COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

CASE NO. PUR-2024-00144

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DATA CENTER LOAD TECHNICAL CONFERENCE :

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ORIGINAL

Held before:

The Honorable Kelsey A. Bagot, Commissioner

The Honorable Samuel T. Towell, Commissioner

The Honorable Jehmal T. Hudson, Commissioner

Monday, December 16, 2024

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Pursuant to notice, before Joshua Tubbs, Notary Public of the State of Virginia.

C O N T E N T S

P R O C E E D I N G S

THE BAILIFF: Today's docket consists of case number PUR 2024-0144, Electric Utilities and Load Growth Technical Conference. The Honorable Kelsey A. Bagot presiding.

COMMISSIONER BAGOT: All right. Good morning, everyone.

All right. We got our panelists' tent cards all set up? So good morning, everyone, and welcome to today's technical conference on Electric Utilities and Load Growth, which has been docketed as case number PUR-2024-00144.

First of all, I just want to thank you all for being here today. And a big thanks in particular to our esteemed panelists for their willingness to participate. Wouldn't be much of a technical conference without all of them being here today, willing to share their knowledge and expertise with us. So thank you in advance.

Before I kick off and turn to my colleagues for any opening remarks, I want to touch on a few quick run-of-show matters. As laid out in today's agenda, today's technical conference has been broken down into three panels, each which will run approximately for two hours. We've attempted to divide up the panels on different -- based on different subject matters, but we

recognize that there's a lot of overlap between the various panel topics. And so we know that there'll be a little bit of overlap in discussion. So we expect that. Don't worry if you tend to stray or if you want to react to any of the comments made in earlier panels.

At the start of each panel, we will invite each panelist to introduce themselves and provide brief introductory remarks. There is a time clock.

Jabari, is it over --

Which hopefully you all can see. That is to help keep -- us keep track of time as you speak. We're not going to cut you off if it hits zero. And you certainly don't need to take all of the time allotted on the clock, but it's there as a reference for you if you need it.

Once we get past introductory remarks for each panel, we're going to jump into what I really hope will be the heart of each panel, which is the Q and A between the commissioners and the panelists. Questions from the commissioners may be directed to individual panelists or the panel as a whole. If you wish to answer a question or respond to an answer provided by one of the other panelists, we'd ask that you raise your name card so it's vertical in front of you. And we'll do our best to try and call on you based on the order that your tent card

was raised.

Let's see. So the goal today is really to have a robust exchange between the commissioners and the panelists on each of the panel topics. So please don't feel shy about raising your card to speak or being responsive to other panelists' comments. That said, we'll ask that panelists keep their responses to a reasonable length of time so that we have time for as many questions as possible. We don't want to have to catch you off, but we will if we have to.

As a reminder, today's conference is being webcast and transcribed, and a copy of the final transcript will be publicly available and posted in the docket after the technical conference. And at the conclusion of today's technical conference, we'll provide some additional information regarding the opportunity for interested persons to file post-technical conference comments reacting to any of the topics discussed here today.

So before I go any further, I just want to pause there and see if our panelists in the audience have any preliminary administrative questions about the day. Hopefully we covered it all.

All right. I don't see any. So let's jump in. We are here today to talk about data centers and load

growth. Data centers have certainly become the latest and greatest topic of conversation, even outside the wonky inner circles of electric utility regulation. But they are a hot topic for a good reason.

I think it's safe to say that we all appreciate or are at least beginning to appreciate the unprecedented nature of data center load growth. There's a lot of it. It's coming fast. And it may have characteristics that differ significantly from the type of load that we've been used to seeing before.

So all of this presents a unique set of challenges and risks for utilities, customers, and regulators. And these are real challenges, significant challenges. There are challenges that include affordability of electric service, and there are challenges that include reliability of electric service. Wrestling with these challenges also presents us with a tremendous opportunity. If we do it right, we have an opportunity to reshape our energy landscape to be more efficient, more equitable, more green, and more reliable as we look at the future of electric service in Virginia.

To meet these challenges and come out better on the other side, no one person, utility, legislator, or regulator can do it alone, which is why we are here today. The goal was to get a lot of smart people in a

room together, representing a variety of perspectives to begin the discussion and start wrestling with the potential solutions we have at our disposal to address the challenges ahead.

Just to kick us off to the extent it'd be helpful, as I was thinking about these issues going into today's conference, I thought of three I'll say buckets or categories of problems as I think about them, and I'm hoping that we can sort of touch on these today, though certainly these are not the only topics we will touch on today.

The first, I think, is the question of fair allocation of costs as we go forward. So what is a fair share and a fair way for allocating these costs? Aside from that question of providing generation and the fair share -- or serving the load and the fair share of costs with respect to that, I think we then get to a second question, which is a risk mitigation question, which is a load forecasting risk and a stranded cost risk.

I think the third question that I've been wrestling with is the question of increasing pressure on energy prices, which we'll probably see in the PJM wholesale markets, regardless of whether data center development is precisely happening in Virginia or elsewhere in the PJM region. So what and how can we be

protecting our customers or taking risk-mitigating measures to protect ourselves from volatility or high prices that we see in the PJM market?

So the first question is, what is the fair allocation as we seek to serve these data center customers? How can we protect ourselves from stranded costs or load forecasting errors? And then how do we protect ourselves as a whole from changes we might see in energy prices in the coming decades?

So those were my initial thoughts in the interest of transparency and to get the dialogue started. I'm going to stop there, and I'm going to pass it off to chair Jehmal Hudson for any introductory remarks he may have.

COMMISSIONER HUDSON: Thank you, Judge Bagot. Before we begin, I'd like to express my deep appreciation for your leadership convening this inaugural technical conference. I also want to recognize Mitch Burton, Kate Creef, Alisson Klaiber, and the entire SCC staff for their hard work in making today's event possible.

To level set for everyone here, a technical conference at a public utilities commission like ours provides a collaborative forum where experts and stakeholders gather to address complex technical issues. These discussions focus on emerging trends and challenges

in utility operations, aiming to provide robust analysis and insight to guide regulatory decisions. Importantly, today's conference is not about resolving specific cases but about laying the groundwork for sound decision-making in an area of critical importance to Virginia's energy future.

The Virginia State Corporation Commission takes great care to fulfill its role as set forth by the General Assembly. The Commission strives to implement our authority under the statute in a manner that implements the General Assembly's intent and that protects consumers who expect reliable and affordable service. Where given discretion, the Commission strives to apply the law and regulations to balance the interest between utilities and consumers when it comes to the economic concerns of the Commonwealth. And today, that balance is becoming more complex and challenging by the day.

Virginia has been a national leader in data center development, a sector that continues to drive significant economic growth across the commonwealth. But this growth continues to make new challenges every day. Hyperscale power users like data centers place unprecedented demands on our electric grid and utilities. At the same time, the Commission is tasked with

implementing the requirements of the Virginia Clean Economy Act while best protecting consumers who expect reliable and affordable service.

Now, utilities may petition the Commission relief from these requirements if they are concerned that a retiring carbon-emitting facility on the basis that the requirement would threaten reliability or security of electric service to consumers. Above all, our foremost responsibility remains ensuring great reliability for all Virginians. Yet even with these safeguards, the growing demands of large-use retail customers present unique pressures that require thoughtful planning, proactive solutions, and collaboration among all stakeholders.

Today's conference serves as an important step in identifying potential frameworks to address these challenges. I hope today's discussions shed light on the near-term actions we must take to address the impacts of this already expanding load. And as we consider long-term solutions, we cannot lose sight of the urgency of the moment. The load is here, it is being built now, and we must respond accordingly.

Taking years to perfect our approach is not an option. The stakes are too high for Virginia's economy, its energy reliability, and its residents. This is an opportunity to shape a path forward that ensures we meet

today's challenges with foresight, pragmatism, and a shared commitment to the public good.

So I look forward to the insights and ideas that will emerge from today's discussions. Thank you.

COMMISSIONER BAGOT: Thank you, Chair Hudson.

Commissioner Towell?

COMMISSIONER TOWELL: Thank you, Judge Bagot. I would just like to reiterate my colleague's comments and thank everyone who is participating today who has filed pre-filed comments thus far, and to remind everyone who's both in the room and watching via webcast and otherwise that there will be an opportunity to file post-conference comments as well, as we continue to wrestle with this what has been called in the popular press on numerous occasions, A once-in-a-generation challenge and the largest load growth scenario since the conclusion of World War II.

All eyes are very much on Virginia as the home of the largest concentration of data centers and other hyperscale users in the entire world. I believe if you add the second two markets, which I believe at last check were China and I believe Great Britain, they together combine just slightly more than Loudoun County, Virginia. And so the issues that we are wrestling with today and in the days to come are of significant importance, not just

here in Virginia but across at least The United States of America.

I will say that between the time that the General Assembly voted on my election to this job and the time that I came on board, which was roughly a month and a half, it seems that this entire issue arose. And so thanks for that, everybody.

But today is I think a very important day as both the Commission, interested users, customers of all classes and types begin to get a more fuller and comprehensive understanding of not only the challenges but also the opportunities that are afforded the grid based on this most recent and exciting challenge when it comes to both load growth and the use to which our load is being put here in the Commonwealth of Virginia. Thank you all very much.

COMMISSIONER BAGOT: Thank you, Judge Towell. So with that, I'll ask the panelists for the first panel to please take your seats. And I will kick it off to Chair Hudson to get us started with panel 1.

COMMISSIONER HUDSON: Thank you, Judge Bagot.

All right. Good morning. Good morning, everyone. So to kick things off, not all types of load are equal. For data centers, the load profile is rather unique. It's categorized as being very high. There's a

constant demand that remains stable throughout, across all seasons. And when it comes to the forecasting, there's significant forecast uncertainty as projections of future load often lack the confidence of alignment with the actual outcomes.

And so what I'd like to hear from each one of you is how can we currently account for the potentially speculative nature of large-load customers' requests when it comes to system planning?

COMMISSIONER BAGOT: Chair Hudson, I don't want to interrupt your question. Do you mind if we quickly run through some brief introductions --

COMMISSIONER HUDSON: Oh, absolutely.

COMMISSIONER BAGOT: -- of each of the panelists? I apologize.

COMMISSIONER HUDSON: Oh, no problem.

COMMISSIONER BAGOT: So I'll start on my left. And we'll go from left to right. Brief introductions. To the extent you have short opening remarks, please provide them. And then we'll jump into your question.

COMMISSIONER HUDSON: Absolutely.

COMMISSIONER BAGOT: I apologize.

COMMISSIONER HUDSON: Absolutely. I was just so excited. I'm sorry.

MR. KARANDIKAR: Good morning. Chair Hudson,

Distinguished Judges of Virginia State Corporation Commission, thank you. Thank you for the opportunity to speak about the load growth and its impact on the reliability. My name is Gaurav Karandikar. I'm a director of reliability assessment.

THE REPORTER: I'm sorry. This is the court reporter. Can you speak up just a little bit more?

MR. KARANDIKAR: Am I coming through better now?

THE REPORTER: A little bit, yeah. There's a table microphone in front of you or a little to your left.

MR. KARANDIKAR: Oh, okay.

THE REPORTER: Yeah. Thank you.

MR. KARANDIKAR: All right. Thank you.

Once again, my name is Gaurav Karandikar. I'm a director of reliability assessment and technical services at SERC Reliability Corporation. SERC Reliability Corporation is one of the six regional entities work under the delegation agreement with NERC. Our focus, our mission is to assure reduction of efficient and effective reduction of the risk to the bulk power system.

I'm happy to answer any, get any questions. We do have certain documents that we put all forth for our

entities to review. We have over 300 entities that we oversee.

Load growth is an important topic, so important that we actually included that in our latest risk report. The report is posted on our website as well. It's not a siloed topic because it gets influenced by -- SERC in particular, it gets influenced a lot by weather as well because the load is very much dependent on -- we have seen peaks in winter, summer domes as well, which gives rise to this unexpected peaks that come in. And those peaks can be any time of the day. Winters, they're usually in this morning hours, and then the summer, they're usually the evening hour. So definitely have something that we need to focus on.

Also, when we talk about load growth, it -- we're looking from the lens of reliability. It's impacted by what the resource are available on the system. The equation that I always look at myself is there is -- there's a load, there's generation, and there is transmission. If you have enough generation to serve the load where the load is then you've served that. If you don't have that, you definitely need to have enough transmission in order to bring in that generation to the -- where the loads are.

The risk that we see today is that the load in

particular can come onto the system onto the grid within one to three years' time frame. Whereas, when you're looking at the different types of generators, they can vary between anywhere from two to eight years to bring them on to the system, and transmission even takes much longer than that. There is a disconnect between how these loads are forecasted and what timeline they are forecasted in to give the generation and the transmission enough time to build this.

And if we look past those challenges, then there are supply chain issues. So even if you have everything in place, there needs to be a -- there needs to be concerted effort as to how do we get the raw material in order for us to build the things that we are going to build, be it generation or transmission, in order to support those load as well.

And that's about the resource side of things. We also see that there are issues on the operational side of bringing in such a large number of megawatts of loaded in chunks of those loads. We've seen in the Virginia state itself, where a fault actually took out a large amount of load and transferred it elsewhere to get it off the grid. It transferred on to a backup generation. It was about 1,500 megawatts of load.

But as we grow, look into the future, that load

might be a bigger one, which might impact the stability of the grid as well at some point. These loads are not quite -- go through as rigorous process as the generators do. So we don't really have the right load models in order for us to study the impacts or the behavior, the operating behavior, of these loads or how they're going to impact. So that's a gap that we definitely want to work towards and getting better at it.

There's not a process right now in place where we do that. We look at it as any other load, but not as rigorously we do a systems impact and feasibility study than when we do a generator interconnections, for example.

So those are some of the comments. I look forward to answering some of the questions and having discussion with my fellow panelists. Thank you.

COMMISSIONER HUDSON: Thank you.

MR. CHUPKA: Good morning. I'd like to thank the commissioners for convening this conference. It's very important and quite timely. My name is Mark Chupka. I am presenting on behalf of Clean Virginia.

I'm going to address four items very quickly. The first is the load growth forecasts and how certain is that consensus view that seems to be emerging. Next I'll use some numerical examples of the implications of these

forecasts for generation and transmission investments, the implications for meeting environmental targets, and implications for Virginia customer rates.

Looking at load growth in Virginia, it's good to start at the starting point, which is data centers already use over 25 percent of the electricity consumed in Virginia. That's according to the Electric Power Research Institute. Using projected load from the Dominion IRP as an example, we're talking about four percent over the next cumulative annual, annual growth rate between 2024 and 2039. Eight-seven percent of that growth arises from the data center expansion in the load forecast. And by 2039, just the incremental data center load would constitute 30 percent of the forecasted peak and 37 percent of energy consumption.

And, of course, that's not the whole story in Virginia. Actually, the expectation is that 60 percent of the expected data center load growth would occur outside of utility service territories and the co-ops.

Other forecasts are actually closely clustered to the Dominion forecast, the JLARC report, PJM, and others. But consensus does not imply accuracy. Often forecasts of this nature are clustered, not because everyone is in agreement about how the future is going to unfold but rather they're working from the same data or

very similar data using very similar methodologies.

There's a reasonable chance that some transformative technology, like the Google Willow Chip that was announced last week, could radically improve energy efficiency. That is definitely a possibility. Data centers might start to favor other locations. There could be regional resource adequacy concerns that emerge in PJM, for example, and market prices could stifle the market for additional data center growth. Or, of course, actual development might exceed forecasts. And that depends in part on how data centers grow in other regions.

When I look at long-term forecast, I tend to think of that -- of this nature, probably fairly solid for 4 to 7 years because some of that's already baked in, but it's highly uncertain at the 10- to 15-year range. And thus planning for generation and transmission resource development for an uncertain longer term forecast sort of is driving past the headlights of what we can really understand to see.

As my co-panelist mentioned, the time from data center project approval to online dates is shorter than the utility planning cycle, which means that new resources can get out of sync with new data loads. And given the magnitude and the rapidity of data load, so

data center load growth, that could be a problem in the fairly near term.

Just to give an example of financial impact. Looking at Dominion's IRP and the IRP supplement, Dominion expects data center load to increase 15-year system costs by 23 billion in net present value. That's a lot of money. And this arises from new solar, wind, storage, nuclear, and natural gas resources that are needed to meet the incremental load data.

The emissions implication of this, I'll focus on the gas resources, show that just from data center load growth, there would be expected an additional almost three million metric tons of carbon dioxide. Now, what does that mean? That's equivalent to the emissions from roughly 650,000 cars using EPA data, which is about 22 percent of the registered cars in Virginia. This is not just all motor vehicles. It's just looking at passenger automobiles.

The gas that Dominion expects to add through 2039, which also includes, you know, their baseline level of builds, would be the equivalent of -- it's about 7 million metric tons or the equivalent of 1.5 million cars or half of the passenger car fleet that's currently in Virginia. So these are emissions of some magnitude.

So even if Dominion would partially fuel these

with -- these natural gas generating plants with clean hydrogen, as they explored, it would still make it much harder to attain the Virginia clean energy goals for 2045 2050 time frame.

Just turning quickly to cost allocation. Among Bonbright's ratemaking principles, the principle of equity gets the most attention, and that has two components: non-discrimination and fairness. Non-discrimination is trying to answer the question, does the cost allocation or rate design treat customers with similar attributes and circumstances with reasonable similarity?

