr. Upton. So which states are in that western alliance?

Mr. Allen. It is the western Energy Imbalance Market, so it includes Utah and Nevada, parts of Colorado. It is dispatched as a part of the California Independent System Operator, but convergence bidding -- that is what they call virtuals in California -- is only allowed in the California ISO proper. So most of California and a little sliver of Nevada is the only place where virtuals are allowed to --

Mr. Upton. So by not having that would you say that those folks in those states then pay, the consumers, themselves, likely pay a higher utility cost, higher electric cost?

Mr. Allen. Higher than they would otherwise with the competition and the liquidity that virtuals add. Yes, sir.

Mr. Upton. Let's see. Ms. Sidhom, in your testimony you explained that financial markets participants increase competition and efficiencies in the electricity markets. Can you explicitly state how the trading of those FTR instruments makes the markets more efficient?

Ms. Sidhom. Absolutely. So essentially what is happening

here is, you know, Dr. Hildebrandt explained these transactions as a price swap and that is exactly what they are. FTRs are a price swap. It is a fixed for floating. So the load-serving entity gets the fixed and a financial entity will take on that floating risk. So they are basically shifting risk away from consumers and onto companies like mine that are willing to take on that risk and can manage that risk and offer hedging services.

So when you have all this competition in the market and market participants that are willing to bid in an open and transparent auction so you can go into any RTO/ISO website and see who got the contract in the auction and the price they got the contract, there are also multiple rounds systems of these auctions so there is multiple opportunities for load-serving entities to have some price discovery, as Mr. Moser was saying, to then offload some of their risk in multiple rounds.

So essentially what we do is we go in and we provide liquidity and price competition to benefit the consumer and shift that risk of the volatile market away from them.

Mr. Upton. You also said in your testimony that they needed to have an upgrade on the hardware and software.

Ms. Sidhom. Yes.

Mr. Upton. So I mean, where are they in that process?

Ms. Sidhom. That is an excellent question.

Mr. Upton. Do they understand the problem? I mean do they --

Ms. Sidhom. We don't have a really good answer to that question because there is not a lot of transparency as to what software and hardware upgrades have been made. We know DOE had a $3 million grant that they gave to the Midwest ISO to improve their day-ahead solve time so essentially so that when generators get committed in day-ahead they have some time to procure the gas. It is a gas-electric coordination initiative.

We really don't know where those funds went, what the upgrades were like, what upgrades are necessary. It is kind of all a big black box to us. But what I can tell you is that several of the RTOs and ISOs have had a hard time solving their auctions and that is an issue for us because that is a risk. They may not solve the auction until the settlement period so you essentially have positions on that you don't know what your profits and losses are.

So that is a big concern. Financial institutions in this country are utilizing great technology and they are processing far more information than the RTOs and ISOs are and so is our intelligence community. So we would really like more transparency into what upgrades are necessary and a plan just like any private company would plan, okay, over the next 3 years, here is how we are going to spend dollars on making technology upgrades.

Mr. Upton. Thank you.

Mr. Minzner, so as you talked particularly in your formal role at FERC, have you found that the CFTC and FERC have worked

pretty well together as it relates to the transactions in terms of their oversight role? Are there real squabbles? Are there things that we need to know about?

Mr. Minzner. I think now their relationship is quite good and the agencies have begun to work well together and have been effectively able to coordinate their enforcement programs. I think the relationship has waxed and waned. You may be familiar with a case several years ago where the agencies ended up litigating against each other in the D.C. Circuit over the scope of enforcement authority.

I don't think anybody would view that as a desirable outcome, but I do think as the leadership of the agencies have worked together, tried to build the relationship, and tried to build relationships at the staff level, many of those issues have passed and I do think now the relationship is much stronger and much more effective.

Mr. Upton. Thank you.

Mr. Rush?

Mr. Rush. Again I want to thank you, Mr. Chairman.

Ms. Sidhom, am I pronouncing it right?

Ms. Sidhom. Yes.

Mr. Rush. Do you believe that FERC currently administers the financial trading market in a truly open, transparent, and competitive way that best serves the interests of consumers, and if reforms are needed do you believe that they could be

accomplished best administratively through a commission or is congressional action needed?

Ms. Sidhom. I don't believe congressional action is needed. I think you guys already took the appropriate action in EPAct 2005 promoting long-term auctions. I think that FERC just needs to actually push the ISOs to go in that direction and again push them on the technology initiative. The Commission recently looked at PJM's market design for FTRs and they basically said this is working for consumers. It is saving them money. It is providing the necessary competition. The FERC was very clear there is no redesign warranted. It is very important for these transactions to actually occur within the RTO/ISO paradigm because the RTOs and ISOs are the only ones that can model the constraints.

They can say, okay, we have a transmission line that is coming online in 3 years from now. We have a unit that is retiring here. We can reconfigure the right. So we used to have load from A to B. That is where the load concentration was. Now we have it from A to C, so we are going to reconfigure the path where we need to price that congestion. They are really the only ones capable of doing that so it is so important for them to remain as part of the paradigm and FERC agrees. They don't agree with us often, so I think it is great that they recently agreed with us.

Mr. Rush. Mr. Allen, in your written testimony you say my concerns from a previous hearing regarding the potential for RTOs

to shut out public interest and participation and you said, and this concern should extend beyond consumers to encompass all minority interests in the ISO/RTO stakeholder process, including financial market participants.

How would PJMs propose reforms that FERC is currently considering regarding the up-to congestion impact in this process and, more specifically, what effect would these reforms have on consumers?

And Mr. Duane, would you also chime in on that question?