So the kind of questions here, are all data centers mostly alike among the class of data centers and unlike other loads? Would that require a specialized rate? Or will a generic commercial rate apply to data centers come up with an equitable and non-discriminatory allocation of costs?

The second one is fairness. What is a fair allocation of costs? And this usually means allocating total costs incurred among rate payer classes, such as residential, commercial, industrial, with minimal cross-subsidy. But because rates represent a trade-off between multiple goals, minor cost misallocations between and within customer classes can arise.

So just an example, and this is not based on my perceptions of rates, but it's just an example. So say the cost allocation to data centers were two percent below actual fair and incurred cost share. That is, data center revenues could cover 98 percent of the costs that they incur. However, the overall data center share of costs will rapidly grow. Applied to the 23 billion figure that I cited before for new -- the present value of new costs, over time that would represent about $460 million over time. If data center rates only recovered 95 percent of the costs, then that misallocation would grow to $1.15 billion over time.

Now, I'm not predicting such a misalignment or one that would persist over time. I am aware of the analysis in the JLARC report that showed that data centers are covering their costs. And I have no reason to question that finding. However, given the magnitude and rapidity of data center load growth, I believe the continued vigilance by this Commission will be needed to keep rates in line with actual costs incurring.

We are no longer in a business-as-usual circumstance. And so I think the -- this technical conference is a really important step to help understand -- to understand the source of this load growth and to explore ways to ensure that Virginia

customers are held harmless, the residential customers in particular, from the data center load growth and rate payer effects. Thank you.

MR. TINJUM: Good morning, Your Honors. On behalf of the Data Center Coalition, DCC, thank you for convening this commissioner-led technical conference and providing the opportunity to participate in this important discussion. My name is Aaron Tinjum. I am DCC's Director of Energy Policy and Regulatory Affairs.

DCC is the national membership organization for the U.S. data center industry. We currently represent 33 leading data center owners and operators that maintain data center infrastructure and employees across the country. Our member companies are providing digital infrastructure that enables the applications, capabilities, and services that support the modern economy, including cloud computing and artificial intelligence. And the vast majority of our membership companies have infrastructure teams and operations in the Commonwealth of Virginia.

We're here today to talk about the unprecedented growth of the industry and the significant electricity consumption that comes with data center development. From our members' perspective, there is unprecedented demand for the digital services that have

become central to our daily lives and modern economy. Everything from the way we work and learn to how we buy groceries, bank, and even access medical care now occurs online. And Deloitte tells us that on average, U.S. households now have 21 connected devices. With that growth in number of devices generating and consuming data, the role of data centers is expected to grow, and consumers and businesses will generate twice as much data in the next five years as they did in the past decade, so twice the amount of data in half the time.

This growth is driven by the widespread adoption of cloud services, the proliferation of connected devices, and the rapid scaling of advanced technologies like generative AI, which alone could create between $2.6 trillion and $4.4 trillion in economic value globally by 2030.

After nearly two decades of relatively flat electricity consumption, the U.S. is experiencing a significant increase in power demand driven by several economic growth trends, including data centers. But in other pockets of the country, certainly onshoring of new manufacturing, widespread building vehicle electrification, hydrogen fuel production are all contributing to load growth. Supporting each of these demand drivers and this growing demand generally through

timely and prudent investments in new generation, transmission, and distribution infrastructure is essential to the nation's and Virginia's economic growth, as well as our global competitiveness and national security.

As the world's leading data center market, Virginia is uniquely positioned to create a model that advances the clean energy transition, supports continued economic development, and importantly, protects customers from any unnecessary costs. DCC and its member companies fully recognize there are significant challenges associated with load growth, and we are committed to working collaboratively with the Commission, utilities, and other key stakeholders to develop solutions that advance a cleaner, affordable, reliable, and resilient electricity grid for all Virginians.

Just to touch briefly on a few of the points I outlined in my written opening remarks, we should not lose sight of the fact of the industry is a key driver of economic growth within Virginia. Data centers create employment opportunities for Virginians not only at data centers, but they're also catalysts for broader economic growth, supporting ecosystems of suppliers, of service providers, of construction workers, and enhancing the industry's impact on local and national economies.

One data point related to this is the industry's total annual impact in Virginia increased by 19 percent between 2017 and 2021 to 86,290 jobs. It generates significant local and state tax revenue, and the total industry impact on GDP in Virginia grew from 8.9 billion in 2017 to 13.5 billion in 2021, which was a 52 percent increase over a four-year period. So while the industry's electricity consumption certainly has grown and will continue to grow, the industry's economic benefits for the commonwealth have also grown.

Another point I'd like to emphasize here today is that while we certainly focus, rightfully so, on the industry's growth and electricity's consumption, what's often lost in the discussion is that these are highly efficient facilities, that they enable efficiency gains economy-wide, and that the companies building these facilities have been helping drive grid decarbonization in the clean energy transition. When we think back to how we've got into the day with these larger data center facilities, it really came out of a need for greater efficiency and security of our computing. By centralizing computing resources, data centers have been able to leverage innovations in design, in equipment, and technology to maximize energy efficiency.

Lawrence Berkeley National Lab found that while

electricity consumption at data centers rose 6 percent from 2010 to 2018, our computing output at data centers jumped 550 percent during that same time frame, marking some very significant gains in efficiency and productivity. Moreover, our member companies and data centers as an industry are committed and naturally incentivized to keep pursuing efficiency as energy marks the largest annual operating item in many of their budgets.

Beyond efficiency, our members are enabling efficiencies economy-wide many of the technologies and strategies deployed across Virginia and the country. We think about smart thermostats, demand response enabled by smart thermostats, smart meters, managed electric vehicle charging, smart lighting, and increasingly grid-enhancing technologies. Those innovations that will help us optimize and maximize our grid capacity will also require the digital infrastructure provided by data centers. So we cannot simply just view them as large consumers of electricity if they are also facilitating the efficiency gains and energy savings for homes, businesses, industrial consumers, and even utilities.

Beyond efficiency, leading data center owners and operators are driving advances in clean energy and are now driving half of all contracted corporate

renewable energy in the U.S.

Some of the issues outlined in the Commission's notice include load forecasting. DCC believes that is extremely important at this moment of a load growth to ensure greater communication, collaboration, and transparency, especially with load forecasting among utilities, regulators, customers, and other stakeholders. Enhanced transparency and forecasting, interconnection processes, and scenario planning can help ensure that we're not only developing the right infrastructure, but that we're also protecting customers from any inefficiencies and unnecessary costs in the process.

We are supportive of opportunities to reduce costs, maximize capacity in right-size investments through grid-enhancing technologies such as dynamic line ratings, advanced reconductoring, and other capacity-enhancing solutions. We're also supportive of exploring the development of well-structured voluntary demand response programs that properly allocate risk, incentivize reward participation, and allow customers to meet their sustainability commitments.

I do want to emphasize today that DCC-member companies are committed to paying their full share of generation distribution and transmission costs. I think it's also important to dig into what data centers

routinely pay for today, including infrastructure directly associated with serving data centers, including breakers, transformers, entire transfer substations, and supporting infrastructure. With Dominion Energy, data centers also pay certain pre-connection costs, connection costs, and additional facility costs to provide appropriate assurances to the utility and help protect other customers from the risk of stranded infrastructure.

Furthermore, there has been much discussion over whether current cost allocation practices are sufficient, and it indeed is part of the reason we're here today. Dominion has also reported that since 2020, residential customers' share of transmission costs have declined by 10 percent, while data centers and other customers' allocation have increased by 10 percent. And the data centers in the Virginia report released last week, the Joint Legislative Audit and Review Commission, JLARC, found that Virginia's current rate structures appropriately allocate across customers.

As the report states, JLARC staff commissioned an independent study of electric utility cost recoveries under current rate structures to see if the data center industry is paying its share of current costs. The study found that current rates appropriately allocate costs to the customers responsible for incurring them, including

data center customers. And while the report emphasizes a need to continue reviewing current practices and consider alternative approaches as system growth continues, which is part of our focus here today, it should not be lost that existing cost allocation and rate review practices have worked to date.

But looking forward, it is critical to ensure that rates are fair and equitable for all customers. It is DCC's belief that is best achieved through the application of and adherence to the sound ratemaking principles that have served Virginia and other jurisdictions well in both periods of load growth and flat electricity demand. As my fellow panelist mentioned, the Bonbright Principles of which include non-discrimination. No customer, industry, or class should be singled out for differential rate treatment unless such distinctions are backed by verifiable cost-based reasoning.

Cost causation. Customer rates should reflect the actual cost of service. The ratemaking process should ensure that incremental costs are fairly attributed to the loads or customers they impact. Limiting cross-subsidization rates should avoid creating unfair subsidies between customer groups and loads. And importantly, transparency. The ratemaking process should

be open and accessible, providing customers with the necessary information and a clear understanding of how rates are determined.

We believe the Commission should continue to routinely examine cost allocations and the corresponding rate designs at this moment of load growth to ensure they're fair and reasonable and justice is done in biannual review proceedings and Rider T1 proceedings. We do believe any determinations related to tariff structures or cost allocation or deep analysis of those are best suited for those proceedings where costs and allocation of such costs can be thoroughly reviewed by the Commission and other stakeholders. And for our part, DCC is committed to engaging in the proceedings to be as helpful on behalf of the data center industry as we can.

But we again thank the Commission for convening this important discussion. Look forward to the discussion today. And of course, continued collaboration with the Commission, utilities, and other stakeholders to ensure that growing demand for digital services is met with innovative, reliable, and sustainable energy solutions in Virginia. Thank you.

COMMISSIONER BAGOT: Thank you.

Mr. Blackwell?

MR. BLACKWELL: Good morning. Thank you for

hosting this technical conference and allowing me to have the opportunity to speak. My name is Stan Blackwell, and I'm the director of Dominion Energy's data center practice.

And so I'll make five brief points, first about our data center forecast. It's a very robust process that uses over 10 years of monthly metered customer data. So every data center on our system, we have the information, from the point they've been connected out to today, to help model the behavior. And that's the foundation of our forecast and we believe lends to a very high level of accuracy. We start with statistics, use customer-provided information and market information to then make a decision, is this customer's behavior, the way they've behaved in the past, going to continue into the future? And that's how we go about building our forecast. And we can certainly talk in more details about it.

One of the questions you often hear about forecasting is, Well, is this a type of technology that's just going to go away and soon? So, you know, you're going to build a bunch of material. And I would point you to the simple television set. It's been around since the '50s. Cathode ray tubes. Now go into a big-box store and you can't spell half the technology on a TV.

It's still here.

And what you find in forecasting data centers is you have a technology that gets hot and it matures. 5G came in, Internet of Things. The most recent one -- well, and then during COVID, we had -- everybody went to virtual streaming. So you kind of maxed out that. And now we have AI. These technologies continue to drive this industry. Perhaps virtual reality is the next driver, perhaps self-driving vehicles. You don't know as technology develops. All we know is it will continue to develop and the data center is the engine, I guess, that's hosting these particular technologies. So we believe the growth will continue out into the future.

We don't actually use customer contracts to develop our forecast. We use customer contracts to validate it. And we have signed firm contracts. That's either a electric service agreement, which means we have a meter set, or a construction contract that says, I'm going to build you infrastructure. And we have signed contracts, those firm contracts that support our forecast out through 2040.

And that's as in of -- what we have in hand today. And so what I would tell you is we have a good forecast, a great forecast process. I think the judge -- or commissioner earlier talked about it. We can

add more about how -- a little more detail how we go about doing the forecast.

My second point is that there are two things when you're planning for big infrastructure: transmission planning and generation planning. Our forecast, the way PJM does it, is they ask all of the utilities in the Dom zone -- the co-ops, us -- they ask us to submit block load adjustments. So we prepare a data center forecast. They ask for a 20-year forecast. So we prepare a 20-year forecast, provide it to PJM to inform their forecast. They roll it through their process and machines. And they return to us a Dom zone forecast. That is the transmission zone that Dominion Energy owns and operates.

So that becomes the foundation, then, of the transmission plan. When we get that official Dom zone forecast, we extract out Dominion Energy's retail portion, and that becomes the foundation of the integrated resource plan. My point is, those two processes are in sync, and they use the same forecast for all loads, including data centers.

Third point I'd like to make is that with the advent of data centers and load growth from a lot of sectors, you need an all-in approach to generation. With the unprecedented demand growth, inclusive of data

centers, we have to balance and harmonize the requirements of the Virginia Clean Economy Act and the paramount need for reliability and affordability for all customers.

The trick to that balance is data centers have very steady 24/7 load growth. They run consistently all the time. Renewable resources in the Virginia Clean Economy Act are intermittent. They come and go, depending on the weather. And so you need a balance. They both have -- renewables have a place in the generation stack. They're one part of the solution. We need an all-of-the-above approach to help meet this growing load growth.

The fourth point I'll make is this -- some of the opening statements were about tariffs and how you assign costs. But as a utility, when you're building large infrastructure that we are for these, whether it's a data center or a large industrial plant, it's a four- to seven-year process to build this and bring it online because you're building transmission, you're building substations and putting a lot of big equipment in there.

And so what we do is we have a four-step process that we use for contracting purposes to weed out speculative projects. And it requires substantial

deposits and commitments on behalf of the customer before we'll ever start building something. And that's how you -- one way you eliminate speculative projects. When you sign and you make a commitment, we'll build the infrastructure required to serve you, and it has requirements in there.

And so I will say again of this process, and we can talk -- this four-step process for contracting, from July of '23 to July of '24, we signed over 6,000 megawatts of firm contracts in one year, again to support the forecast that we're putting out. The customers are signing those contracts.

The last point I will make is two things about JLARC. JLARC, there's always a question about somebody independently forecasting data center business. If you look at maybe page 26 of the JLARC report, if I remember correctly, they essentially forecast the same forecast that Dominion was forecasting. It's not exact, would never expect it, but it's an independent validation of the forecast that we prepare.

And then finally, I believe JLARC also identified the need for an all-in generation approach. So I look forward to answering questions. Thank you.

COMMISSIONER BAGOT: Thank you.

MR. HEWA: Good morning, Commissioners. I'm

John Hewa, the president and CEO of Rappahannock Electric Cooperative and the CEO of our affiliate, Hyperscale Energy Services. Let me first say I just greatly appreciate the Commission and its staff taking the time and the opportunity to bring these technical proceedings together. And I'm looking forward to hearing from the other panelists throughout the day. Thank you for bringing this focus to this topic and now.

My comments will be around the rural electric cooperative perspective and more of the retail distribution perspective. A scenario that I hope you will recall and remember and take away from my comments today: Under conditions, market conditions, like we experienced in Winter Storm Elliot, REC's wholesale market settlements for its planned data centers in two weeks or less could exceed the rest of the cooperative's annual power bill. And I want to just put an exclamation point behind the scale.

Serving large data centers represents one of the most significant opportunities and challenges here clearly within the commonwealth. Today I hope to convey a few things from the cooperative perspective. First, the cooperative can-do attitude and size up this opportunity and challenge. Second, explain Rappahannock Electric as an example of one co-op's story. Third,

discuss some problem areas around cost, scale, volatility. And then conclude finally with some business protections and the concepts around REC's affiliate model.

As you may know, Virginia has 13 highly collaborative electric distribution cooperatives. Each, however, has its -- very much his own uniqueness and brings forward its own unique business challenges. As member-owned non-profit utilities, electric co-ops certainly occupy and feel a very unique place in Virginia's energy landscape

Our goal is and remains to provide safe, reliable, affordable, and sustainable power to our membership. We've done this successfully for decades, and now we are working to extend this same quality service to our emerging data center members. REC is a 22-county electric distribution cooperative serving just over 180,000 accounts. And in the context of today's discussion, we're focused on protecting not only in getting the needs for our new data centers but protecting the traditional and the native members, if you will, from the financial risk associated with effectively serving these large loads and ensuring also that the data centers don't cause any type of operating or financial harm to each other with respect to their power bill.

Large-use customers such as data centers have emerged as a major economic driving force in the commonwealth, and their presence is increasingly concentrated in rural cooperative territory, as was previously noted. Access to land and the transmission corridors is attainable, and that is part of that driving force.

These customers and our future members offer significant economic benefits including job creation, infrastructure investment, increased tax revenues that can transform, in a very beneficial way, local economies and foster economic growth. These projects are extremely and vitally important to our counties. And I would consider them to be landmark projects at a landmark moment. And I want the commissioners to understand how enthusiastic and confident I am in the electric cooperative ability to successfully serve these large-scale data centers.

So after 85 years of history of REC's operations, our all-time peak demand occurred during the cold morning of Winter Storm Elliot in December 2022 at a system peak of just over 1,135 megawatts. This achievement was reliably supported through the energy services of Old Dominion Electric Co-op, ODEC, and transmission owners and operators such as Dominion Energy

as well.

Today, REC's local distribution grid has over 18,000 miles of infrastructure and only a few instances of what I would consider to be direct-serve facilities. I'll focus a bit more on that in a moment.

So our general membership is served through multiuse infrastructure traversing through our counties and towns and rural areas. Our co-op is expected to add some 4,000 new residential and commercial accounts alone next year. However, alongside this traditional growth, in the last 24 months, we've engaged with a wave of new data center members and emerging direct-serve projects with an inbound load ramp projection that climbs in excess of 16,700 megawatts by the year 2040.