Mr. Allen. Thank you, Ranking Member Rush. I think the UTC case that came out of the PJM stakeholder process is a perfect example of the minority interest that is not being protected. If you look at the way the voting structure is in PJM for the stakeholder process there is five different categories of voting -- generation owners, transmission owners, load-serving entities, and financial market participants are one of those as well. Most of the PJM membership it is lumped into what they call the other supplier sector which is the sector financial market participants are lumped into. And just so you know, if an IPP or an independent power producer is building a power plant, until that power plant goes online they are lumped into the other supplier sector. So like I was saying, most of the membership is there. And if you look at how the voting occurred in the PJM stakeholder process you had basically the utilities voting in one way and then everybody else voting in a different way, but it

passes because the utilities, you know, have a large share of market power in the stakeholder process.

So I do think reforms are necessary. And, really, when I think about a stakeholder process I wonder, you know, I can understand having a stakeholder process to determine smaller issue things, but when it comes to market design and features, I think, you know, a lot of that regulation should not be coming from the utilities or from stakeholders. It should be coming from the FERC or from Congress, someone other than -- it is analogous to the inmates running the asylum.

Mr. Rush. Mr. Duane?

Mr. Duane. Thank you, Mr. Rush. And I see we have limited time so I will try and be very brief here. There is a lot to say, but I will just refer you back to the fundamental test at least in our belief is that financial trading has to benefit the physical participants and the system as a whole including the consumers and the generators, transmission customers. So our stakeholder process overwhelmingly voted in favor of these reforms and that covers both load interests and supply interests.

Ultimately, at the end of the day the question of whether these transactions bring that kind of value that I am describing will have to be resolved by the FERC and that is why they are there, to address those types of controversies.

Mr. Rush. Thank you. I yield back.

Mr. Upton. Mr. Olson?

Mr. Olson. I thank the chair and welcome to our six witnesses, the special Texas howdy for Chris Moser. I can see NRG's biggest power plant, the Paris Power Plant in Thompson, Texas, from my house. That plant generates 36,000 megawatts of power. Four Powder Basin coal trailers come down -- trains come down every single day, 115 cars. They have four generators of natural gas power and four generators with coal power.

And one coal power is very special, it is called Petra Nova. They capture over 95 percent of the CO2 in the process, put in a pipeline, sent it about 60 miles south southeast and get oil out of the ground. That is happening right now in my hometown, or in my home district of Texas 22. I can see that from Sugar Land, Texas.

Okay, my brag about Texas is over. Let's get serious.

Mr. Moser, unlike others on the witness panel today, your company mainly uses financial products like an insurance policy. What would happen if these financial products aren't available?

Mr. Moser. The risk that we are otherwise covering with those insurance products would either be borne by us and passed through to consumers at what we think, you know, what we estimate that would be or we would have to find a replacement product which would not be administered by the PJM or the ISOs. We would have to go to Nodal Exchange or something like that to try and fill it somewhere else.

Mr. Olson. Is it different for retail and wholesale

products, I mean differences between those markets?

Mr. Moser. So as far as FTRs go, the FTRs as they are constituted and show no difference between a retail or wholesale when all you are doing is locking in the congestion basis between two points and they are equally effective for hedging either generation or retail.

Mr. Olson. And how often does a trade go bad and what kind of internal oversight do you have to make sure that doesn't happen?

So we have a very fulsome risk process and risk policy and a risk department which oversees the trades that we put on. And the definition of a trade going bad is probably different between me and from one in which a strictly financial participant is. So when I am talking about hedging I am literally saying I sold something for $30 and I am buying it for $28 and I have locked in $2 of margin.

So I am indifferent to what the FTR does because it is in effect, if I paid $5 for the FTR and it comes in at 4 that looks like a loss of 1, but in effect I was getting rid of risk and I am happy because I locked in my margin. However, if a purely financial or spec trader bought something for 5 and ended up settling for 4 that would be the definition of a bad trade. For me it is a hedge, it is not a bad trade. It was eliminating risk that I wanted to eliminate.

Mr. Olson. Thank you.

Now let's bring in Mr. Allen. I understand that each region

offers different types of financial trading products. From your experience, are there certain RTOs who offer unique or particularly successful types of financial trading products? If so, please explain.

Mr. Allen. Yes, sir. I do. I think it is called ERCOT.

Mr. Olson. I am familiar with ERCOT.

Mr. Allen. What is unique about ERCOT, you know, ERCOT in Texas has the most vibrant retail market. And I think part of the reason why they have the most vibrant retail market is they have the widest availability of financial instruments to allow retail competition. And what we have been advocating for both at FERC and in the stakeholder process and now here before you, we would like to see a point-to-point product -- that is why they call it an ERCOT -- in all the ISOs. It is an excellent mechanism by which it, you know, people can use it, retail load-serving entities can use it to hedge.

The FTR is great. The FTR is a longer term instrument. It is a minimum of 1 month out a number of years. The point-to-point product is a daily to real-time product that it exists somewhat in PJM although they are trying to get rid of it. It is a central for retail competition hedging.

Mr. Olson. Mr. Moser, do you care to brag about Texas too like Mr. Allen, ERCOT?

Mr. Allen. Yes. So ERCOT is different than a lot of the other markets in a couple of fundamental ways. First of all, it

is one of the few places where we see load growth. There is very little load growth in other places. Texas is growing between, depending on how you do the math, 1-1/2 and 2 percent.

Other markets, the other major differences, Texas is an energy-only market. We only make money when we are dispatched and we run or when a customer freely chooses for us to be their retail electric provider. You know, we are not a utility in that respect, but we also don't have any capacity payments which are, call it insurance policies that other assets and other markets have.

Mr. Olson. My time has expired. Chairman, I did not mention my Astros being the baseball World Series champions. I yield back.

Mr. Upton. We are proud of the Astros.

Mr. McNerney?

Mr. McNerney. I thank the chairman. I don't really need to brag about California every time I get the microphone, Chairman.

You know, I found your testimony very enlightening, you know, there is so much to learn. It is a complicated market, so thank you for coming and giving us your testimony. I would like to start with Mr. Hildebrand.