Commissioners, what I'm characterizing here is that a once quieter and still rural electric cooperative has an inbound load ramp that exceeds the summer peak of the New York City Power Control Zone, actually substantially. In REC's case, much of this load ramp is scheduled to mature quickly within the next five years. And the limiting factors there, at this moment, tend to be supply chain on delivery of transformers and 230 kV breakers, 230,000-volt breakers, as well as just construction timelines. But we are designing and building to the requested spec of the data center member

with respect to the load ramp they have requested.

REC is and will serve each of these data centers with direct-serve facilities paid for by the data centers. We work closely with transmission owners such as Dominion Energy, and we very much appreciate that partnership in bringing transmission service to each project or campus. These large customers and co-op territories are not only choosing rural Virginia to support their global operations, but they're becoming much larger in scale and their energy requirements.

Prior to this wave, I would characterize our largest member customer under 50 megawatts. For example, to date, REC already has 26 large-scale power transformers on order, which represent nearly 3,900 megawatts of future connected infrastructure. Each project, again, the data centers are pre-paying for the design, the infrastructure, and the construction.

REC's emerging data center members range from a minimum of approximately 150 megawatts at maturity and build out to multi thousand megawatt at build out. They truly are -- these truly are hyperscale projects, hence the need for Hyperscale Energy Services, our affiliate which I'll discuss a moment later.

Virginia has enjoyed and continues to enjoy the benefit of being in the PJM structured market. This

robust market has been overall predictable, reliable, and affordable, I believe a large part of what continues to attract data centers to Virginia. Now, thinking of co-ops, as we add these large multi thousand megawatt loads, it is important to put scale in context. And REC is a large co-op by virtually every measure.

However, as the loads of these large members increases, so does the need to cover all financial scenarios completely or absolutely. In our business, when a residential or commercial account fails to pay their electric consumption, all of the other co-op members share that obligation. We work to hold this to a minimum, but it is a reality of being a utility provider.

In 2023, the PJM market monitor reported the average cost of power in PJM was around $53.42 per megawatt hour. Incidentally, the year prior, it was nearly double. So a thousand-megawatt data center in this normal $53-megawatt-hour market might represent a weekly settlement of over $6.5 million. That's weekly.

If only half of the 16,000-megawatt load ramp that I've characterized and provided in my pre-filed comments, if only half of that builds, we could see that clear in a normal market at 50, 5-0, 50 million in a typical or normal market per week. This is introducing a -- clearly introducing a new scale. These risks must

be managed carefully to avoid unintended financial burdens on co-op member consumers and the cooperatives themselves. Without safeguards, the potential for cost shifts from large customers to existing cooperative members could undermine the financial stability of cooperatives and quickly erode member trust.

Now, what I've described to this point is a -- our typical scenarios in a typical market and not necessarily reflective of the concerns that PJM has already reported about the potential for declining reserves. Market volatility, I believe, will continue to be -- is and will continue to be a part of the market that we operate in. And this potential for volatility introduces a more acute situation.

For instance, the average price of a wholesale electricity for the week in our area of Winter Storm Elliot was approximately four times higher than a normal market. So that weekly settlement now for a thousand-megawatt data center climbs to 26 to 28 million. And again, if just half of the REC existing portfolio we're working on builds out, it could exceed $200 million in a week. REC's annual budget for the other 180,000 accounts that it serves, put together, is $350 million per year. Per year.

So again, under stressed market conditions,

weekly or multi weekly settlements could begin to rival the co-op's annual power bill. So rather than running through countless other examples, I believe it's appropriate at this point to say that there are scenarios that are difficult or maybe impossible to predict, and that the continuity of the utility's ability to operate its business could hang in the balance of one or several large-scale members paying or not paying their power bill. The scenario of a data center bankruptcy, for example, could represent a long, protracted exposure for an electric cooperative well into the tens of millions of dollars. A billing dispute or the implications of some type of prohibiting emergency order could also create similar circumstances with large, open-ended calculations around doubtful receivables.

I simply do not think it is right for the other members, such as residential, to have to backstop the scenario for a Virginia-based data center operating with global reach. These large-use members must provide the financial liquidity not only for their own grid infrastructure and operations but also for backing their presence in the wholesale market and the wholesale market purchases that go with that.

Now, moving just a bit more into some business protections. It is very important that utilities retain

the right to serve large-use customers with Market-Based Rates, or MBRs. MBRs allow utilities to price electricity competitively based on market conditions, ensuring that large-use customers contribute equitably to the cost of their service. And when done correctly, this approach protects other member consumers from subsidizing the significant energy demands of these facilities. This approach also ensures that the costs associated with serving these customers, such as energy capacity and transmission, are fairly allocated and do not impact traditional cooperative members. This principle is crucial to protecting the cooperative model and ensuring equitable treatment for all members.

So to this point, I've characterized a few areas of the problem and certain solutions. First, the magnitude of the data center energy needs in comparison to even a large co-op. Second, the potential for a non-payment scenario for any reason to greatly impact -- potentially greatly impact the other cooperative members, including other data centers. And third, some of the protections needed to ensure business continuity for electric cooperatives, even through times of potential market volatility.

I'd like to spend just a few final moments here discussing REC's affiliate model solutions and concepts.

Hyperscale Energy Services is a wholly owned affiliate of REC, created to provide market power, billing, and credit monitoring services for large-scale data centers in our territory. Because reliable and affordable electricity is essential to meeting the needs of all co-op members and this unprecedented size for data centers poses some new risks for liquidity and cost recovery, REC is pursuing a thoughtful business structure through the use of our affiliate, Hyperscale Energy.

The introduction of an affiliate, and in our case, a series of affiliates, is to allow for clearer separation of the energy revenues, the payment, and especially credit responsibilities to maintain operations in the market and to do this on a one-to-one basis with these large loads. REC now plans to employ Hyperscale and its sub affiliates, Hyperscale 1, 2, 3, et cetera, in a wholesale model to serve as off takers of PJM Power that is then passed through the co-op and to the individual data centers. This model, in fact, aligns cost fairly and partially protects REC's members from any potential egregious non-payment.

Together REC and Hyperscale as our affiliate are confident, as are other co-ops, we can get the job done and get it done with the right business model and prudent financial protections.

Commissioners, as I reach the close of my comments, I want to thank you again for this opportunity to be before the Commission and characterize both the opportunity and challenge ahead of us. I am extremely grateful and appreciative of the Commission's attention in this area. Cooperatives stand ready to do our part and to meet the goals of our counties and the commonwealth. I reiterate how enthusiastic and confident we are in our ability to serve these data centers. And this zeal and can-do attitude is shared by all of the fellow co-ops in Virginia.

I applaud the Commission and its aim to help us get this job done, to protect our member consumers, and to keep Virginia on top for business as a world leader in supporting data centers with global reach. Thank you.

COMMISSIONER BAGOT: Thank you. Thank you all for your opening remarks. I'm going to pass it back to Chair Hudson. And unless you all have a much better memory than I do, I'm going to ask him to repeat his initial question for you all.

COMMISSIONER HUDSON: Thank you, everyone. And thank you for your presentations. They were really helpful and extremely informative.

Mark, one of the things that really resonated for me in your opening remarks was talking about data

centers and how they can move to other locations. And I'm assuming that they move -- or they may relocate because of great reliability, pricing, or other economic conditions that may be unfavorable.

And so what I'd like to ask the panel to kind of circle back to my original question about uncertainty, how do we deal with the speculative nature of load customer requests and system planning? And I know that Aaron and Stan kind of talked a little bit more about that, but I'd like to hear from others on how to deal with the speculative nature of that.

MR. CHUPKA: Yeah, I'd like to just quickly respond. I didn't mean to leave the impression that data center loads themselves could move once built there. They're not terribly portable. But conditions in Texas, for example, in ERCOT, might be at some period of time more favorable, just from a wholesale market perspective, than PJM. And that will impact, you know, how many data centers locate in the PJM region.

And I'm not saying that you have to forecast all of the regions and allocate data centers among various candidate locations. But these are markets that are very broad. And so what Virginia -- and the past may not be prologue in terms of what Virginia has experienced as being the preeminent market location. Certainly, that

looks to continue in the near term. I think that's pretty reasonable.

But in the longer-term data center, you know, those who own and operate data centers may find other markets more attractive than Virginia or than PJM. So I just wanted to clarify that.

COMMISSIONER HUDSON: Of course. Thank you.

John? Yes.

MR. HEWA: Yes. Thank you, Commissioners. I would just, you know, reiterate: Virginia has been the top state -- the CNBC top state for business in three of the last five years. And a great deal of that is attributed to the tremendous investment of the data centers. There are many other investments occurring in the commonwealth, but this is clearly a very, very strong driving force.

And from a energy pricing perspective, I do believe it is a serious issue. We need to make sure that Virginia, within PJM, can remain very competitive, especially relative to its other top competitor states, which may or may not have similar requirements. Thank you.

COMMISSIONER HUDSON: Thank you.

MR. BLACKWELL: So the question becomes, is it speculative or is it duplicative, meaning you're

developing a project in Virginia or a project in Texas, and you're going to pick one. So we get that question. Or are there multiple companies inside Virginia competing for the same business? And so you handle those problems a little bit differently.

Let's say we have 20 data centers competing for one big cloud contract. What typically happens is a utility will get 20 very large requests, say they're 300 megawatts a piece. So I've got 6,000 megawatts of request for one cloud contract. That's a 300-megawatt contract.

The way we handle that at Dominion Energy Virginia is we again have 10 years a meter data. We forecast our seven largest or fastest growing companies. As in any industry, you have a very small number of very large players. We certainly have that in our service territory. So we forecast those seven customers discreetly. We know how they behave. We know how they've been behaving for the last 10 years, and we look internally, do we still have projects being developed? Is there bad press in the news financially about them?

And we look at that to inform our decision. This is how they behaved in the past. They're going to behave this way in the future or not. The way you eliminate, back to my example, of 20 firms competing for

one contract is, we have at any one time 50 discrete data center companies in our service territory. So we model 7 discreetly, and the other 43 we model them together. We're not trying to pick which company's going to be the winner of that contract, in my example. We know one is going to win. What we're doing is forecasting how that load is going to show up on the system.

And that's how you eliminate duplicative projects because you're not forecasting all 43 are going to win. You're saying one's going to win and how is that load going to grow? So that's how we, from a forecasting standpoint, eliminate duplicative -- we at any one time have 40 to 50 gigawatts' worth of capacity request. But we know that's not what our forecast is going to be because they're all competing for business.

How you eliminate speculative projects goes back down to contracting. Everybody wants their project to go until you say, sign this contract. We start with an electric -- a engineering study, requires a $250,000 deposit. If you want us to do a six- to nine-month study on your project, write a check, and if your project doesn't go through, we'll net the time charging we spent against that and refund the balance.

So that slowly eliminates the really speculative projects. Why do I want to spend $250,000?

So we do engineering studies. We render you six to nine months later, here's what I'm going to build 230,000kV transmission lines. A substation, just say the cost of that's $100 million. Just say that's the number. Sign this contract. It commits you to reimburse the -- Dominion Energy of Virginia if you cancel the project. So if we put $50 million in the ground, we've not connected a meter yet and you back out, you're responsible to reimburse us for any money spent.

And to date we've not had anybody cancel a construction contract, to date. That contract requires deposits. The biggest, most expensive piece of equipment in a data center, connector transformers, they can be just say $3 million a piece. You're typically putting in four to five transformers depending on the size of the facility.

And so we require very similar -- what I heard John say, we're saying, I have to remit to the supplier of transformers a third of that cost of that transformer three years in a row. So I require that of the customer. You're responsible to give us a deposit. We'll hold it as your projects in flight. And prior to energization -- or after energization, we'll refund that deposit money. And the point of this is, that customer has skin in the game while you're building

infrastructure.

The last thing in that construction contract is it requires you to set a meter. And once you set a meter, that's the regulations on your terms and conditions, how you render service, the tariffs, and all of that. And so we eliminate speculative projects that way. Contractually, the folks that are serious will proceed on. And that's the way we do it. I believe a lot of our co-op partners do the same.

So I hit two points: you have to eliminate duplicative projects -- they're developing here, there, everywhere -- and speculative projects. And that's how we go about it within Dominion Energy.

COMMISSIONER HUDSON: Thank you.

Yes, John?

MR. HEWA: Yes. Thank you. I can just -- from the distribution cooperative perspective, very similar to what Mr. Blackwell's saying. We start with a letter of application, and that involves an application fee, which is approximately $168,000 for every 300 MVA. And we use 300 MVA as a -- of kind of a compatibility with Dominion. And that's -- our typical substation is a 300 megawatt or a 300 MVA station.

And as Mr. Blackwell explained, after that occurs, we tend to work with the transmission owner,

which is in many cases Dominion Energy, on that transmission engineering study. But at that moment, the customer or our future member has already invested more than a couple of $100,000 potentially and especially for larger scale projects.

The real, very large kind of kickoff or onset of the actual commitment, the true commitment for us is in something we call a CDA or a Construction Development Agreement. And that basically breaks the project into kind of sections of payment. And once those CDAs, the construction development agreements, are executed, we tend to see substantial dollars transacted in the nature of tens of millions of dollars to begin to go out and order those early lead-time equipment, which incidentally, we've seen transformers at 150 weeks or more. We've seen those 230,000-volt circuit breakers out at 180 or -90 weeks in some cases. So those are very, very long lead times.

And going back into what Mr. Blackwell kind of explained, some of it, if it's a speculative site, maybe them -- maybe the customer positioning themselves for what they can do three or four years out. The other two things I would just add to this is that our projects are -- generally, what we tend to see are that a campus is phased with a phase one, phase two, phase three

approach, which helps moderate some of the near-term commitments versus long-term scale.

And then lastly, even though we may have a signed construction development agreement, one of the things that we have to work through is to secure the transmission build, in this case that Dominion might be extending transmission facilities. It's very important for us to work with that member who is causing that build for us to secure that so that the project does in fact get in service and meets Dominion's requirements. Thank you.

COMMISSIONER HUDSON: That's an excellent point, John, and about construction and transmission build. And one thing I did not hear from the panel and I like to hear from anyone if they have a response is the issue of possibly overbuilding or under building.

Are there any concerns about that? And if so, what are some mechanisms that are -- that we should put in place to avoid that?

MR. TINJUM: Yeah, that's another great question. And I would just start by stating, you know, DCC is engaging nationally with utilities and commissions across the country. And we often get some form of the question of, is the growth real? Is it speculative?

What we often point to are the tailwinds and

fundamentals behind the industry. So I mentioned in my opening remarks that on average, households now have 21 connected devices. Average household broadband consumption has doubled between 2018 to 2023. In terms of construction spending, for the first time, the U.S. Census Bureau has started breaking out data center construction spending, Put In Place spending as a subcategory.

Around May of 2022, that was around $11 billion nationally. May of this year, it was around $27 billion. Year over year, that was a 69 percent increase. And so when we talk about, is the load real, you know, is there money behind it, the construction spending is one such metric that really gets at that the load is generally manifesting.

I also mentioned in my opening remarks the need for greater communication, collaboration, and transparency at this moment of load growth and recognize that can sound like shallow platitudes until you really apply them to certain practices. I think forecasting is certainly one of those, and it's one of those areas that DCC as a membership, our individual member companies are looking for opportunities of how we can be helpful in that regard. What type of information would be helpful to the utility, to commissioners, to other stakeholders

in understanding whether specific load requests are real.

From our vantage, it would be helpful to really understand holistically what the utility is seeing in terms of load requests, and Mr. Blackwell has helped really kind of highlight how Dominion handles this, what they take for assurances, what gets baked into the load forecast, and what still has additional hurdles to clear.

But we're looking for that communication, is there an opportunity for a feedback loop for the data center industry to provide perspective? Are there opportunities for collaboration? And is there just ways to ensure greater transparency that of course, you know, protects individual customers and competitive projects but still gets assurances to the utility, to the Commission, and other stakeholders that are needed at this important moment.

COMMISSIONER BAGOT: Thank you. So I had a follow-up question related to the discussion on forecasting and the processes you all use to sort of address the two different types of potential issues, which was the duplicative load and then the speculative load. So I want to focus on the speculative load a little bit. And I appreciate the explanation of the process you use and a way to sort of get, you know, companies to have some skin in the game, which may

address some of the speculative concerns.

I can't help but think of our current interconnection queue process and the issues that we're seeing there, where we have a lot of projects in the queue, we have a process for studying and evaluating these projects. There's always a question of whether the project is real or speculative. And so the solutions that have been crafted to resolve this are sort of a similar process where you submit an application, and as you go through the study process, additional payments or forms of security or other demonstrations of realness are being provided. But we obviously still see inefficiencies there, and we see even when you get through that whole process, projects don't materialize.

And so my first question is, is that -- are the current requirements that we have to address the speculative nature of these projects sufficient, given that over the last 10 years, we may have experienced one thing, but it may become more competitive or we may see a greater degree of change going forward? Do we need to start thinking about whether there are additional metrics we could put in place to ensure that these projects are, you know, real?

The other piece of that is, to what degree of -- I don't have a better word. To what degree of

realness are we talking, right? So if we put -- if a request comes in and we go through this process and they put money down, how do we account for the amount of load that they're requesting? And is that subject to change? And based on your experience, is that something that we see fluctuate over time as an entity goes through the process?