Do you consider yourself to be like an inspector general of the Cal ISO system, I mean analogous to federal agencies?

Mr. Hildebrandt. I wouldn't call it inspector general. It

is called the independent market monitor. FERC requires each RTO/ISO to have one. I think I view our job is to be, you know, analyze the data, monitor the markets closely, and call it like we see it, objectively, for both the FERC, for our management, for the board, and for stakeholders as well.

Mr. McNerney. Well, how would you respond to Mr. Allen's remarks about the Energy Imbalance Market, his claim that their entry to Cal ISO improved efficiency and reduced greenhouse gases?

Mr. Hildebrandt. Well, I think he was -- the question to him was why don't they have virtual bidding and if they did I guess would it lower prices. And the reason they don't have virtual bidding is there's no day-ahead market in the Energy Imbalance Market. So to have virtual bidding you have to have day-ahead market and real-time market. There is no day-ahead market in the Energy Imbalance Market, so of course they don't have virtual trading there.

Mr. McNerney. So it is not a real clear case.

Mr. Hildebrandt. It is not an issue. You know, if they were to join the California ISO and have a day-ahead market they would therefore have virtual trading as well.

Mr. McNerney. One of the things you mentioned was that the markets should be organized to allocate auction revenues better. You sort of dwelled on that. How would you go about doing that?

Mr. Hildebrandt. Well, I think where -- so as I tried to lay out we agree that FTRs should be used to allocate congestion

revenues back to the transmission ratepayers, but we are calling on the ISOs to not auction off additional FTRs. And if they did that all the congestion revenues, if there was just no auction it would automatically go back to transmission ratepayers.

Ms. Sidhom, I think her first point was that FTRs are a way of getting congestion revenues back to ratepayers.

Mr. McNerney. Right.

Mr. Hildebrandt. Well, if you just don't auction them they automatically go back to ratepayers. And they are doing a very bad -- the FTRs, if you view it as an instrument for returning congestion revenues to ratepayers they are failing miserably at that. In California they are only returning 50 cents on the dollar and in other ISOs it is more, maybe 80 cents on the dollar.

So they are not returning -- so our proposal is pretty simple is allocate FTRs to load-serving entities but then don't auction off the rest, a lot of those congestion revenues to go back ratepayers. If, you know, the free market, they are free to buy and sell hedges, insurance, if you will. You know, I think that is the role that financial entities they are very creative people. They are good at managing risk. I think they are free to sell price swap contracts to generators such as NRG to hedge their risk.

And we think that mechanism, a market between, you know, willing buyers and sellers is what will give you the correct, efficient, and fair price for I think what has been called, here, insurance policies.

Mr. McNerney. All right, thank you.

Mr. Minzner, you sort of dwelled on the cost market and manipulation between the physical market and the sort of financial markets. How would you propose that they be better regulated? Is there an important distinction that needs to be made between the types of transactions or how would you do it?

Mr. Minzner. So I think that is a great question. You know, cross-market manipulation has been something the agency has focused on in its exercise of enforcement authority ever since EPAct 2005, which arose out of the western power crisis largely focused in California. I do think FERC has been doing a good job at looking at this type of conduct trying to build the analytic and oversight tools it needs to be able to detect the conduct and when appropriate stop it.

I do think it is an area where the agency has had to make sure it has the data it needs about trading both in the FERC-regulated markets as well as the markets regulated by the CFTC and other regulators. As you can imagine, for market participants they care about the financial positions they hold broadly across all the markets, so it is important for the agency to make sure it can see all of those positions. I think it is an area where the agency has been succeeding largely, but it is certainly a work in progress. Mr. McNerney. I wanted to ask you a question, Ms. Sidhom, but I have run out of time, so you will have to take it up with another -- I know you wanted to

respond to Mr. Hildebrandt's comments. I yield back.

Mr. Upton. Mr. McKinley?

Mr. McKinley. Thank you very much, Mr. Chairman. Sorry that I slip out. Like you said, we have another meeting going downstairs to get back to.

I missed some of the presentations that you had, particularly Mr. Duane's comments from PJM. But we have had a series of hearings in the last year plus over resiliency and dependability in our grid, and so as a result perhaps, I know, I think in your testimony you were going to say something about the rule, or the directive coming from the DOE over to FERC, how to take care of this. One of the arguments that I have heard here so many times in committee has been market rates. The market rate should make that determination. Well, I am in agreement to some extent, but the market rate there should be a difference between market rate and dependability rates so that we know when we have a polar vortex or some problem that we know we can count on their being power available to folks.

Because of this pricing system that we have set up, I am concerned about how that could be, how that is going to come into play if FERC were to recognize that dependability is just as important as market rate. Because on market rate I am trying to find an insurance policy for people that during bad weather they are going to have electricity.

And I know it has been a very divisive issue ever since that

has come out, and we know that in PJM 20 percent of the power plants went down during that period of time. So I am looking for that kind of support level in the pricing.

So, Mr. Duane, if you can give me some, a little bit better explanation, a little bit of how the financial trading tools, how they could be impacted if FERC were to come out with some kind of movement which in many respects it would be like an insurance policy that would give us some assurance that we are going to have power for our grid.

Mr. Duane. Right. Thank you, Mr. McKinley. You know, you are touching as you point out on a very complex and controversial area and it is a fair question to ask right at the outset, are these organized markets returning a price that is fully valuing all aspects of the infrastructure that people are relying on to keep their lights on and to heat their homes and power their businesses.

It is a fair question because you can't assume in these markets that just where supply and demand meet you will get the right price because, as I mentioned, they are very highly engineered and revenues in these markets are very highly contested. You have the Department of Energy asking the Commission right now, are these markets adequately compensating generators for the full panoply of value that they are providing or is there something missing in the markets.

And the gauntlet that has been thrown down when you also

consider on the other side of the equation are consumers who are very wary of paying any more than they need to for electricity. So we have to ask ourselves a question, is the system working? Are the prices correct? When you hear the term price formation that is really what it means, are prices being formed correctly in these very heavily designed markets.

The point of interplay with the financial trading is if we are not getting any efficiency value to assist in these markets from financial trading it really is siphoning revenues off the top. It is a hole in the bucket in the system. And the squabbling that is going on between load and generators as to whether generation is getting paid enough, whether load is paying too much, you know, there is another point to be made here is like, well, are we running a system that is fully efficient or are we having some leakage here so that the pie is shrinking.

And I think the point here is there is a lot of value for financial trading, but where it isn't providing value it needs to be curtailed and limited, rationalized, so that we do preserve revenues to support the physical participants in the market.

Mr. McKinley. We also spoke at the last hearing about the Longview Power Plant and the impact that has as the most efficient coal-fired power plant in America, but because of the network of pricing they are having trouble being able to market their electricity into the system. And so you all were going to get back to me. I haven't heard from anyone yet.

Mr. Duane. Okay. Well, I apologize for that. I am not familiar with the request itself, but we will definitely get back with you on an examination of that question. We are very familiar with the Longview Plant. It is a relatively recent coal plant, highly efficient waste coal facility. It is located right on top of the Marcellus Shale fields so it does face stiff competition from a lot of new combined cycle generation.

But your larger point and I think it is one we agree with at PJM is that when you are running a reliable system over the long term and you want resiliency, putting all your eggs in one fuel basket doesn't sit well with a lot of engineers and planning people, so we are sensitive to the point.

Mr. McKinley. Thank you very much. I appreciate it. I yield back.

Mr. Upton. Mr. Peters?

Mr. Peters. Thank you, Mr. Chairman.

I wanted to get back to Ms. Sidhom. So it is always a little difficult because I get, you know, we don't have a discussion. We sort of get six pre-prepared things which are all very interesting, but I am trying to connect where the differences are. What I would like to see, maybe you could respond to Mr. Hildebrandt's concern that consumers aren't getting the value of these trades particularly on FTRs.

Ms. Sidhom. Absolutely. So I think California is unique in that it has some of its own challenges with the markets. And

the problem is not with the FTR product, the problem is with the market design. They have got significant modeling issues so they will clear you out of the money all the time. Meaning, let's say, I will just give you an analogy of the equities market to keep it simple.

Let's say you want to buy a stock for $30 and your broker comes back and says we sold it to you for $60. That happens in California all the time. There is something wrong with their pricing model. Also, their outage scheduling is a real problem so about over 50 percent of the time the outages are not submitted in a timely manner to be modeled in the auction and that is what causes a lot of what Dr. Hildebrandt is referring to as revenue adequacy, so the underfunding of the payments going back to the load-serving entities.

So it is not the FTR product that is the problem. You absolutely need the auction because the auction is how you actually price the allocated rights. So essentially, you allocate rights to load-serving entities and then how do you get a price for those allocated rights. I give you ten stocks, what is the price for them? The price for them is obtained when the access capacity is auctioned off. I don't know how else you would be able price them.

As Vince's testimony stated, the FTRs were an integral part of the market design. They weren't just an option, they are how we provide open access.

Mr. Peters. Okay. Mr. Hildebrandt, can you respond to that?

Mr. Hildebrandt. Okay. Working backwards, it is absolutely incorrect that the allocated, we call them CRRs, FTRs are priced based on the auction. They are allocated out, load-serving entities hold them, and they get paid the congestion revenues. So by not selling them, they get a dollar, the full dollar in congestion revenues versus which is on average a price in the auction which is only 50 cents on the dollar.

So the ISO allocates to load-serving entities. They keep those. They keep the congestion revenues. But then the ISO auctions off additional FTRs which sell for 50 cents on the dollar and those are bought primarily by financial entities with -- and then the payout directly reduces the pot of congestion revenues which otherwise then gets fully refunded back to transmission ratepayers.

So, and as California is different, it is true the payout, our analysis shows while it is 50 cents on the dollar it may be more like in the 70 or 80 percent range in the other ISOs. But in other ISOs across the country, and we have now almost a decade worth of experience that even in the other ISOs ratepayers are only getting back about 70 or 80 cents on the dollar of the congestion revenues that they are paying for.

Mr. Peters. So would there be some margin where they shouldn't get back, do you think they should get back a hundred

percent?

Mr. Hildebrandt. Well, if entities are buying these as hedges, if I am a generator and I am buying them as hedges I would actually expect a hedge to go for premium. If I am buying an FTR to take away the uncertainty of my congestion, I am a generator, I am NRG and I want to sign a deal somewhere for the fixed price and I want to get my power there from a generating plant, I should be willing to pay a premium. In fact, I think the hypothetical example he offered had him losing a dollar on the FTR.

The fact is these are, they are earning, you know, it is an insurance policy that pays you, you know, a hundred percent on your premium. So it is not, so that analogy I think doesn't work.

Mr. Peters. Okay.

Mr. Hildebrandt. And, you know, if they were being purchased as hedges we would expect the price to be, you know, equal or above the congestion revenues. I guess our final point is you don't need the ISO to run that auction because basically we are auctioning off things, insurance that is backed that is subsidized by ratepayers. Let the transmission ratepayers decide if they want to enter into those contracts.

Have a market with if you want the ISO to run it, run a market if you don't think, you know, that private trading firms can do that, if you have the ISO run it base it on real bids from willing buyers and sellers. The financial entities here can offer to sell hedges, the generators here can offer to buy hedges, and if you

want the ISO to run that market that is fine. But don't ask the transmission ratepayers to subsidize that.

Mr. Peters. Ms. Sidhom, again, I have 7 seconds. Go ahead.

Ms. Sidhom. So there is a risk premium built in because of these outages and that is why those dollars are not going back.

Mr. Peters. Right.