My very last question, which I'll ram on top of it is, which relates back to the interconnection queue process, are there time frames on the part of the data center with respect to these commitments as they go through this process? My thinking there is, is it possible, like we see in the interconnection queue process, that as they make their way through this process, there's ways to delay, there's ways to pause, there's ways to have the process sort of be protracted out so that we have this load that's out there that we're now accounting for but that isn't coming to fruition for a long period of time. And then behind it in the queue, we're sort of stacking.

So that's my bucket of questions related to forecasting. And I appreciate all your thoughts on those.

MR. BLACKWELL: So I believe the queue you're speaking of is the PJM generation queue. Is that

correct?

COMMISSIONER BAGOT: Yes. Not PJM specifically, but that is one of the interconnection queues, yes.

MR. BLACKWELL: Yeah, so the way at Dominion Energy we handle that so we don't have a similar thing is we have migrated to a time frame. If you ask us to do a engineering study, takes us four to -- or six to nine months we render you the options, we have had in the past where that particular company would go then say, I've got a study, and try to find an end user. And so we kept wondering, when are they going to show up, you know, what's the time frame?

And so we have since put time stamps on there. The demand is so high, once we render an engineering study, we're saying you have 90 days to progress to a construction contract. And if you don't progress -- given the massive amount of demand and requests we have, if you don't progress, you go back to the beginning of the queue.

Now, it kind of self corrects. Because of the significant demand we're seeing on the system, you go back into the queue, that engineering study is no longer valid because when we get back to your project again, the whole configuration of the transmission system has

changed. And so that's not how the generation queue works to my knowledge, but that's how we're handling projects. You're telling me you're serious. Here's your results. Let's move forward.

And so that's how we manage the queue, for lack of a better term, to get to a construction contract, which is where ultimately, you're building infrastructure.

I think your second question was, well, do you get in the queue and then they change their loads? And that does happen. And if they increase it, you go back to the beginning of the engineering process because you're typically requiring a lot more infrastructure, the larger it gets. And if they substantially lower it, you have to go back to the engineering queue because you may no longer build transmission.

And so it works kind of the same way. You were the next in line, and then we call you and say, okay, I'm ready to do engineering. Well, well, change this number. And so it slows the process down.

And speed to market, I think Mr. Tinjum said speed to market is very paramount to the industry. And so we try to say, here's the process, here's the timeline that you're going to have to make decisions. And those folks that are serious and not speculative, will progress

through the contracting process.

Did that answer your question?

COMMISSIONER BAGOT: Yes, it did. Thank you.

MR. BLACKWELL: Thank you.

COMMISSIONER TOWELL: Mr. Blackwell, can I just follow up briefly on that and piggyback a bit off of my colleague's question? You said that Dominion Energy of Virginia has a lot of data on these processes going about -- going back about 10 years with respect to data centers. But as we've heard from some folks here and then some of the pre-file comments that today's data centers are very different than yesterday's data centers when it comes to load. If that is the case -- and you've done, I think, a very good job of outlining how Dominion deals with requests in the queue today, involving today's data centers, and we've also heard from Mr. Chupka that that forecast is probably pretty robust for the near term because you have individual companies that are, as you have said, putting their skin in the game.

But when you get out seven, nine years with forecasting, how does the company wrestle with the forecasting over a longer period of time when you don't have the same kind of data on the immediacy of the projects and the changing character of data centers going forward based on AI and other uses of those data centers?

MR. BLACKWELL: So the change we've seen over the last 10 years with data center operators, and Mr. Tinjum can supplement this, is the size of the building. So if you look eight years ago, our -- in Virginia, our typical big data center was a 25-megawatt building. Couple years later, that became a 45-megawatt building, went to 60, and we're specking 90-megawatt-plus buildings today. And in fact, the industry is moving towards big campuses where you're putting multiple buildings on there.

So the nature or change is the size of the building, if you will. Along those lines, the technology going in those buildings, back to my TV analogy, has changed. Everybody has a navigation software that you use now when you drive. Everybody's using virtual meetings. And so all of the -- every time a new technology is developed, it goes in a data center and adds to what that processes. And so that's another change that you find in the data centers.

The PJM processes asked us to forecast 20 years. We have very near-term, very high-level accuracy. Our eight-year average is under one percent -- our variance is one percent, eight-year average, on about 3,600 megawatts of data center load today on the meter. And so it works very, very well in the short term. It

will not be as tight as we go out.

And so the way we address that at Dominion, I -- some of our other partners do, we do scenario analysis. We do a high case, and we do a low case. And what we recommend to PJM is our -- the middle case. I didn't mention it earlier, but part of our process is so we discreetly forecast our seven largest or fastest growing customers, and then we call them and say, Can you please give us your 20-year forecast? I don't want a capacity forecast. I want what's going to occur on the meter because that's what we're building infrastructure to, meter demand, not capacity.

And so we collect those from our customers, add them up and compare them to our forecast method. We tend to be more conservative, but -- and we talk to our customers about it. I give that customer a chance to convince us why the forecast -- their forecast is more right than ours. And so it's a very iterative process that makes it -- you're trying to make it as valid as possible.

COMMISSIONER TOWELL: And to clarify one word that you used, Mr. Blackwell. You said you tend to be more conservative. From the company standpoint, which direction is conservative?

MR. BLACKWELL: Lower than the sum of the

customers.

COMMISSIONER TOWELL: Thank you.

MR. BLACKWELL: And here's a way to think about it. I think your question I didn't address was you talked about if you're under the forecast or over the -- results are higher. If you tend to under forecast, it's self-fulfilling because if you're under forecasting meter demand, you can't serve it. You have to put infrastructure in place. So it's kind of self-correcting. If you over forecast you perhaps may build more than what the industry will consume. But we have not experienced that, so.

COMMISSIONER BAGOT: Mr. Hewa?

MR. HEWA: Yes. Thank you. So at the local delivery level, we are not discounting the request. If a member asks us for 300 megawatts, 300 MVA, we're designing for that. If they ask for 900, we're designing for three 300s. They may occur in phases, but we are not discounting the potential for the site.

And I think there is a very substantial, very large question mark around hyper scale campuses because one of the benefits of those initiatives is that it's met all of its local planning and zoning, the transmission owner has responded with the necessary or at least some portion of the necessary infrastructure. And for

Virginia, that could represent a massive future opportunity of readiness for these sites to build out quicker than can be done in other markets, potentially.

And so the amount of power that we have and the pricing matters, and the scale of these campuses matters, not just for the initial load ramp in the first several years but also an economic engine that could be extremely valuable for Virginia.

In our organization, we've created an entire division. Right? We've hired a growth officer. We have multiple economic development team members solely focused on data centers. An engineering team and an engineering procurement and construction contractor solely focused. It's become such a large challenge that we've actually kind of had to develop a parallel solution to the rest of our 18,000 miles of infrastructure to design it and work with it.

And we want our data center members to -- we want to collaborate extremely highly with them. We want to make sure they understand how committed and capable we are of understanding the gravity of their project and their need to get in service and to meet their in-service date. So our model, which is already very, very, very collaborative, fits nicely.

You mentioned the question around realness. We

do work with both what I would say enterprise data centers as well as co-location. And the co-location may be slightly more speculative. But nonetheless, of the 16,000 megawatt portfolio that has -- that we are engaged with nearly, one-fourth, nearly 25 percent, almost, of the transformers are already paid for and on order. So these are, you know, 4- or $5 million transformers.

So there is a -- in our organization, there is a high degree of realness. It's difficult to predict on the generation and megawatt consumption size later on. But from an infrastructure perspective, we are feeling and experiencing what I would say is a very, very tangible. That being said, in the example I used today, I said if only half of our portfolio builds, I simply said that just to express that, you know, signing a letter of application and committing to the third phase of a project are two different things.

But we are seeing also fluctuations. And I would just add that when we have seen fluctuations, for the most part, it's been an addition of load predominantly.

COMMISSIONER TOWELL: Thank you.

COMMISSIONER BAGOT: Yes, Mr. Blackwell?

MR. BLACKWELL: Yeah, that he brought up a good point I didn't talk about. So let me clarify it a little

bit. So if a customer comes to us and says, Build 300 megawatts worth of capacity at this site, which happens all the time, we -- the customer nor Dominion Energy believes that customer's instantly going to go to 300. All big infrastructure, substations, transmission generation, you're building in advance of the load.

But the process for PJM and IRP, there's a check and balance. So hypothetical example. Every customer says, build 300 megawatts, I want all that capacity day one. We know that's not how the meter's going to turn. And so we will, like John, build that; if they're willing to pay, you do it with contract dollar minimums and things like that.

We'll build that, but we don't expect that metered load to instantly go to 300. The checks and balance in this is your long-term meter demand forecast because that's what justifies big transmission projects and generation projects.

COMMISSIONER BAGOT: Thank you. Okay. So I wanted to follow up that a little bit and pull in Mr. Karandikar's -- something that he mentioned in his pre-filed comments, which was this discussion about a new type of emerging (indiscernible) that SERC has identified as rapid non-traditional load growth. So pulling in our discussion that we've just had about the types of

information we use to decide whether a project is speculative or not, or the amount of load we can expect to show up and the risks -- I think you also talk about sort of this interdependency of reliability risk.

So what are the -- going forward, what are the information gaps that the utilities have or between utilities or between the utilities and PJM or other regulatory bodies that we need to bridge in order to get more comfortable with the forecasts -- or the reliability of the forecast that we're getting or to just get better forecasts?

So I'll open that up to anybody, but I'm curious if there are information efficiencies that need to be happening going forward.

MR. TINJUM: Yeah, and I think from the data center industry's perspective, one concern that stands out to our members as they engage utilities across the country within the PJM footprint specifically is that the way Dominion, for example, may build its forecast may be different than how AEP is doing so, especially in Ohio, how ComEd is doing it in Illinois, and that the differences aren't clearly spelled out as that is provided to PJM and PJM creates its overall load forecast.

And so we are keenly interested in

opportunities for standardization and at least greater understanding and transparency of those differences. And if there can't be some sort of best practices established based off of what each utility is doing that we can all work and plan around moving forward.

MR. KARANDIKAR: Yeah, I agree with that comment, actually. We collect the data from our utilities on an annual basis for the 10-year forecast. And depending on which utility actually is reading the data submission instructions, sometimes there's a small bit of variation as to how they submit. So a lot of time when we aggregate the data and present it saying this is the forecast, it has its nuances built into that because everybody submits it in a different form. Some use ELCC, I know, for solar and wind. Some people are using on their experience on -- operation experience as to how they do it.

So there are certain differences, and there -- and a clear set of instructions are something that we are working towards is to make clarity as to this is what by what we mean. And open communication and transparency is the key to achieving that consistency there.

MR. BLACKWELL: I would add to that. So we're very fortunate in Virginia that we have the largest

market in the world, and we've had the longest period of time working with the data center industry over 10 years of metered data. And so we have gone through a variety of forecasting techniques that has evolved into where we are today. And so I would agree, you see in the footprint different methodologies.

The one key that -- we were asked by PJM to kind of present best practices and forecasting last year, and one of the key points I always stress to other utilities is the difference between requested capacity and metered demand. You're going to build a lot of large infrastructure, but it will take time to grow into it. So requested capacity versus metered demand is a key point I stress with our utility partners.

Last thing I'll enter is the utility industry is working on these things. We did that at PJM. We've worked with our co-op partners here in Virginia. We work with our data center customers. And at Dominion, we're probably talking to a utility across the U.S. every other week. In this past week, we had five very large investor-owned utilities we hosted up in northern Virginia this past week, sharing best practices, for lack of a better word, benchmarking, however you want to term it, so.

COMMISSIONER BAGOT: Great. Thank you.

MR. HEWA: I would just add that the pace -- when we think about the gaps, the information gaps, some of it is a result of pace and how quickly the traditional sector and, you know, planning processes operate with respect to the introduction of a fast-moving large load. Right? In my comments, I characterized Rappahannock's, you know, 85 years of co-op history. And we've got a mountain of load in progress that -- and campuses, individual campuses that will exceed the co-op's annual energy footprint when built out to fruition.

So some concepts around how we handle specific large load requests, I think, needs to be considered and how those are -- because after all, in some cases, these campuses represent more than an entire municipality or co-op. And that is being added and pressed into the system in a time frame that isn't consistent with traditional transmission construction timelines or investment or especially generation timelines for investment.

And as a retail cooperative, part of what we are keenly looking out for is to make sure and to advocate that the supply in Virginia, and not just leaning on other states, but the supply in Virginia really needs to match the demand of what's coming so that

we can keep market prices affordable so that Virginia can fulfill its commitment to all the economic development that it's already recruited and continue to be recruiting more in the future while we keep residential and commercial accounts healthy economically.

COMMISSIONER BAGOT: Thank you.

COMMISSIONER TOWELL: Thank you, Judge. Another question for Mr. Karandikar. And that is, recognizing that SERC does not have an overlapping footprint necessarily with PJM, and also that -- I believe that neither Ohio nor Indiana are necessarily in the SERC footprint, but when it comes to reliability, what trends have you seen in other states within SERC? And how does kind of Virginia kind of stack up within that overall grouping of states?

MR. KARANDIKAR: Thank you, Judge, for that question. I want to first of all clarify that our mission is to assure the effective and efficient reduction of reliability risk and emphasize that SERC is an independent and objective voice that educate and focus only on reliability. So we usually have divided our system -- we are over 16 states. We serve over 100 million people or over 300 entities.

We divided our system into seven -- we look at into seven different assessment areas, and those

assessment areas currently the way they are, they overlap based on either a planning coordinator or a group of planning coordinators. So they don't respect the state boundaries as such, as the question was. So we have in the future plan to do and start looking at the state boundaries. But, you know, the grid does not respect the state boundaries. So we kind of look at how the system is operated rather than how it is -- how it needs to be regulated from a state perspective.

So that's our focus. So I can talk a little bit more about other regions, how they are preparing or how they differ from each other. SERC has one of the longest coastal lines of any other regional entities. We are very much focused on the impact of weather. If you look at our risk report, weather shows up as number two risk on that list. It's not just limited to hot or cold. We see a lot of hurricanes. You saw the Hurricane Milton and Helene cost a tremendous amount of damage to life and property this past hurricane season.

So our focus is on building that. Hardening the system is part of that, how we are trying to approach it. So the coastal regions are more focused in that. Florida, for example, MISO south, which includes -- Entergy is a big utility in that area. Southern with the coast of Alabama and Mississippi also

in the same region.

We also experienced some ungodly weather. I know the Winter Storm Elliot was mentioned. It was the first time in the history that SERC region dropped some form load about totaling up to -- close to 5,000 megawatts that got dropped during the Elliott. So winter weatherization of generators is something that we heavily focus on. This is more applicable to the south side of SERC, not so much of the north side because the way the generators are built are different in the north because they expect it to get cold, unlike the south, where they expect not to get cold.

So they are more focused on how they are going to winter weatherize that -- those generators also. So that one another focus of how we are addressing or at least talking about or having discussion around the risk.

As far as the large load growth is concerned, we see that across the SERC footprint. Northern Virginia, obviously, is the Virginia -- Dominion of Virginia is one of the largest growing. We usually have -- in the past years have the compound annual rate -- growth rate of about one percent to two percent. Virginia itself, now it comes to in the data that we see is about 8 to 10 percent.

Georgia is another state that is also seeing a

rapid increase in the demand growth. And Florida is other. There are always -- there are a lot of people moving to Florida. I'll mention this here as well. South and Southeast is the only region in the country which is seeing a population growth. So about 1.8 to 2 percent of population growth is seen in this region. All the other areas of the country actually has a negative population growth. So we have to account and we also look at how the general uses of electricity is also going up. Thank you.

COMMISSIONER HUDSON: Did you have another question?

I think that's a nice segue into resource adequacy, and I wanted to hear from the panelists to talk a little bit more about that and kind of ask, do we need to improve load growth modeling to better reflect the impact of data centers as it relates to resource adequacy?

MR. KARANDIKAR: I'll kick it off, per se. So, you know, the large load -- it is a resource adequacy problem. You know, it's a math problem. There are two problems here we are talking about. I'll talk about the math problem first, which is essentially what the generator we need in order to serve the actual load.

But what we have seen in the past is

that -- and somebody on the panel already mentioned that the load that we see from the data centers is a 24/7 kind of load. So you see that 365 days a week -- a year that it's going to be there.

The generation queue, if you look at that, it's mostly made of a solar generation with a little bit of hybrid in there. Somewhere in very little natural gas is -- as well. If you look at other part of, these are the things that the resource are coming onto the system, you also need to look at what are the systems that are getting off the system. So we see a lot of coal and natural gas are also planning to retire. About 8,000 megawatts of coal is what we are projecting to retire in the next 5 to 10 years in this -- at least in SERC footprint. And the number is much larger if you took -- take into account other places as well.

So we need to focus on how do we -- can we slow down maybe the retirement. And I'll qualify that, that I'm resource agnostic. I'm worried only about the reliability of the system and not quite concerned with which resource it comes from. If there is a mix of solar, it has to come and combine itself with some other resource that can provide the 24/7 kind of scenario as well.

The math problem -- that was the math problem.