Ms. Sidhom. That is what is really creating the risk for the buyers. And so there is a risk premium that is being built in, but it is because of the market design issues.

Mr. Peters. It suggests that it is market design.

Mr. Chairman, I would yield back.

Mr. Upton. Mr. Shimkus?

Mr. Shimkus. Thank you, Mr. Chairman. This is a great hearing. I want to commend Mr. Peters. It is a great way to engage with our panel is to try to find where there is discrepancy and I just want to thank him for doing that. I am going to follow a little bit along because, you know, we are concerned about the national grid and reliability, but we also have our local parochial interests that deal with these markets.

So I would like to start with Mr. Duane on in dealing with when the transition from regulated markets to the RTO model, PJM converted many entities from transmission rights to these financial transmission rights. How do you protect against additional risk for those who have lost their firm transmission rights? Are there entities that end up becoming losers in this

transition?

Mr. Duane. It is a very fair question. The transition really took place quite a few years ago, really over a decade ago, and I think it is fair to say the transition from being a firm physical customer to having a financial transmission right, which as Ms. Sidhom said is a fundamental element of the design structure, that was a fair exchange.

What has happened though is nothing is static. The system changes. Load grows in different places. Load disappears in different places. Generation comes, generation goes. That changes the typology of the system and, frankly, the FTR was intended to anticipate those changes and provide options. Not just market options, but opportunities for people to designate different pathways.

People being typically in PJM, these are load-serving entities who are trying to manage the risk of congestion or price differential. And as the system changes physically, there are opportunities that the FTR provides to reconfigure your pathways to reflect how electricity is more realistically flowing to you today as compared to where it was, say, 10 years ago.

But short of transmission infrastructure build, there will be customers that are not as hedged today under this system as they would have been 10, 12 years ago.

Mr. Shimkus. Right. And I would speak to expanding our transmission grid to allow those more flexible markets instead

of, in essence, kind of dedicated pathways and convoluted systems that sometimes we develop.

I want to go to Ms. Sidhom and Mr. Allen real quick. On financial trading institutions such as yours when you execute financial trades with the purpose of making a profit, when your company makes money from a financial transaction such as this financial transmission right, where does the payment come from?

Ms. Sidhom. So we are basically offering a product. The payment comes from us offering this product which is where we are basically saying, look, we want to take the risk away from consumers, so how do we do that? We are natural buyers and sellers to -- or we are basically the willing buyers and sellers to natural buyers and sellers, so that is where the payment is coming from. We are basically offering the other end of that transaction liquidity in the market.

Mr. Shimkus. Mr. Allen?

Mr. Allen. Yes, that is correct. Now there is a differentiation between what our two entities do. They are more FTR-focused. I am focused on the day-ahead and real-time. If we add efficiency to the market, if we improve the commitment, if we improve the reliability of the system then we make a profit. If we create inefficiencies or we get the day-ahead wrong then we lose money.

Mr. Shimkus. Okay, so let's go to the consumer. Do the consumers pay for your payout through their electricity bills?

Mr. Allen. Well, each ISO acts as essentially a clearing broker where all of our transactions are cleared. So I put in buy and sell orders with PJM, they return whether we make or lose money. One thing to point out and I think it is important and it is in my written testimony. What is the load-weighted price of electricity in PJM? Wholesale level $29.23, so under $30. What is the retail rate in that same area? It is about $110 a megawatt, so wholesale prices are cheap. They are really cheap.

Mr. Shimkus. Ms. Sidhom?

Ms. Sidhom. Yes. I mean I think we absolutely save the consumer a lot of money. Both in MISO and PJM, they estimate over $2.5 billion of savings a year from having these markets in place. You know, these are heavy policed markets. The CFTC is looking at us, FERC is looking at us. We have market monitors like Dr. Hildebrandt looking at us. If FERC thought that we were siphoning money from consumers I think they would have put a stop to these transactions a long time ago.

Mr. Shimkus. I have 730,000 people watching me, so -- anyway, yield back.

Mr. Upton. Mr. Green?

Mr. Green. Thank you, Mr. Chairman, for holding the hearing.

Mr. Moser, in your testimony you talk about FTRs hedge against congestion charges for end user, end user consumers. How much risk is there from the congestion charges that could

potentially be pushed to consumers if it weren't for this product?

Mr. Moser. Well, it would be pushed indirectly to them basically to the extent that none of the -- or very few of -- and when I am talking about retail consumers here, I am talking about homeowners not the large commercial and industrials who have a more sophisticated way of going about it and tend to shoulder some of the market things directly. But in terms of consumers, if the FTRs didn't exist and we had to price that in then rates would go up.

Mr. Green. In the Texas retail market, of course Texas is different as we say all the time from other markets, but retail market, where do we most often see congestion being an issue and how are these products used within the state?

Mr. Moser. Yes. We have historically seen a decent amount of congestion coming from the western part of the state where you have a lot of the wind assets flowing into through congested lines trying to get to Dallas and trying to get down into Houston. Texas has built the CREZ lines to try and alleviate the into-Dallas area portion and then they are working on a Houston import project right now to try and alleviate some of those congestions.

But those are two of the classic ones. Really, anytime you are talking about congestion you are talking about, you know, assets, generation far away from load pockets and so the load pockets are often the congested pieces.

Mr. Green. In the wholesale market when it comes to selling

forward on a basis how do these products mitigate potential losses?

Mr. Moser. So when we use, and this is different than just FTRs, right. I mean, you know, through ICE, which was explained by Mr. Minzner and others, we can go out and see where the price of next year, next month is trading. We can put positions on, sell some of our expected generation and lock, and then go and buy some fuel against that lock in what we expect to be our generation spread, our profit.

But those sales are often at hubs where people agree to gather and make bulk purchases and sales. What we then would do would be go and try and perfect that hedge by using the FTRs to move where we have that sale to a location that approximates our generation plant.

Mr. Green. Okay. In your testimony you talk about 46 percent of the NRG's coal capacity in Texas from 2017 to 2020 has been forwarded or sold higher than other areas of the country. How does that compare to the other generation sources like natural gas at NRG? And of course you have a nuclear plant in southeast Texas. Is one fuel source forward sold more than another and what plays into that?

Mr. Moser. Yes. Oftentimes we tend to sell more of our coal rather than the gas because the coal tends to be at the money or in the money and so we have a large expected value with that. Our specific portfolio is a bit like a barbell. We have a lot of coal

and nuke on one end which runs all the time and then we have a lot of old expensive steam gas which doesn't run very often so we tend not to hedge that as much and kind of use that to try and hedge against our retail exposure.

Mr. Green. What are some of the differences or difficulties in working in markets like ERCOT which lack capacity markets in other ISOs where the capacity revenues are established for a long-term forward basis?

Mr. Moser. Well, it is easier in a market like PJM where you have a 3-year forward look at where the capacity prices are in terms of trying to determine the economic viability of your power plants.

Mr. Green. Okay.

Mr. Chairman, that is my last question. But to follow my other colleague from the Houston area, when your house has six foot of water in it and you are so happy to have something to cheer about in the World Series.

So -- but again in my last minute, how did NRG deal with some of the problems we had? I heard that for example the coal plants had to shut down because the coal was so wet that natural gas was still there and of course the nuclear plant continued to produce.

Mr. Moser. The South Texas Project stayed online throughout Hurricane Harvey. We did run into problems at a couple of gas plants in the Greens Bayou which is in the northeastern corner got flooded. Cedar Bayou which is down near the ship channel was

at one point we thought was going to get flooded. What we did was basically we brought three shifts of people in -- cots, MREs -- and prepared to ride out the storm, in effect.

But what you heard about Parish was absolutely correct. We did have at one point those coal plants -- look, coal doesn't move up conveyors very well when it is liquid, it just kept running down, so we had to switch over to gas on those and we also brought the gas plants up. So I think at our low point we were in the 70 or 75 percent availability across our fleet in Texas. Limestone is far enough north that it wasn't impacted, but.

Mr. Green. Okay. Thank you, Mr. Chairman.

Mr. Upton. Mr. Griffith?

Mr. Griffith. Thank you, Mr. Chairman.

Dr. Hildebrandt, Mr. Shimkus asked some questions earlier of Mr. Allen and Ms. Sidhom, and you heard their answers. In particular, Ms. Sidhom said if there were real problems on where their profit comes from, if it was negatively impacting consumers that you would be all over them. So I am going to give you a chance after you have heard their answers, what say you?

Mr. Hildebrandt. Well, we are calling for this, and actually the independent market monitor in PJM has been doing this for 3 years. So the market monitors whose job, who have the data and the information, whose job it is to look at these kind of things, in fact, are calling this out and providing the kind of analysis we are providing that is showing, you know, ratepayers

are getting only a fraction of the dollars back from the FTR auction that they would otherwise get. So we are here. That is why I am here today.

Mr. Griffith. What I am hearing from these folks, and I don't know a lot about this product so I am not taking sides, but what I am hearing is most everybody seems to think that this in the end makes sure the consumers have power and that they are getting a fair deal because these folks are making it more efficient.

And all they are doing from what I gather in interpreting their statements all they are doing in most cases is taking a portion of the savings that go to the consumers and that is where they make their profit by figuring out how to make the system more efficient. Do you disagree?

Mr. Hildebrandt. Yes, I absolutely disagree. Part of the issue here, we have two very different products being discussed here today. There is the virtual trading and I believe the benefits that Ms. Sidhom cited, I believe, is somebody's estimate of what virtual trading may have saved. That is very different.

Virtual trading is our trades between willing buyers and sellers. When the ISO clears the virtual that is cleared as part of an energy market which is a market between willing buyers and sellers. In that kind of market there can be value from that. However, in the FTR it is a very different product. It is an auction. It is not an actual market. They are auctioning these

things off for 50 cents on the dollar.

In terms of the congestion revenues they are not providing any value in terms of, you know, they are siphoning off money which I think otherwise could be used to offset the costs of investments in the physical system, physical generating plants and physical infrastructure. So I think in that sense they are siphoning money out of the system without increasing efficiency in a way that ultimately can hurt reliability because it, you know, it does decrease, you know, kind of the money that can be used to improve the transmission system at a reasonable price to consumers.

Mr. Griffith. So what do you think we should do to solve the problem as you see it?

Mr. Hildebrandt. Well, as I have said, I think we continue with the allocation of FTRs to load-serving entities. That includes direct access customers who, you know, are buying power through retail choice. But then stop the practice of having ISOs auction off FTRs backed by congestion revenues that otherwise go to load-serving entities. Stop that auction.

I think at that point my position is I think ICE, you know, you heard the gentleman describe how ICE it is a private company exchange. They provide long-term contracts for gas, for energy. You know, let the markets work. Again these gentlemen, Mr. Allen and Mr. Moser can deal through ICE or bilaterally as far as selling a hedge at the appropriate price. That is what they are good at.

If policymakers really think ISOs, that the free markets

can't work there and ISOs need to step in, then do that through an FTR market that only clears bids from willing buyers and sellers, so only if load-serving entity bid into that market to sell a hedge would they be exposed to having to sell an FTR.

Mr. Griffith. All right. Now the dilemma that we have is we only get 5 minutes for questions. Mr. Allen, do you want to respond to any of the comments that were made? I probably won't have time for you, Ms. Sidhom, to get back in, but maybe somebody else will give you a minute.

Mr. Allen. I am glad we agree the virtuals are good. As far as the other stuff what I would advise, there are many market monitors throughout the country. Not all of them agree with the position that Dr. Hildebrandt has. Any as sort of analysis that FERC or you guys see about the value or the lack of value of FTRs coming from one market monitor or another, all I ask have it peer-reviewed. There needs to be some sort of peer review of anybody's analysis so that, you know, and market monitors have a tremendous amount of power and their analysis should be peer-reviewed. Thank you.