The physics of it is that the large load have operational challenges associated with it. I think you mentioned that as well. And operating-wise, what we have seen is that -- and Mr. Blackwell mentioned that the size of the data centers is growing. Some of them are now bigger than the generator -- of some of the single generators itself, you know, those big nuclear power plants. And they cope, but they're bigger than those.

Planners are very good in studying the loss of generators. You know, when you lose a generator, what do you do? Manage the system. Not so much as to what's the loss of load causes it. We experienced that very recently, but that size of load continues to grow, and that is something that we need to study because it gets into a stability and transient problems. The load that we see from the data center is much more aligned with what we see from the inverter-based resource. We have studies that we have experienced that those inverter-based resource came offline and -- because they could not ride through.

So some more studies need to be performed in order to make sure that the load also stays online during this fall when the relays and the breakers are doing their job to isolating the faulty areas. Thank you.

COMMISSIONER HUDSON: Sure. And do you think

that the bring-your-own-generation model is a viable model to address some -- or offset some of the resource adequacy challenges?

MR. KARANDIKAR: So talking about generator studies part -- from study point of view, there are a lot of black box models that are involved here. And I'm assuming that is kind of a roadblock for anyone and everyone to take those and perform the studies as such. So we need to expand that area as to make these not just the generator model but also the load models. We're not very good with the dynamic load models yet. We're getting into that modeling and study side of it. We're not quite -- we're getting better at it, but we would like to see some more improvements in that space on how the load models are created so that it gives us a little bit more insight into planning and predicting what the system would behave into the future.

COMMISSIONER HUDSON: Thank you.

COMMISSIONER TOWELL: A question I think related to data centers broadly. We've been using the term data center kind of generically so far, but I would be particularly interested in hearing From the Data Center Coalition but also anyone else who has particular insight in this and that is, you know, not all Hyperscale Energy users are necessarily the same, whether it's the

demand that they're pulling off the grid, the underlying service that they're conducting, their ability to potentially reduce demand in certain circumstances.

And so I'd be interested in hearing kind of within the umbrella of Data Center, what sort of breakdown we're really talking about, especially when it comes to firm 24/7 demand.

MR. TINJUM: Yeah, happy to answer the question. And it's an important one. And I'll start by stating you know, DCC's membership, we have two different business models that are reflected. One that is often referred to as hyper scaler. Increasingly, we are referring to them as self-performers or enterprise data centers, those that are building facilities to support their own operations.

And then the other model are multi-tenant co-location facilities, which refers to those facilities that are leasing to one or more tenants. So they may build the facility and then lease it to one very large customer. There are also multi-tenant facilities that lease to upwards of 200 customers within a facility.

And so those two different business operations or business models occur within our membership. I should note that none of DCC's membership conducts cryptocurrency mining or staking as a primary business

operation. We see that as a very different business model, a different mission. And then in relation to energy, it manifests different grid characteristics. I think in certain jurisdictions, you have seen crypto miners or stakers participating more regularly in demand response programs as part of their business model.

From our perspective, as has been discussed on the panel here today, our members are generally 24/7/365, supporting the essential services offered by cloud computing and then also artificial intelligence. There's a lot of coverage, obviously, and importantly around the growth in artificial intelligence and what we'll see in the coming years.

I have seen multiple studies that indicate that the vast majority of data center development to date is still going to cloud computing, especially when we consider the shifts coming out of the pandemic in terms of virtual meetings, cloud storage, online banking, financial transactions, online education. So much of that is still a reflection of cloud computing.

COMMISSIONER TOWELL: Two follow-on questions, and good job reading my mind on some of these. You described two different kind of business models. Is that somewhat akin to say owner-occupied versus rental properties?

MR. TINJUM: Yeah, I think that it can be boiled down that way. And then I think that's an important consideration when considering multi-tenant companies, those that are leasing server space within their facilities. Just as you wouldn't have control if you were, you know, renting out an apartment to what's occurring in every individual apartment unit in terms of their energy consumption, the companies that own these facilities don't have control over the server infrastructure. And so when we talk about potential for load flexibility or demand response, that's significantly limited because they don't control their customers' servers.

And then also there are contractual obligations for 99.999 percent uptime, we call it the five 9s, that require them to ensure that those servers are up and running and have readily available power.

COMMISSIONER TOWELL: And one additional question. And then I think a follow on, then, for Mr. Blackwell. And that is, I may have misunderstood, but -- so please correct me if I'm wrong.

But you said that when it comes to crypto mining, that the underlying infrastructure is sufficiently different than existing data centers that are in the Virginia footprint would not be compatible

with that particular use?

MR. TINJUM: I don't have information to that, so I don't want to overextend my response. I will say that it's our understanding that certain computing servers are better suited for crypto applications versus cloud computing or artificial intelligence.

COMMISSIONER TOWELL: And then, so, Mr. Blackwell any insight you have on that would certainly be particularly useful, as well as how the utility in your case, if at all, differentiates between the kind of view it takes with respect to owner-occupied development versus what I have ham-handedly called the rental property model?

MR. BLACKWELL: Yeah, so we -- from our perspective, all customers are good, but they behave differently. And so hence the -- you know, go back to statistical -- to statistically modeling behavior. And so we have -- I'll add one more segment to what Aaron, Mr. Tinjum, provided.

Hyperscale or cloud computing, the way I think about it is they put their own servers in their facility, and you're buying space or capacity on their server. Think of the big ones.

The co-location segment Aaron talked about, the behavior of a co-location company has nothing to do with

the name of the company. It has to do with what customers go in there. So you could add Tinjum Data Centers has two buildings. One, he has a cloud provider in there; it's going to behave like a cloud provider. The other one's multi-tenant; it's low profile will look completely different.

And so we don't forecast, if you will, by the name of the company, just simple way. We don't do it that way. In fact, for our co-location segment, as I mentioned, we forecast them in total.

Now, the one -- the crypto currencies today in Virginia, we're almost 50 percent cloud or hyperscale and about 50 percent co-lo. It's -- just say 49 percent each of those. And then there's another category called enterprise. Think of banks. There are banks that will build their own data center facility for their customers' data. You don't see a lot of that, but there's an enterprise segment.

We have one cryptocurrency firm. We had one years ago. It was here about two years and went bankrupt. We have one now. It's very, very small. Virginia is not and has not really been a cryptocurrency market. But we do like to look at these types because their behavior is different.

So cloud co-location enterprise, it's all about

how quickly they ramp, but their 24/7 usage patterns are all the same. They all behave the same. It's just how fast do they grow into capacity? Each have a little bit different structure. Cryptocurrencies, if they tell you set the meter, in two months, I'll be at 20 megawatts, they will do that. So we have had that experience.

So you watch them because if you build it, they'll fill it very, very quickly. So -- but again, we have one very, very small cryptocurrency in our service territory.

MR. HEWA: So if I could add, I think the nature of this discussion really portrays how we need to look at data centers as a group in aggregate, but they need individual treatment all the way up to PJM. From a distribution perspective, we have an obligation to serve, regardless of what that end use might be. But given the scale, the need to handle them as a group but also to have each individual project over a certain size individually handled all the way through its fruition, both from a planning perspective, which has to happen quicker and maybe rotate more quickly than it has in the past, and from a contractual perspective.

And then as that occurs, I would hope that in the commonwealth, we could run scenarios around supplying and demand and look at how that relates to reliability

and pricing with the intent of assuring reliability, affordability, and keeping Virginia on top for competitiveness.

COMMISSIONER BAGOT: Thank you. So I had a question about -- well, I have a number of questions. Trying to decide which one to select from. I'll talk about -- if we're talking about planning, I'll talk about transmission planning with respect to some of these data center loads and the requirements that come from them.

So at the utility level, there's the local planning piece of it. I think in PJM that they use the word supplemental planning. And then there's also the larger regional transmission planning process. So I want to explore a little bit how these data center load forecasts are accounted for in both of those planning processes and what degree of coordination is there in terms of efficiencies between addressing needs through local projects versus addressing needs at a more regional level, particularly with respect to, like, cost efficiencies that may be available to customers.

COMMISSIONER HUDSON: And Judge Bagot, if I may add.

COMMISSIONER BAGOT: Sure.

COMMISSIONER HUDSON: I would also like to find out, do you think that the current transmission process

is agile enough to respond to the rapid pace of the data center growth that we're actually having? If that's helpful.

COMMISSIONER BAGOT: So I didn't direct that at anybody in particular. I will note there's one utility representative and a co-op representative up here, but I'll open it up to anybody who has some thoughts on those questions.

MR. BLACKWELL: I'll go ahead and start with that since Dominion Energy is a transmission owner in this area. So when you come and say, I'm going to build a data center campus, you -- I want 300 megawatts of capacity, that's a substation on our system. That's our standard. The first thing we do is look at where is existing transmission, how far away is that? Most data centers try to get as close as possible.

And so step 1 is you do transmission planning to run a quarter-mile line from existing transmission to the facility. That's typically easier transmission planning. The second step is, I now have this connected in my study, but is there a bottleneck somewhere up line from here? And so it gets much more involved than when you're doing transmission planning. Where is the closest bottleneck? While electrons can flow, will I run out?

My simple analogy, if you have a bunch of kids

and everybody gets in the shower at the same time in the morning, you have no water pressure. And so you have to kind of think about that, is the water main big enough coming into your house? And so that becomes -- and the gentleman to my far right may be able to talk more about that. But you have to look more regionally. It may be in Dominion's territory. It may be in another state. Where is the bottleneck? And that's -- globally, you have to look at both of those.

So what we would do as a utility is say, I can connect you, but I can only serve you 100 megawatts because I have this project 100 miles away that happens to be the bottleneck in my example, and until I energize that, you can't have any more. And so that's -- at a very simple way, that's how transmission planning works.

MR. KARANDIKAR: Thank you, Mr. Blackwell. I'll comment a little bit about -- obviously we don't do the TPL analysis as part -- as, like, transmission planning as such at SERC because that's the responsibility of individual entities. But what we do is we do seasonal and long-term assessments of both resource adequacy and for transmission adequacy.

For transmission adequacy in particular, we build models with the help of our utilities, but for the entire eastern connection, and use those models,

especially for the SERC region, to perform transfer analysis, contingency analysis. We do cascade analysis, so we do a very comprehensive study in a transmission space for the entire SERC footprint.

Now, I'll caveat that because we are limited by the data that the entities provide us. So we are not -- we are only limited -- I think the modeling requirements is that if it's a tier one kind of resource, then you are projecting it to go in, you're quite certain, you put that in the model. And that becomes a part of the study.

But the future, the scenarios part, we don't get into it because we are only limited to what the entities provide us in order to what we study. We do have multiple different scenarios with that we run. We have a summer, a winter, a short -- you know, a shorter case. We have a 5-year, a 10-year-out cases.

So we do a whole bunch of scenario studies that we perform. And we do that every year. And we compare how the system is changing year over year as well.

The next step in the process is taking the SERC model and bringing it on an eastern interconnection level. So we partner with our sister regions, ReliabilityFirst, NPCC, and MRO in order to look at a much larger system as well. We don't quite perform the

study as such. We used to do that like five years earlier. We used to actually do a study on a entire eastern connection. We'll do a transfer analysis and see what the size of the pipes and bubbles are. We have not done that in past five years.

But fortunately, we just completed a study that the Congress asked NERC and the regions to do. That was the inter-regional transfer capability studies. We learned a lot from that, and we plan to continue to do that. That is an interconnection-wide study to identify some of those bottlenecks, per se, and provide that feedback back to the entity so that they can do things to mitigate them.

MR. HEWA: So as the link in the chain, if you will, between the transmission owner and the data center, one of our biggest risks or concerns is in the case where regional or transmission investment is being made on account of certain projects but is a regional approach and paid back over time through PJM's billing determinants, which are based on peak demands. There are a few serious concerns for us as the local distribution and delivery provider.

One is the scenario of project cancellation. In other words, the transmission owner mobilized to build, and the project cancels, and we're working to

secure that obligation from the customer. But the other one is really with respect to recognizing that for the most part, the transmission owner may not be billing the data center up front for the regional transmission infrastructure. That is a calculated return on investment for that owner over the next, you know, 30 years, for instance, through the PJM billing determinants. And one thing we need to be cognitive of is that those billing mechanisms within PJM focus on what's called the 1 CP, and some zones it's broken out as 12 CPs.

But in either case, it's either 1 peak hour or 12 hours. And the divvying up of those transmission investment dollars are made by customers based on their contribution, their load or their demand at those hours. And so one scenario we need to be thoughtful about, one is cancellation, where somehow the project isn't secured enough and the data center isn't paying for cancellation. And the other one is where the transmission got invested, but during those peak hours, the customer is able to come off their load, switch it to, you know, Nevada or Texas or wherever they may own multiple facilities, and actually not be held accountable for those billing determinants for that year, that -- the following year.

So there are some mechanisms that back up

large, large, large scale investment that we need to be very thoughtful about in the ultimate decisions around equity and paying for the cost of causing that investment.

COMMISSIONER BAGOT: Can I ask a clarifying question?

MR. HEWA: Yes.

COMMISSIONER BAGOT: When you're talking about cancellation and the risk around cancellation, are you talking about the data center -- the need from the data center disappearing and so there's no longer a need for that regional transmission investment and so there -- you may have built something and there are stranded dollars associated with it? Or are you talking about cancellation of transmission service associated with --

MR. HEWA: Yes, I'm really speaking of the first scenario and really kind of two variations of that. One, it would be an outright cancellation. It's a four-year project or three or four or five years to end service, and the owner goes away or their project dissolves after the transmission commitments have been made, and the transmission owner is beginning or far -- you know, well down the road of extending those facilities. So in that case, the project goes away.

In the other scenario, a projection around 800,

900, 1,000 megawatts of load, and the realization is 100 megawatts or 50 or -- you know, for it. And I think that would be an unusual case. But those are the scenarios at the distribution level that are very critical to us because we are in fact in the middle of that transaction. And to try to secure it long enough with each different customer in understanding their contribution to -- in the investment is a challenge.

But even after it goes in service at full operation, if you're not -- if a data center drops its load so profoundly during the peaks, it is not computed in those billing determinants from PJM. And, you know, others on the panel can correct me, but you could be a thousand-megawatt load. But during those peak hours, if you're 400 megawatts, then that is the allocation of that transmission investment for the next year, and so on, year to year to year. And right now that's a 1- or a 12-peak scenario, depending on how you're looking at that.

COMMISSIONER TOWELL: Just a quick follow up on that, Mr. Hewa. From what I understand from the demand profile, the risk you identified first in response to Judge Bagot's question, that the project gets largely built and then the particular project owner bails, is there not at least currently some cushion given the

enormous demand for projects that you're not going to have to sit on a stranded transformer; there's going to be someone who's going to want to move into that spot pretty quickly?

I understand if someone doesn't pay, you can't just swap them out for another customer. I understand that.

MR. HEWA: Right.

COMMISSIONER TOWELL: But when it comes to project build and especially related transmission, won't somebody come and connect to your facility?

MR. HEWA: I think that is very likely. From the local assets, those are prepaid. So our cooperative is receiving prepayment. So we are financially covered and covering our members on that. It's really more the transmission investment.

And as this -- as our service region, I'm speaking more for Rappahannock at this point, as our region has evolved, I think it's become quite clear that if a project were to cancel, there's a very high likelihood Of a successor project behind it. And I think that gives us some large degree of comfort.

Now, will it be the same size and the same timeline? Those questions remain. But we are nonetheless -- for a rural site that might be a long

transmission build away from or a rebuild or an increase or enhancement to transmission line for a site that's kind of out of some of the major load zone areas, that does remain to be a risk that we're very much focused on to make sure that we don't have anything that falls back on our member owners.

COMMISSIONER TOWELL: Thank you.

COMMISSIONER BAGOT: All right. We're getting close to the end of this panel, unless my other colleagues have questions. We got about two minutes left, so if anybody has any final closing thoughts that you want to wrap up in about 30 seconds or less, I'll open the floor. Otherwise, we can break for lunch, I guess.

MR. KARANDIKAR: Thank you so much once again. Deep appreciation for hosting us here. I did not hear anybody talk about cybersecurity. But I just wanted to put it on that with all the data centers coming in, the threat landscape has increased tremendously. And as we've -- I've talked about that if the load can be altered up on or off, that could severely impact the grid stability. So that needs to be considered as well. Thank you.

COMMISSIONER BAGOT: Thank you.

MR. CHUPKA: Yeah, I'll just comment that the

last exchange, last few minutes where the lumpiness and the speed and the type of load that data centers represent has -- brings out questions of not only sort of local transmission and distribution planning and investment but regional. And I think that's very emblematic of why data centers need to be considered as a separate type of load so that the system can accommodate these rapid and significant changes.

MR. TINJUM: I'd just conclude again by reiterating this moment, period, era of load growth is an important one that does require greater communication, collaboration, transparency among all parties involved. And so DCC, our member companies are here. We're leaning in as an engaged partner and want to be helpful at this moment.

So please consider us a resource to the Commission, and we will continue to engage in forums as needed. So thank you.

COMMISSIONER BAGOT: Thank you.

MR. BLACKWELL: Yeah, very briefly. Thank you for having -- allowing Dominion Energy to represent this issue. And second, about the lumpiness, we are not seeing that today in our service territory with data center load, nor have we seen it historically.

So it's very steady load, just based on 10

years of metered data.

MR. HEWA: Thank you again, and I greatly appreciate the considerations around utilizing market rates and the financial safeguards that I've discussed handling these individual loads from a specific planning perspective and even co-op affiliate models.