Mr. Griffith. And I guess you all can appreciate that this is not our field or at least most of us up here, and we are just trying to get the facts to make sure the American consumers are getting the best deal that they can get. And with that I yield back.

Mr. Upton. Mr. Johnson?

Mr. Johnson. Thank you, Mr. Chairman. I appreciate the opportunity. And thank the panel for being here this morning. You know, the FERC chairman, Neil Chatterjee, recently stated that one of the FERC's top priorities moving forward will deal with de novo reviews. As I am sure some of you are aware, the majority of the current court cases surrounding FERC's interpretation have gone on for years. Mr. Allen, do you have any thoughts on how FERC should address this?

Mr. Allen. I would think that something along those lines, de novo review, is probably best left to the courts to decide. It is not, you know, I am not a lawyer, I am not, so I really can't offer you a good opinion on it other than I think it is probably, you know, let the courts figure it out.

Mr. Johnson. Okay. Ms. Sidhom, do you have any thoughts?

Ms. Sidhom. Absolutely. And I think that Chairman Chatterjee addressed that issue because FERC has lost on it multiple times in court now. We all want a robust enforcement program. That is really important for us. We need a cop on the beat. Nobody wants to participate in a market that is not being heavily policed, especially such a volatile market.

So, but what we really want is an efficient enforcement process and I think that the courts are making the absolute right decision on de novo review.

Mr. Johnson. Okay, all right. Now maybe some of this has already been covered so I apologize if you feel we are being

redundant here. But we have heard from Dr. Hildebrandt regarding his thoughts on FTRs. Mr. Duane, what are your thoughts? Do you have any?

Mr. Duane. You know, I think he is asking a question that is a legitimate question to ask. I think it is always the right question to ask, because at the end of the day as I said several times here this morning, and I don't mean this to disparage the financial participants, but they are there to serve a purpose and that is to make sure that the physical participants and, in particular, the consumer at the end of the day are getting the best deal possible out of these markets. That is what the fundamental design mission is. And I think they can bring that benefit, but it has to be scrutinized. So the questions about the design of the market, they get pretty arcane when you are looking at the allocation of FTR revenues and I honestly don't think I can add anymore to that.

But the litmus I kind of use is if I see real risk management, if I see someone speculating and taking risk off the table, if I see them hedging, those are good types of financial transactions and people should be entitled to earn a return for providing those services and customers who pay a premium to get that insurance should feel comfortable about that.

Where I get more concerned is where there is arbitrage which should bring convergence among prices, but I don't see it actually happening. And that is really where I am coming from at PJM is

a concern that at that point we do have a siphoning problem, we do have a hole in the bucket. I think FERC can separate the babies with the bath water and we can put in place rules to do that.

As far as the FTR market goes, I am just not at a point to say that is an example of one of those types of problems.

Mr. Johnson. Okay. Mr. Shimkus began to address this as well. Monitoring Analytics, the independent market monitor for PJM, found in the most recent State of the Market Report that -- and I quote. It is not clear in a competitive market why financial transmission right purchases by financial entities remain persistently profitable. In a competitive market it would be expected that profits would be competed away.

Do you agree with this statement and if not, why not?

Mr. Duane. No, I do agree with that statement. I am not sure it is a fair characterization of what is going on in PJM but, theoretically, yes, a competitive market should show over time a balance. And if there is a persistent asymmetry and what I think our market monitor is saying is that his observation over a period of time is that there is a persistent asymmetry and FTR traders have made money rather consistently.

I am not sure factually that is correct and I would want to look into that further, but if that is correct it is the kind of yellow flag that says maybe there is something structural in this complex market design that needs to be examined so that we do have a more symmetrical outcome.

Mr. Johnson. Okay, all right.

Thank you, Mr. Chairman. I yield back.

Mr. Upton. The chair would recognize Mr. Flores.

Mr. Flores. Thank you, Mr. Chair. And I appreciate this hearing and appreciate the witnesses participating today. It has been very informative.

One of the principal reasons we have hearings like this is so that we as policymakers can determine how involved we should be or not be in terms of trying to make sure that these markets work correctly. So my first question is this. What potential market regulatory reforms should Congress and FERC be considering in order to improve market benefits associated with financial trading?

So I would start with Ms. Sidhom. Can you share your thoughts? And try to do it quickly if you can.

Ms. Sidhom. Yes, absolutely. We need long-term auctions just like you guys mandated in the Energy Policy Act of 2005. Those are integral to provide a forward price signal.

I also kind of want to address just a few comments that Mr. Hildebrandt made. California just put out a report negating a lot of the things that he said about FTRs, so its own ISO is not in agreement with him. They specifically say there are market design issues that they need to fix. So one of the reforms we really need is better outage scheduling and I touch on that in my testimony.

So, essentially, if I am a transmission owner and I don't plan out my outage, I should have to pay the costs that are incurred to the system for not planning out that outage. And New York employs that very practice and they save a lot of money. They have very few unplanned outages. That and technology reform, I think, really needs to occur.

I mean we have certain ISOs where some of their modules don't even work with like Chrome. They work with Internet Explorer but old versions of it, like we are really behind in technology.

Mr. Flores. Okay. Mr. Allen?

Mr. Allen. Real-time congestion hedge like exists in ERCOT, I would love to see that. We need to see that. It is necessary. It is essential for retail competition.

Mr. Flores. Okay. Mr. Moser?

Mr. Moser. I would say there is plenty of things on the FERC docket already in terms of the different price formation dockets that they have been sitting on for years that we could move forward with immediately, some of the minimum offer price rules and et cetera. So there is plenty of stuff for them to do.