Thank you again to the Commission. And I would just urge us to be thinking about the capacity needed in the near term -- immediate term and the near term to keep Virginia reliable, affordable, and economically competitive. Thank you.

COMMISSIONER BAGOT: Thank you. And thank you all to our Panel 1 participants. I really appreciate all the time you spent with us today and answering all of our questions. So thank you so much for being here.

And we will now break until 12:30 for lunch. Thank you very much.

(A recess was taken.)

JUDGE BAGOT: Alrighty, hopefully everyone had a good lunch. It might have went very quickly, but it's a welcome caffeine break. While I get set up up here, I'm going to ask for the panelists from Panel 2 to join us.

(Pause in proceedings.)

JUDGE BAGOT: All right. Welcome back. So

similar to the first panel, I'm going to have everyone do some brief introductions and introductory remarks if you have them, starting from my left and going across that way, and then we'll jump into questions.

So starting with you, Mr. Gaskill.

MR. GASKILL: Good afternoon, Your Honor. Scott Gaskill, I'm vice president over regulatory affairs for Dominion Energy. I appreciate the opportunity to be here in such an important and often complex topic. So happy to provide our thoughts as well from the utility perspective.

So, Judge Bagot, I think you sort of teed it up very well this morning when we talked about sort of three different buckets of categories: One is the cost allocation issue in terms of our various customers or customer classes paying their equitable share of the utility system.

The second is the risk associated with those investments. Obviously, we have long-lived investments, 30- to 50-year assets that we're building for new customers as well as all of our customers. And then the third one you mentioned, which I think is very important, is the impact to wholesale prices that the large load is driving, among other things. So I'd like to address each of those very briefly.

And so on the cost allocation issues, as I mentioned in my prefiled comments, we do believe that, at least to date, that our current allocation methods do appropriately allocate costs among the various customer classes. And I gave the illustration of our transmission costs over the last five years in that the cost allocated to the residential classes decreased. Those factors back in 2020 were just under 59 percent of our Viginia jurisdictional transmission costs were allocated to the residential class. They're now just under 49 percent, so a decrease of 10 percent in that factor.

Now what's driving that is two different things. One, in 2021, we changed our allocation methodology from -- and we heard a little bit about this in the first panel -- from a 1 CP allocation to 12 CP allocation. So that's an example of these costs and these allocation methodologies continually getting reviewed every year. And just because we've done something in the past doesn't mean we're married to that. We can continue to review it and change going forward as needed.

But then just naturally, the growth in the GS-3 and GS-4 load classes or rate classes has increased over that time, which just naturally is going

to reallocate costs to that load class, and you'll see a residential decline of that class at about -- so what you see over the last four to five years from a transmission perspective, residential is actually paying slightly less than they were today than they were in 2020. Of course that comes at a cost where those increased costs are being allocated to is our GS-3 and GS-4 classes, so you've seen an increase in those costs.

I think if you expanded that and looked at base rates, residential is paying slightly less. We've had a -- we've had a slight decrease in base rates in 2023. You know -- or 2021, triannual.

And then in the 2023 biannual, rates were largely flat and rebalancing between generation and distribution. So I think you would see that same similar phenomenon play out and not just in transmission rates, but I provided that as an example.

As they say, of course, past performance is no guarantee of future results. And so were are mindful of the high infrastructure cost in the -- that the pace and the scale of the new build roads creating large infrastructure investments. And so it is something we want to continue to review, monitor. And just like I said, when we shifted from a 1 CP to a 12

CP, those different allocations and different options, we would continue to review going forward.

And let me just maybe skip you a little bit out of order of the impact to the wholesale prices. I view that as probably the single largest driver, the rate increases say of really the next three to five years.

Again, from an infrastructure build perspective, I think our current cost allocation methodology largely would take care of that and the fact that the GS-3, GS-4 classes are going to continue to be allocated more and more to those costs. But when we talked about the impact of, you know, energy prices just in supply and demand in the whole PJM region, that's going to be socialized across our system and our fuel factor.

When we talked about higher capacity prices, what we've seen as his auction in the '25, '26 auction where prices went from $29 in megawatt data to $444 in megawatt data. Those are going mourned by all customers. And so I do believe that that is where you're going to see the highest that we see in nearer term, rate impacts to all customers. And so I'll kind of leave you with that there.

So on the issue of stranded cost risk, we do

have a number of provisions now that attempt to address that, primarily on the distribution side. We have a contract dollar minimum which ensures that these customers over a four-year period will contribute revenue into the system to pay for the investment to match their distribution costs. So we've got to build a new substation for them, say it's $30 million. We will ensure that they will be paying at least $30 million into the system over a four-year period.

There's also contract minimums on the distribution side. But as I noted in my prefile comments, we do not currently have that on our generation in transmission side of the tariff. That may be something we're going to look to address in our upcoming biannual review.

So I will pause there, but again, most of these -- it's a conversation. We are listening as much as anybody in gearing up towards the biannual review which we will file in March where we would expect to make various proposals or recommendations to address any deficiencies that we currently perceive, so thank you.

JUDGE BAGOT: Thank you.

Mr. George?

MR. GEORGE: All right. Good afternoon,

Chair Hudson, Judge Towell, Judge Bagot. Thank you for holding this Commissioner-led technical conference and providing the opportunity for Google to present before the Commission.

My name is Brian George and I'm the U.S. Federal lead for Google's Global Energy Market Development team. My job responsibilities include establishing Google's energy policy and strategy across the U.S. federal government, the organized electricity markets, including PJM, and working closely with Google's state energy policy and economic development teams to establish coordinated policy and strategic priorities across the states with the focus here on Virginia and mid-Atlantic.

In my role at Google, I work across the ecosystems advocating for Google's energy policy priorities in the Commonwealth. Since 2018, we have invested more than $4.2 billion here in Virginia. While there is no question that lower growth has entered a new phase both in Virgina and nationwide, Virginia continues to be a bellwether for what other states and other regions can expect. As such, Virginia has a unique opportunity to lead in developing sensible policies that fight the climate crisis and able continued economic development, and most importantly,

protect consumers.

This is a critical and dynamic moment in the industry as demand for electricity increases driven by new large loads such as data centers, reshoring with manufacturing, and the electrification of other economic sectors, the Commission has a critical role to play in ensuring that all Virginians continue to receive safe, reliable, and affordable electric service.

As I articulated in my written testimony, I'd like to offer Google's perspectives on a lot of issues, but including clean energy leadership, opportunities for cost reduction, considerations for cost allocation, and the importance of offsetting investment risk associated with demand, forecast, and certainty.

And so in that vein, I really appreciate that the buckets that were teed up: the cost, the risk, and the impact to wholesale prices. We think there is a lot of opportunity to work with our utility partners and other partners across the ecosystem to develop frameworks that work well for them, but also enable us to grow in a way that protects customers.

As Scott mentioned, we've been doing a lot of thinking in particular around contract demand minimums, increased collateral requirements for new

interconnecting customers, all in a way to ensure that our industry is accepting more risk when we're coming to the grid in a way that balances the investments our utility partners have to make.

So with that, I'll be short. You all get to hear from me on two panels today, so I won't keep this one long.

Google does stand ready to partner with our utilities, other customers, and regulators, to develop workable solutions that continue economic growth and cost effective deployment of clean energy. I do applaud the Commission for your proactive handling of today's conference. Thank you.

JUDGE BAGOT: Thank you.

Mr. Wilson.

MR. WILSON: Good afternoon and thank you so much for the invitation to come here and speak. Yes, I'm James Wilson. I'm a consultant and an economist doing business as Wilson Energy Economics. And my work in the PJM space has mainly been for consumer advocates and environmental groups and in Dominion for environmental groups. But the views I'll express today are my own and not necessarily those of any client.

I'd like to talk a little bit about load forecasting, such a critical topic. And I've been very

interested in data centers since 2016 when it started to become a huge addition to Dominion's load forecast, hundreds of megawatts at the time, and of course, now, it's thousands. It's hugely uncertain. We've said that and my neighbor, Marc Chupka said that in the first panel.

AI is the new demand that is going to be creating this demand. So all out historical data about data centers doesn't tell us anything about AI, so projecting based on historical data isn't going to work.

AI, it's the end-uses for AI. I'm going to say their names: Amazon, Google, Microsoft, and Meta. Those are the names that come up over and over and over when we talk about data centers and AI. They are racing and competing to put AI into everything. They believe that's the future. They're competing with one another, and they do not want to lose that race because they didn't have the hardware. So they're building everywhere and anywhere -- I heard it put recently -- data centers as they can. So it's hugely uncertain.

The final demand for AI-type services. It's hugely uncertain the chips that will produce that. And we're not talking 10 or 20 percent, but you see -- you see orders of magnitude suggested as the possibility

for chips getting more efficient.

It's hugely uncertain the software that will run on those chips to produce those applications. It's hugely uncertain the power needs for those chips. And, of course, it's hugely uncertain where the next generation of data centers will be built.

The first generation was built in Virginia. You are exceptional in that regard. There's no question about it. The next generation, not so clear. You see huge data centers going in Wisconsin and Louisiana and lots of other places, so just huge uncertainty.

So what does that mean? To me that means you really need to get an outside forecaster involved to help with this. Somebody who can do that kind of blue sky of what are some of the different ways the world could go over the next 5, 10, 15, years. They would produce multiple scenarios. Each scenario would have a narrative that might be very, very different, and I believe those scenarios would be very, very different.

Sitting here right now, I think our forecast of data center load for say, 2032, is probably off by a factor of two. I just don't know which way, two times too high or two times too low. But a professional forecaster would give you those scenarios that then

could run through and say, you know, what happens if we built billions and billions of dollars' worth of transmission?

And then we're on this scenario where the next generation of data centers is largely being built in places other than Virginia. Which I consider that definitely one of the -- one of the very likely scenarios simply because Virginia is so overbuilt. You're less than 3 percent of the U.S. in terms of GDP or population, but you got 38 percent of the data center capacity from first generation. It seems to me that out to even be a national security issue that you're so concentrated here.

So anyway, that all comes to cost allocation, potential cost shifting. PJM area is a great place to build something very large like data centers because the transmission gets largely socialized over the entire area. You build out somewhere remote -- I mentioned Wisconsin and Louisianna -- you're likely going to have to build the generation to power your data center. You're not going to be able to just kind of let the grid supply you.

So cost shifting and of course stranded cost, you mentioned those risks are very substantial. So it seems to me that the approach is in the first instance

to call on the data centers to self-provide the reliability they need to the extent they do. Right now, they've all got diesel generation that they would only use for themselves.

But if they had clean dispatchable backup generation, then they could become a partner on the grid. And the electric power researched institute referred to how we have historically connected customers as the passive load model which is the costumer comes to the utility, obligation to serve, they have to build.

And that was fine for the organic load growth that we've had for many, many decades of many, many small residential commercial customers, load growth following demographic and economic growth. But now we have very large point loads coming on.

And one of the nice thing about the data center industry is, like I said, they're trying to place them anywhere they can and there's a lot of flexibility to put more capacity here and more there. They're talking to -- they're looking in Virginia. They're looking in Atlanta, and Chicago, and then other locations. A lot of flexibility, and that means that passive load model isn't a necessity anymore.

So, so many more things we can talk about.

If data centers -- if very large customers aren't willing to do that to back the spatial generation and they really do demand firm capacity from the grid, then I think next is long-term, firm, take-or-pay type of contracts. Not the kind with minimum bills that we've heard talked about that are really focused on recovering the connection cost, but ones that would be recovering more of that huge investment in generation of transmission that would be necessary to serve them.

So with that, I'm sure there's a lot more to say and there will be lots of good questions. You've asked really good questions this morning. I'm sure you'll continue. Thank you for the opportunity.

JUDGE BAGOT: Thank you.

Mr. Robb?

MR. ROBB: Good afternoon. May it please the Commissioners, I'm Jack Robb. I serve as the general counsel and senior vice president of the Old Dominion Electric Cooperative. Thank you for holding this technical conference. Your willingness to lead this conference and bring together the experts appearing before you today is evidence of how important this topic is. And evidence that the Commission's being a leader on the topic of serving large-use customers.

When FERC conducted their technical

conference last month on large loads co-located at generating facilities, FERC Chairman Phillips recognized the need for stakeholders to approach these issues with collaboration. I hope to convey that spirit of optimism and collaboration in my opening remarks and in responding to your questions today.

I'm also mindful that our discussion today is taking place in the backdrop of a national conversation about resource adequacy. When FERC Commissioner Christie pointed the national focus to Virginia's Commissioner-led conference that we are having today, he recognized the need to facilitate service to large-use customers in a way that ensures resource adequacy and fairly allocated costs to all consumers.

I'll provide a brief overview of ODEC and then I'll plan to focus on two topics that are important to understand in the framework in which ODEC and its members are serving and plan to serve in the future, these new and expanding large-use customers.

Fundamentally, ODEC's remarks today are about consumer protection. ODEC stands ready, willing, and able to serve large-use customers with adequate financial protections. One of those protections is the ability of ODEC and its members to serve large-use customers using market-based rates.

The second protection is that large-use customers must provide financial liquidity from their own grid infrastructure development, operations, and wholesale power purchases. I also convey that ODEC has assembled a great team of industry experts, including several former SCC staff members, power supply experts, and accounting liquidity experts. Our team plans to submit thorough and complete post-conference written comments. They and I want to be a resource for you and our staff as we move forward together on this important topic.

With that introduction, I offer a brief overview of ODEC. ODEC was incorporated in 1948 as a not-for-profit power -- or wholesale power supply cooperative. We have 11 member distribution cooperatives that serve customers in 70 counties in Virgina, Maryland, and Delaware. Through our member distribution cooperatives, we serve approximately 630,000 retail electric meters, representing a total population of approximately 1.5 million people; a million of whom are Virginians.

ODEC serves its members power requirements pursuant to long-term all requirements wholesale power contracts. The contracts obligate ODEC to settle and deliver to our owners, and our members to purchase from

ODEC all the power they require for the operation of their system with some limited exceptions.

ODEC supplies our member's power requirements through a diverse portfolio of resources, including our generating facilities, power purchase contracts, and spot purchases from PJM's energy market.

ODEC's generation assets, which we have developed over the last 40 years are detailed in my written opening remarks. They include a combined cycle plant in Maryland, two combustion turbine power stations in Virginia, and diesel generators throughout the mid-Atlantic. We also have power purchase agreements for 350 megawatts of wind and solar assets, and are expanding our renewable energy portfolio.

PJM assigns to ODEC a capacity obligation. And our generating fleet and power purchase contract serve as a hedge against ODEC's obligation to purchase capacity from PJM. The fleet also serves as a hedge against ODEC's energy market purchases.

ODEC is highly regulated or subject to regulation by FERC. We comply with mandatory reliability standards from NERC and its regional entities including SERC. We're subject to regulation by the SEC as a voluntary non-accelerated filer. We're further subject to numerous federal, state, and local

regulations including environmental regulations, but Virginia members are subject to your jurisdiction.

In 2023, revenues from sales-to-member distribution and cooperatives totaled approximately $1.1 million and we had total assets of $2.2 million. We're rated A-plus stable outlook or equivalent by all three credit reporting agencies. As a strong electric utility, ODEC stands ready, willing, and able to serve large-use customers with appropriate financial protections.

I'd likely -- I'd like to briefly touch on two of the protections, first, market-based rates. ODEC and its members are serving large-use customers by providing energy, capacity, transmission, and ancillary services on market-based rates pursuant to the authority granted to us by FERC.

The market-based rate is a passthrough of charges from the PJM market to ODEC's members who, in turn, pass those charges to their large-use customers. It's a different framework than ODEC's formula rate which includes cost of and revenues from our generation and power purchase agreements allowing new large-use customers to receive electric service based on ODEC's formula rate, could lead to unjust and unreasonable outcomes.

Existing cooperative member consumers who have invested in for decades and generation infrastructure should not have that investment diluted or usurped by a single large customer or proof of new large customers. Thus we must rely on purchases from the PJM market to provide reliable power supply for large-use customers located in our member-service territory.

We engage with PJM regularly and have a high degree of confidence in their leadership and staff. We believe many large-use customers prefer this approach as it allows these customers to deploy their own financial or physical hedges to manage risk from exposure to market prices.

And any rule-making proceedings before the Commission or on a case-by-cases when evaluating energy service agreements and related tariffs, we ask you to determine that ODEC's member distribution cooperatives retain the right to serve data centers and other large-use customers on market-based rates.

This leads me to ODEC's second main point. Large-use customers must provide financial liquidity for their own grid infrastructure development, operations, and wholesale power purchases. Service under market-based rates means ODEC serves as the

credit sleeve to the PJM market.

When I say credit sleeve, I mean reincur the cost from PJM, pay PJM weekly, and we recover the cost from our members who, in turn, recover them large-use customers. Thus ODEC's financial condition is largely dependent on our member distribution cooperatives satisfying their obligations to ODEC under the wholesale power contracts.

A large-use customer that does not provide adequate financial mechanisms to protect against this risks could drive a distribution cooperative into an insolvency and restrict its ability to serve to remaining member consumers. Upon an inability to recover costs, any security provided by a large-use customer many not be sufficient to permit the distribution cooperative to meet its payment obligations to ODEC. As a result, ODEC could be subject to rating downgrades, increased collateral requirements, and liquidity impairments. That would raise rates for all consumers in the ODEC system.

Simply put, this creates a cost allocation risk where a cost incurred by a large-use customer who cannot pay, or timely pay, will be distributed by a distribution cooperative to its other members. And critically, if the distribution cooperative cannot meet

its payment obligation to ODEC, then the cost will be paid by member consumers throughout the ODEC system.

Various risk mitigation tools exist to address these issues. ODEC groups these tools according to three buckets of cost allocation. The first bucket, which we've talked a lot today, is the cost incurred for the study, development, and construction of new transmission and distribution facilities for large-use customers.

The second bucket is cost allocated to a retail distribution cooperative based on the wholesale billing determinant or billing unit set by including a large-use customer's load in calculating that determinant.

It's the cost that Mr. Hewa talked about earlier: charges for capacity and transmission that are set by coincident peaks in Year 1 and billed to load in Year 2. If the large-use customer is no longer there to pay the bill in year 2 even though they contributed to the year 1, then the costs are socialized to other members.

And the third bucket, which are the costs that can present in existential risk to ODEC, and its members are costs incurred for energy services provided to a large-use customer, especially during sustained

periods of high market crisis.

So how could we mitigate these cost allocation risks? The first bucket to mitigate the costs for new transmission and distribution facilities, ODEC and its members are working with transmission owners and large-use customers to arrange for the following: 1) Prepayment of estimated study development and construction costs with Truos (phonetic); 2) security for development and construction cost overruns; and 3) security for a project cancelation cost if our load ramp does not realize to the levels forecasted.

Some of these costs are not directly allocated to large-use customers, however. But instead, are allocated through the PJM system transmission allocation as Mr. Wilson just mentioned. Some of those costs at the system wide and some of our transmission zone. For the costs, ODEC is open to exploring with the Commission an allocation directly to the large-use customers at the retail level.

For the second bucket, costs allocated to a retail distribution cooperative based on a wholesale billing determinant including any large-use customer's load. ODEC and its members are working with the transmission owners and large-use customers to do the

following: 1) Identify effective determinants as far in advance as possible; and 2) require sufficient security from a large-use customer in anticipation of the determinant's impact.

Finally, for the third bucket, the bucket of cost that could cause an existential risk to ODEC and its members; the cost incurred for energy services provided, especially during periods of sustained prices caused by extreme weather, cyber events, et cetera.

ODEC and its members are working with large-use customers, and transmission owners, PJM, and likely FERC, to establish the following: One, shorter billing cycles. I haven't talked about that yet today, critical point. We should synchronize collection of passthrough costs by matching the billing cycles of PJM to ODEC with the billing cycle of ODEC to the member distribution cooperative and the member distribution cooperative to the large-use customer;

Two, security requirements for typical consumption of energy capacity and transmission services and are formed readily and easily accessible to the cooperative baseline service collateral security;

Three, expedited processes to address disputes with ongoing payments required during any

dispute resolution process. Given the size of bills that could occur, delay in payment can create the substantial risk;

Four, coordination during economic emergencies such as extreme pricing to reduce load through backup generation, recycling down local operations, or requiring the posting of additional security in the middle of that crisis, originating with the large-use customer to support continued, market power purchases.

And lastly, five, mechanisms to ensure that utilities are never at risk of being obligated to continue to deliver and incur the cost of service to a large-use customer in the event of actionable or reasonably anticipated default, nonpayment for financial or physical system emergencies.

Many of these risks mitigation rules are being deployed through contracts and related tariffs, but the consumer protection needs here are significant. And ODEC believes regulation will be required to help ensure that contracts are negotiated with sufficient consumer protections; especially terms that apply to financial and operational emergencies involving sustained high prices and when the grid experiences reliability stress.

And any rule-making proceedings before the Commission are on a case-by-case basis when evaluated energy service agreements and related tariffs. We ask you to establish appropriate guardrails, consumer protections, and required coordination among all stakeholders.

ODEC appreciates the opportunity to participate in this technical conference. I hope to answer any of your questions today. And as we move forward together on this topic, I hope that ODEC can be a resource for you and your staff. Thank you.

JUDGE BAGOT: Thank you.

Ms. Robb.

MS. ROBB: Thank you. Good afternoon, Your Honors. I'm Cliona Robb and I am here on behalf of the Virginia Manufactures Association. We very much appreciate the opportunity to provide the VMA's perspective.

The VMA represents the 4,511 factories in Virginia that have historically been the largest electricity consumers in Virginia. These industrial customers account for approximately 239,000 direct jobs in the Commonwealth. VMA looks at all energy policy from four perspectives: affordability, reliability, security, and environmental sustainability. The cost

allocation issue being considered by the panel number 2 plays a key role in affordability of rights and total cost for industrial customers.

VMA members are part of the rate schedule GS-3 and rate schedule GS-4 class that serves -- that also serves data centers in Dominion service territory. And they're part of the similar rate class that serves data centers in APCO's service territory.

As indicated by Mr. Gaskill, it is the GS-3 and GS-4 rate class that are being assigned a greater proportion of costs related to generation and transmission associated with meeting data center load.

Based on this Commission's November 1st status report on the implementation of the Virginia Electric Utility Regulation Act, Virginia is far from being the number one state for affordable electricity rates in the southeast.

According to the FCC's 20 peer state analysis, Virginia Investor Utilities rank number 10 and number 18 out of 20. That is the status quo for cost allocation of generation transmission and distribution for retail electric customers in Virginia. That's what it's done for industrial customers.

VMA looks forward to providing more comprehensive analysis of cost allocation issues in the

written comments that Commissioners called for following the issuance of the transcript in this proceeding.

At this point, the Commission believes that the Commission has the requisite tools to address cost allocation issues that may arise due to data center load. For instance, you have Dominion's upcoming biannual review that may provide an opportunity to do that for Dominion customers. Also, the VMA notes that NOVEC in its comments for panel number 3 today has indicated that its tariffs provide sufficient authority to address data center issues without having a separate affiliate. And the VMA looks forward to exploring whether electric co-ops already have the necessary tools to address data center issues.

The status quo for cost allocation of generation transmission and distribution for all retail customers in Virginia is that costs for facilities located on the customer's premises are generally assigned to the individual customer. And costs for facilities located or off the customer premises are generally socialized, meaning they're spread out amongst all rate pairs.

In contrast, cost for generation in transmission located outside -- so the logic behind

this approach is that all customers benefit from the existence of generation of transmission facilities. It is not fair, and it would not be affordable for a new customer to pay for an entire new generating facility simply because that new customer's load meant that the system load exceeded the amount supplied by existing generation facilities.

Similar logic applies to new transmission facilities. The electric grid, as a whole, benefits from having sufficient transmission facilities. And when a new customer results on the loading on a transmission line exceeding the rating of that line, it is not fair and would not be affordable for the new customer to pay for an entire new transmission line.

However, it is undisputable that the -- that the location of renewable energy generation assets to meet the Virginia renewable portfolio standards have and will result in over 12 billion in transmission costs alone by 2029.

So the business as usual cost approach to cost allocation is being questioned by some due to Virginia Utilities being faced with large amounts of load being added in fairly short time intervals.

There are upsides and downsides to this situation. The upside is that having new load allows

fixed generation of transmission costs to be spread out amongst a larger customer base. The downside is that adding a significant amount of new generation and a significant amount of new transmission in a relatively short period of time results in higher amounts of costs being spread out.

So regarding the potential up-turners to current rate design and cost allocation, VMA does not believe that any drastic departure from the current rate design of cost allocation is needed. Basic principles of rate design that were discussed today in Panel Number 1 are sufficient when coupled with the expertise within the Commission to properly address any alternatives to the current rate design in cost allocation.

The VMA is very interested in learning more about the pros and cons of how other states have addressed these issues. In this panel, Google's written statement refers to a proposed settlement being considered by the Indiana Utility Regulatory Commission, which the VMA believe refers to cause number 46097 before the Indiana Commission.

For instance, we'd like to know how does this proposed settlement impact industrial customers in Indiana? And does it provide any remediation for the

possible issue of stranded transmission costs that Commissioner Towell raised in his questions for panel number 1?

But above all, with any solution that is considered by the Commission, we ask that you first do no harm to existing customers, like the industrials that are already being -- experiencing increased costs due to data center load. Thank you.

JUDGE BAGOT: Thank you.

Mr. Kroboth?

MR. KROBOTH: Yes. Thank you, Your Honors. Like my colleagues, I wish to thank you for your leadership on this topic before you today. My name is Joe Kroboth. I am a Deputy County Administrator for Loudon County where I oversee community development programs.

My written testimony has been submitted and I would like to paraphrase those comments into three specific issues for the Commission to consider as you develop your strategy for large-scale or hyperscale electric customers.

The first relates to the allocation of infrastructure cost to high-usage entities. Currently, a significant portion of new electric utility infrastructure costs are distributed across all rate

payors regardless of their usage. This structure could disproportionately impact residential or small business rate payors when considering the hyperscale user and the significant infrastructure investments that will be needed to sustain their growth.

I propose the SCC revisit the framework to ensure that hyperscale users such as data centers bear a greater share of the infrastructure cost they drive. This adjustment would promote fairness and reduce the burden on ordinary customers.

Second is mitigating the impact of rapid rate increases. Over the past several years, nationally, residential electric bills have experienced steep increases with examples such as the 53 percent rate rise observed in Ohio being a cautionary tale for Virginia.

I recommend the SCC review mechanisms to limit rapid rate increases, including implementing caps on phase adjustments. These measures could provide rate pairs with predictably and protection against excessive financial strain.

And finally, addressing aesthetic and environmental concerns of new generation and transmission infrastructure expansion. The expansion of unsightly overhead infrastructure has been a growing

concern for localities.

I urge the SCC to require utilities to priorities undergrounding for developed communities or alternative solutions such as reconduct or -- and voltage conversions to increase capacity that would minimize the visual and environmental impacts of new infrastructure projects. Such initiatives would not only enhance community esthetics but also improve resilience against weather-related outages.

I do wish to thank the Commission again for your leadership on this important topic and to state that representatives from the localities across the Commonwealth are available to assist the SCC as you might deem necessary.

JUDGE BAGOT: Thank you.

Thank you all for those opening remarks.

So jumping into questions, I'm going to kick us off. I'll start us off with one which has been touched on a little bit in everyone's opening remarks but I'm going to ask it again and see if I get a little -- a little more in depth here.

So I wanted to start with looking at the -- one of the conclusions that was made in JLARC's recent report that was issued with respect to cost allocation. So I'm going to try and summarize it, but I'll

summarize it poorly.

So the conclusion was up to date, our current cost allocation seems to have been working appropriately with respect to GS-3 and the GS-4 customer classes.

Going forward, there seems to be a little bit more uncertainty raised by the JLARC report as these larger investments are made in generation and transmission. The JLARC report suggests that this cost allocation may no longer result in fair and equitable costs among data center customers and non-data center customers, or between the GS-3 and GS-4 classes and other customer classes. So at a high level, I would like your thoughts on whether you agree with those two conclusions reached by the JLARC report.

And I'll throw into the mix an additional thought, which is we've heard a lot today about -- and in the prefiled comments -- about an interest in market-based rates to serve data center customers. To the extent that data center customers are able to avail themselves of market-based rates more readily going forward, and then may no longer be part of the GS-3 and GS-4 customer classes, do we risk additional cost shifts, or a lack of, you know, matching costs with costs causation as a result of more data centers moving

in under a market-based rate paradigm? So hopefully, all that makes sense.

Go ahead, Mr. Wilson.

MR. WILSON: Yes, great question. And, in fact, I wish I already addressed it in my opening comments. We've gone through a long period when there was excess capacity in PJM, and that's a time when capacity prices were low, energy prices were rather low.

In that environment, new customers are very, very welcome. They share in the costs of that -- the fixed costs of the capacity. And they don't have that much impact on prices. So that's kind of where we were as of now until, you know, we've got a high price that happened in the recent auction.

Going forward, now that we have some coal retirements, and now it appears we have about the system we need for the current customers that we have right now, especially if we put that coal back into the auction it looks a little better. But when we have the system that was built and paid for by the current customers, and it's kind of the right size, when somebody really, really big comes in and says, Hey, I want service, we're going to have a build something incrementally.

And that -- I agree with the JLARC report that that raises some questions. And the analogy I like is to the natural gas industry that FERC has kind of got right. If the power industry's been really a hard nut to crack, I think there are natural gas policies at work for decades. And there, if the system is kind of currently built for the current customers and fits them well, and some customers want incremental service, they go to the pipeline, the gas pipeline, and the gas pipeline says, Okay, I'll see what I can do, and I'll have an open season.

The gas pipeline holds an open season and if enough customers sign up for the expansion to pay for it through like 10- or 15-year contracts, typically, then the pipeline will say, Okay, I'm going to go forward with this, file it with FERC. FERC says it's needed. Because it's got customers, it gets built and current customers are pretty much unaffected by that.

So cost causation, as we have huge incremental costs to meet this highly uncertain incremental load, it may be appropriate to revisit these questions about cost allocation. Thank you.

JUDGE BAGOT: Mr. Gaskill?

MR. GASKILL: Thank you.

So let me start the JLARC portion of your --

of your question and then I'll get to the MBR. So I think largely we do agree with the conclusions of JLARC. And I think that's consistent with my statement there that, to date, we did believe that the current cost allocation methodologies are covering in, and data centers are paying their cost of service.

But as I said, looking forward to the future, we do have -- I mean there are going to be cost pressures going forward. So if you look at a JLARC, kind of, conclusion on that that, again, to date they're paying their cost of service. But they identified, I think, three areas where there will be cost increases due to a -- due to load growth that may be passed onto other customers.

And so one is just the amount of new generation and transmission that will have to be built to serve them. I think that that is -- that is self-evident. Again, I think largely our current allocation methodologies take care of that. I think mainly what might be different in the future from what has happened in say the last five years is two things.

One is the cost of infrastructure is just naturally increasing. I mean transformers cost more, land cost more, labor costs more. So just the cost to build has increased significantly over the last five

years.

And two, there is less -- I'll call it -- head room or margin in the system anymore. You see PJM reserve margins tightening. So that means every new increment of load is going to require additional generation. It can't be absorbed into the existing capacity system.

You see something similar on transmission. You see something similar on distributions where each of these new large load connections will require a substation. So any slack or margin in the system has been consumed for lack of better word. So that will drive additional infrastructure costs going forward that maybe we hadn't seen in the last, say, five to ten years.

And then we get to, again, the impact on the wholesale prices. So things that we are doing or as that we can do has a vertically integrated utility. And you look at our IRP, we attempt to, and we have for years, we want to be relatively balanced in our generation and load so that we are not overly dependent on the market. And that reduces market volatility in and of itself. It's never going to be perfect.

We are net purchaser of both energy and capacity. So for that open short position, we are

subject to the -- to the ebbs and flows of the market which, of course, now we've seen significantly increase recently. But to the extent that we can be relatively balanced as a vertically integrated utility and have our generation match our load, then you're less subject to the volatility of that market.

That also brings me to the market-based rate question. That is also, in my view, a way to hedge against from our system cost perspective, cost and revenues, hedge against the volatility of market prices. And in our current schedule, MBR -- so it's a generation-only component meaning for distribution and transmission they would pay the same as they would as a GS-4. But for the generation component of their rates, they would pay whatever the energy of the LMPs are -- if they had LMP -- and then whatever the capacity price is for their -- for their 5 CP demand.

So it becomes an effective hedge for all customers because as energy prices go up, of course that -- they will be paying more into the system. And so that becomes a hedge against our -- you know, any extra they're paying goes into our fuel factor currently.

So that would, as market prices go up, of course our fuel prices go up, but they are paying more

into the system which then counteracts that. So it's a very effective hedge against our purchase power cost but it's for energy and capacity. So we, again, probably coming to a biannual review near you, but would be proposing to extend that market-based rate schedule.

JUDGE BAGOT: Thank you.

Mr. George?

MR. GEORGE: Yeah, so I think to the question on JLARC, you know, looking at everything that went into the assumptions in forming that recommendation in JLARC, I think it's difficult to argue with that outcome. Clearly, as we've heard and as we're seeing, we're seeing a level of incremental investment in the system to serve our load we simply haven't seen in years. And so I do think it's fair game to think about what those policies need to look like moving forward.

I would say though -- and this goes back to the -- to the assumptions within JLARC and this gets to a comment Mr. Wilson made -- it is critical that we get the input to the forecast right. And I think this was talked about extensively this morning, but the infrastructure signals that are being sent either by PJM's markets or through integrated resource planning, those signals are only as good as the forecast that

underlie them.

And so I think this really does go back to the point around more stringent upfront and over the term of the contract financial requirements on the large-load entity coming to the system. And so I think if there's a way that we can reduce the amount of risk being placed on the utility and their customers for the investments to serve our load, I think that mitigates some of the uncertainty and helps address some of the cost allocation concerns.

And so the other point on this is that we've talked a lot about cost allocation, and we'll do so for a long time. But before we start to think about how we might need to change allocation of costs, we need to think about cost reduction opportunities, right? There is a lot out there today that I talk about in my testimony that can really lead to meaningful benefit in the near term at a cost that's far lower than investing in new infrastructure.