Mr. Flores. Okay. I would ask you to supplementally follow up and tell me what the top three or four are, if you would.

Mr. Allen. Happy to.

Mr. Flores. Mr. Allen, also in your testimony you stated that competitive markets should be allowed to operate with minimal government intervention such as out-of-market subsidies. If

that intervention occurs, how is financial trading affected and do you have any recent examples?

Mr. Allen. If you have an out-of-market payment going to a certain class of generation assets it will distort market outcomes.

Mr. Flores. Sure.

Mr. Allen. I think what is important is if there are certain externalities that are not being looked at that aren't being valued, whether it is carbon or reliability or so forth, I would ask that they be placed into the market so the market can respond to it and you don't distort market outcomes.

Mr. Flores. Okay.

Mr. Minzner, in terms of enforcement of financial trading you stated that financial markets inevitably move much faster than regulators. I think we all know that about this town. Is there anything Congress can do to ensure that FERC can remain nimble and to be able to evaluate new offerings of increasingly complex financial products?

Mr. Minzner. So I think that is a great question, Congressman. I think largely it has been a success. I think Congress has, when problems have arisen in the energy markets, taken appropriate action -- EPAct 2005 is a classic example of that -- but also left it to the agency recognizing the complexity of these markets to adjust them as necessary as new products have developed.

It is not just that the markets are complex. They differ regionally. As you have heard, PJM is quite different from California and they are both very different from Texas. That has been a model that I think has been largely successful, but I really do think it is up to the agency to be constantly be reevaluating the structure of the market and the products that are available.

Mr. Flores. Thank you, Mr. Chairman. I am going to yield back a minute to you.

Mr. Upton. The chair would recognize Mr. Barton.

Mr. Barton. Thank you, Mr. Chairman, and you and Mr. Rush for this hearing.

I have not really followed the electricity markets for a number of years so I am trying to get my hands around what a virtual transaction is. I don't know who to ask, I guess Mr. Moser. Are these transactions that are called virtual transactions, are they in and out the same day transactions?

Mr. Moser. Yes. To the extent that the ISOs, if you put aside the FTR auctions, are running simply a day-ahead auction for power delivery tomorrow, then what the virtual transactions do is allow -- so when I offer my plants in, you know, we will take Joliet 6 and we will say it is a $35 unit and we will offer that in to PJM in the market, and then if PJM needs $35 or higher power at that point I will get a commitment that I then have to run to for the next day and I will get paid 35 for it.

Mr. Barton. Well, that sounds like a real transaction.

Mr. Moser. That is a real transaction. But a virtual transaction would be if, you know, if a financial participant put in an offer at 35 and it looks just like generation in terms of going into the stack, it can get chosen and then basically what they have done is they have sold 35 in the day-ahead market. They are going to get $35 times however many hours times however many megawatts, and then when they don't deliver anything the next day because it is virtual -- and this doesn't come as a surprise to the ISOs. The ISOs know what is virtual and what is real -- then that settles against whatever the real-time price is.

So they basically have, they get paid 35 and then they are going to pay back to the ISO whatever the real-time average is for those same megawatts for that same timeframe, and it may be plus and it may be minus.

Mr. Barton. So they have to deliver but they don't have to produce; is that --

Mr. Moser. Well, in effect, they are taking the financial obligation of delivering, you know, no one expects virtuals to deliver so make no mistake there. There is no chicanery there. But they are basically a way of taking a position day-ahead against the real-time sell.

Mr. Barton. But when a financial participant sells power at $35 a megawatt hour --

Mr. Moser. Day-ahead.

Mr. Barton. -- for tomorrow delivery --

Mr. Moser. Yes.

Mr. Barton. -- sometime that day do they take a position where they go in and buy, get a commitment to provide that power tomorrow at a lower price?

Mr. Moser. Well, they may have, they may be doing that because they have a longer term position on that the ISO is not aware of. But generally speaking and in its simplest form, they have said I am willing to sell $35 power because I think the price tomorrow is going to be less than that and they are willing to take that risk on what that is for tomorrow's price.

Mr. Barton. I guess the gentleman from California who kind of monitors this, are these virtual transactions helpful or hurtful to the real-time delivery of power and the pricing of power? You know, because California as we remember some of us old-timers, 10 or 15 years ago you had the perfect market, you thought, and it all went to pot.

Mr. Hildebrandt. Okay. Well, our market is working pretty well now, I think, Ms. Sidhom's comments notwithstanding. And so, you know, again you really need to differentiate. I have been talking today about financial transmission rights so, but you are asking me then about virtual.

Mr. Barton. I am just trying to understand.

Mr. Hildebrandt. Sure.

Mr. Barton. Because I don't think the public understands it.

Mr. Hildebrandt. We have them in our market. We think they can be beneficial to help kind of to help converge the day-ahead and real-time prices especially when you have a lot of renewables, so they can be beneficial. Unfortunately, they can be used also to manipulate the market. We have had cases like that. And specifically, you know, there are now cases, public cases, where that virtual trades have been used to manipulate prices that then increase payments that entities who have boughten firm transmission rights have.

So there is again have been some issues with cross-market manipulation. If you stop the auctioning of the firm transmission rights, I think then that would remove the issue of cross-market manipulation between the virtual bidding, which we are not proposing to get rid of in California, and can add value and again is based on bids from willing buyers and sellers as opposed to the firm transmission rights which are distinctly different.

Mr. Barton. Okay. Mr. Chairman, my time has expired. Thank you for the courtesy of allowing me to ask them.

Mr. Upton. Yes. With that if no other members have further questions we will adjourn. Thank you very much.

Oh, and we are going to put something in the record. I am going to ask unanimous consent to put in a letter from Monitoring Analytics into the record.

[The information follows:]

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Mr. Upton. And with that we stand adjourned. Thank you. Thank you.

[Whereupon, at 11:53 a.m., the subcommittee was adjourned.]