To be clear, we will need new infrastructure. I'm not suggesting that we delay that bill. But what we should be doing is maximizing every bit of the existing infrastructure we have today. That is through things like demand response, increased flexibility. Right?

It's also through investment in energy efficiency. That can occur well beyond the fence line of the data center facility, and we have examples that show how we've done that. Right? And so I think, again, looking at where we're heading, we do see a significant amount of infrastructure required. Let's focus on minimizing the cost of that infrastructure deployment and then turn to cost allocation.

The final point that I would make, and this goes to the -- to the retail choice discussion. So as a customer in Virginia right now, we do have accounts that are served both by the incumbent utility, but we also have accounts that are served by a third party generation supplier. I think having both of those has served as a bit of a hedge for us internally. It's also managed us to more aggressively go out and precure the types of resources that we want to serve our load going forward. Right?

I think we do see the need for increased partnership with our utility partners to make sure we're investing in the right resources going forward. But I would add on the risk point, there are pretty significant provisions that exist in code today. So for example, if you're a shopping customer, you have to give the utilities significant notice before you come

back to the system.

I think -- I think we would want to see those type of protections remain in place as a way to avoid shifting between the two types of customer classes. Thank you.

JUDGE BAGOT: Thank you.

Mr. Robb?

MR. ROBB: Thank you.

So with respect to the transmission cost -- and I certainly want to echo what Mr. George said about trying to reduce cost in total. Now ODEC's members, and their member owners, are largely a taker of transmission costs. We own 110 miles of transmission line, the least ensured, but, you know, we are a transmission customer of Dominion.

My understanding is that, you know, on the sort of low side of the transformer, right, you've got new interconnection cost and those could be directly allocated to the large-use customer. There could be some excess facilities that could be constructed. They would also be allocated to the large-use customer.

But everything on the high side of the transformer is going to be part of the PJM supplemental process transmission allocation. And for, you know, the, sort of, interstate highways, the 500 KV lines or

the 745 KV lines that we're starting to talk about, they're going to be allocated PJM line.

And then there's a group of costs that are going to be allocated throughout the Dominion transmission zone. If we're thinking about upgrading the entire 115 KV system to 230 KV, all of those costs are going to flow through all of ODEC's customers, both under the formula rate and under a market-based rate passed through for large-use customers.

We're open to exploring ways to identify costs that are directly attributable to data center customers or other large-use customers. And to start to think about, you know, how those costs could be allocated specifically.

I agree with Ms. Robb. There are some general benefits, but I don't think it's a hundred percent pass though of the cost allocation. Probably some reliability gains when you're upgrading the system like that.

You know, both when it comes to transmission costs -- and I kind of look at our financial projections headed out, you know, for ODEC's balance sheet, transmission costs are a large future cost increase in some things that we really want to work hard without all and FERC to manage.

Sort of moving from transmission into capacity and energy, and I'll echo Mr. Gaskill's comments. We, as a utility, try to balance for capacity our load in our generation. And we've worked for 40 years to create this asset-based that really detects the capacity.

When PJM recently ran their capacity auctions, you know, thankfully, most of our members and member owners were highly hedged in that capacity market. Some 90 percent of our capacity obligation is made up from our generation resources. And now sort of allowing the few large-use customers that come in and take that benefit, we think that that would be unjust and unreasonable outcome.

So pointing those customers directly to the market, allowing them to use the financial hedges, and relying on the diversity of the PJM fleet, we think that that's the right answer for new customers locating in Virginia.

And then, of course, with respect to cost allocation risks and, you know, we applaud JLARC and Mark and others who spent a lot of time on that report. They engaged with us, and we engaged with them, and we thought that outcomes and recommendations were outstanding and appreciate that.

One of the cost allocation risks that is magnified given new extreme weather, you know, the increased potential for cyber-attacks, the resource scarcity that PJM is predicting as soon as 2027, you know, where you have potential for huge energy bills, and defaulting end use customers under our existing framework, the cost allocation mechanism is to shift that to other costs, right?

We operate at cost recovery. The only way that I can recover cost, ODEC can recover the cost is from our other members. So we don't think that the current framework without additional regulatory guardrails is sufficient to protect Virginia consumers.

JUDGE BAGOT: Thank you.

Ms. Robb?

MS. ROBB: Commissioner Bagot, you talked about JLARC saying that the cost is being assigned to GS-3 and GS-4, and so right now that works out fine. I do want to stress to the Commissioners that there's not just data centers on GS-3 and GS-4. There's other customers including industrial customers, so don't think that, Well, fine if most of these costs are going to GS-3 and GS-4, problem solved. It's not. The industrials are really asking you to focus on that point.

And I would join in Google's response that give customers the choice as to how much risk they want to take on. I don't think that hurts utilities. I think it helps utilities. If customers want to shop, go out, they have -- they have a five-year stay out. The utilities can make them stay out for, you know, five years' advanced notice.

I think there's more than sufficient protection for utilities with that 5-year stay out provision and I think that it takes the stress off. That utilities don't have to build a bunch of new generation if customers just have decide to take the generation risk upon themselves either through a sleeve with the utilities through market-based rates or simply going through third party suppliers.

JUDGE BAGOT: Thank you.

Mr. Kroboth?

MR. KROBOTH: Thank you, Your Honor.

I have no reason to question the JLARC analysis suggesting that data centers are covering their own fair share. But I would caution that our current state may not necessarily be consistent with our future state. And JLARC also suggested that between 16 and $18 billion of additional transmission line investment is needed by the year 2040.

Also, they indicated that new transmission facilities, in order to meet the demand, will need to open once every 1.5 years to meet that demand. So JLARC has suggested that a concept where data centers should be their own customer class, and I believes that's worthy of your evaluation.

Also, the Commonwealth is not necessarily a one-size-fits-all when speaking of this issue. So in Northern Virginia, the system that we have is not adequate for our existing customers. We have sufficient capacity, but we have reliability nonconformance problems that are causing Dominion Energy Virginia to make significant investments to meet those reliability standards.

So as data centers grow throughout the Commonwealth, so will come those potential needs to meet the reliability standards for PJM on their existing infrastructure and need to operate that. Thank you.

JUDGE BAGOT: Thank you.

JUDGE TOWELL: I have a quick follow-up question to Judge Bagot's when it comes to the JLARC study. I agree that I thought the JLARC study was quite well done. And, frankly, in a relatively quick turn around even with the 11 or so months that --

sorry, fewer than that -- that they completed that task. And I appreciate you all providing your perspectives on that report.

The flip side of that is, you know, no one group, even the experts that were working on the JLARC report, can get everything right given their broad base of just what they have to deal with from one day to the next.

So what in the JLARC report to the extent that you have kind of gone through it in depth, do you believe maybe either have gotten it slightly wrong or a misunderstanding, a misalignment? Or any other aspect of it that you think would be important for the Commission and just the general public to be aware of?

Ms. Robb?

MR. ROBB: Yeah. I think that their discussion of collocation, I think, could have benefited from talking to parties that are already doing that. VMA members are doing a lot of that already and were, you know, a little surprised to see that written up but without, kind of to our knowledge, our input on that. So I think the collocation discussion could have been more informed.

And again, I don't -- I think they were more critical of competitive supply than I think is

warranted. I see competitive supplies as solution as a possible way that will alleviate stress on the system rather than create stress on the system.

JUDGE TOWELL: Thank you.

Mr. Wilson?

MR. WILSON: Oh, sorry. I think it was --

JUDGE TOWELL: You're right. Sorry, go ahead. Mr. Robb.

MR. ROBB: Well, we're all too polite here in Virginia.

There's been some discussion of Virginia's Clean Economy Act in the JLARC report as it relates to elective cooperatives. And while portions of the Virginia Clean Economy Act does not apply for elective cooperatives, the mandatory retirement of fossil-based resources in 2045 to 2015 most certainly does. And as we plan for new generation of assets, that's something that we focus on. I'm not sure if the report got that part exactly right.

JUDGE TOWELL: Thank you.

MR. WILSON: Yeah, just a couple things in there come to mind. I've got some notes somewhere else. But one, there was some suggestion that demand response for data centers would maybe only be a small fraction. I think there may have been somewhere else

where they've talked about the possibility of data centers having backup generation that was fully dispatchable.

But all the -- all the data centers have diesel backup, hundred percent, because as it's been suggested, they want total reliability for their customers. But if that backup generation is a clean fuel dispatchable, then that data center is potentially a hundred percent dispatchable from the grids perspective. It can run its generation for a hundred percent. So it seems like they might have kind of undervalued that a little bit.

And then the only other thing I'll mention that kind of was a chuckle for me is where it says, stranded cost, in the JLARC report, it often says, Stranded costs recovered from customers. And I'm like, Wait, that's not what a stranded cost is. A stranded cost is a cost that is stranded. Typically, a stranded cost is one that stays with the utility, who probably should have signed a contract with somebody in order to not get stuck with those stranded costs.

And so that brings me back to what I think is one of the greatest things that you could do is to make is clear whether, you know, the utilities are going to be permitted to recover these costs if they get

stranded. Because if you say, no, they will go back to the data centers and say, Look, I'm sorry. You know, I can't take this risk. You're going to have to either have dispatchable backup generation or sign a long-term contract with lots of skin in the game. And that would also improve our load forecast because I suspect quite a few of the projects might shrink or go away if they were required to either be self-providing reliability or to have serious skin in the game. Thanks.

JUDGE TOWELL: Real quick before you go.

Mr. Wilson, you -- this is the second thing you refer to, I believe, a clean, dispatchable generation. Could you just, for the benefit of everybody, explain exactly which forms of generation you're referring to?

MR. WILSON: Well, the -- in the industry talk, they talk about renewable natural gas, for instance. It could be just batteries, hydrogen someday.

JUDGE TOWELL: Okay.

MR. WILSON: Maybe for the meanwhile, natural gas. I mean that would be better than -- yeah, natural gas would be, kind of, permitted in the -- in the near-term just to get us from here to wherever.

JUDGE TOWELL: Thank you.

Mr. Kroboth, I believe you echo.

MR. KROBOTH: Thank you, Your Honor. First, I would offer my compliments to JLARC on what I believe was an excellent study based on their research. And I believe it creates a very road map for the general assembly, moving forward, as the Commission and the general assembly attacks this issue.

One particular issue that I was very glad to see is a recommendation where JLARC suggested that the general assembly clarify the authority for utilities to delay but not deny connection to their system. I believe that that is an effective tool. I believe we heard Mr. Blackwell made reference to that, how customers ramp up over time. And I know that that tool used is widely and loudly as we attempt to catch up with our infrastructure.

So the market is reacting to that delay. In regards to your question about -- or comment about onsite generation, we are seeing new data center developers build their own on-site complete generation using gas turbine generators coupled with diesel backup generators for those to -- so they can bring that data center online in advance of even being connected to Dominion Energy.

JUDGE TOWELL: Thank you.

JUDGE HUDSON: So, Mr. Kroboth, if I can just start with you. But I also would like to see if some of the other panelists would like to respond to this question.

You talked a lot about the separate rate class and so I think what would be helpful for me is if you are able, just kind of describe a little bit more of what would the criteria be for determining that class responsibility? And also, are the ways to adjust the restore to kind of insulate the disproportionate cost increases?

MR. KROBOTH: Thank you, Your Honor. I do not want to profess to the Commission that I'm an expert in rate analysis. But having conducted my own research on this issue, it seems to be a common issue that comes up across the country and it's reiterated in the JLARC report as well.

I believe creating that separate customer class and define what that threshold would be whether it's 25 megawatt, 50 megawatt, 100 megawatts or more, would help to distribute those costs.

MR. GEORGE: Yeah, no, thank you for the question. So I mean I think a couple thoughts. Your know, first off, I think there has already been discussed several different ways that we can start to

think about a more appropriate balancing of risk moving forward. But I also just want to be very clear that, you know, in our view we do see a industry-specific rate class as discriminatory.

I think we have seen proposals elsewhere, both at the state level and at the federal level, that have been rejected on the grounds that they are discriminatory. Right? The instances that we have seen have tied cost allocation in the form of a rate class to a specific customer based on the use of electricity that that that customer is demanding.

Again, that -- that's not how we have seen rates structured ever. And our concern is that if we start to go down that road, that is a significant departure from sound utility rate-making practices that we have seen to date. Right? And once we start going down that road, it does become a very slippery slope for how we can stop. Right?

If we assign it to one particular industry, how do we not assign it to another? And so I think while it is appropriate to have the conversation, right, about whether or not we should consider an additional rate class, I just want to be clear upfront, that is our perspective.

Second to that, again, just to be clear, if

we're going to have discussion about a separate rate class for purposes of cost allocation, that should occur in the appropriate venue which in our view is in a rate case or some formal proceeding before this Commission.

So with that said, I would also note within the E-3 report that was part of the broader JLARC analysis, there is a slide -- 109, if you make it there -- that has about seven different ways to impact rates moving forward. And so this is through cost allocation adjustments within the current framework, a weight list for service that I think my fellow panelists have mentioned, additional service commitments through increased financial requirements that we've talked about.

But what's interesting about the graphic -- and I have it on my computer. I'd show you, but I'm not connected -- it's broken down in a fairly straightforward way. And I think what's telling is that when we start to get into a more direct discussion of cost allocation, right, that tends to be kind of the last resort. Right?

There's -- everything in the middle offers potential benefits and additional tradeoffs to other customers or other participants in a way that that may

not. And so I think there's -- that's all an effort to say there are several things that we can and should be considering before we get to that point.

And while I have the mike, I do want to go back to a comment. This is in response, Judge Towell, to your last comment.

I think one thing that JLARC -- and this is -- this is not a criticism, a mere observation. The JLARC study assumes a static environment. Right? It assumes there will be no regulatory change. There will be no market price change. There will be no other changes that could impact development in going forward.

I think we all recognize that's not the case. We are price sensitive business customers. We respond to market signals and so do our peers. And so it's hard to say how that could have been done differently but I just want to caution that those are static results, and we do change our behavior based on market conditions, something to consider.

MR. GASKILL: I'll just add to that a little bit. I largely agree with what Mr. George said. Excuse me. So the -- sort of the framework of creating a separate class, a new rate class going forward, a lot of pros and cons there. A lot of different levers we can pull that are somewhat interrelated that you've got

to think about.

So I think the first thing we would start with is what is the purpose if we are going to go down in creating a new rate class? Like what problem are we trying to solve and I think you start there. So if the problem we're trying to solve isn't -- and I can see a couple of -- couple ways to go here -- is the incremental costs that -- to usurp the new load.

So typically, and I -- and I would agree with Ms. Robbs comments. We typically don't direct assign cost on an incremental basis. Everybody pays their share of system. So customers today benefit from the nuclear power plants that were built in the 80s and so forth.

So we don't typically direct assign on an incremental versus average cost basis. Where we might direct assign is if there is infrastructure that only that customer or only that customer class is using or benefiting from. So maybe a good example might be a substation, so I'm building a new distribution substation to connect this new customer. For intents and purposes, they're the one that's using it. That might be a category where you directly assign.

Generation, much more difficult to do that. Everybody kind of pays their share of the system.

Transmission, maybe somewhere in the middle. There's probably some regional-type projects everybody's benefiting from. There might be some -- Mr. Blackwell mentioned, you know, an example where I'm going to build a half-mile line to connect a new data center. That's kind of somewhere in the middle.

So but that's -- when we think about direct assignment, that's where we're usually going. Not on an incremental versus average basis, but who's benefiting from that particular resource. So are we creating a separate rate class to direct assign costs, yes or no?

The other, I think, sort of, thing to talk about is, again, data centers are part of our GS-3 and GS-4 classes. What effect is that having on the industrials, the non-data center customers within the GS-4 class? So, as I mentioned, just taking transmission as an example, residentials been flat to even decreasing while the GS-4 transmission costs have been increasing. So if you're an existing industrial, you have been -- you're seeing higher transmission costs over the last four to five years.

So what effects -- if we broke out, untangled the GS-3 and GS-4 rates or -- into a separate -- what effect does that have on various customers? So that's

something to really consider.

And what you don't want to do and, you know, I tend to agree with Mr. George. We typically would not create a separate class based on a particular industry or particular end use. We typically look at their load characteristics. So do you create over a certain size, over a certain load factor?

And so how you slice and dice that becomes very important because you could end up pulling -- and there's a lot of industrials that look like data centers. They're running 27/7 operations, three shifts, they have very high balloon factors, very large. So how do you sort of slice and dice that new road -- load class, rate class to not adversely affect them and it's sort of the do no harm, so.

The other options are through contract minimums, through rate design, through other mechanisms that, I think, can get largely to a similar place without having to create separate rate classes. But I think those are all options on the table, and as I said, there all levers that you can pull that affect each other. So you kind of -- you wouldn't want to do one in isolation over the others, so.

JUDGE HUDSON: Thank you, Mr. Gaskill.

All right. Mr. Wilson?

MR. WILSON: Yeah. I want to respond to Mr. George's talk -- discussion of discrimination. I agree with you so -- on so many things. But this is one where I really think discrimination, yes; undue, not really, if you created a separate rate class for the data centers.

First of all, the aggregate numbers are so huge. And the numbers for other very large loads, industrialized manufacturing, or something like that, are by contrast just tiny. Of the load -- of the large load forecast that PJM received this fall, 97.5 percent of the megawatts was data centers. The other 2.5 percent was a little bit of electrified manufacturing or poor electrification. So it's the data centers that have come on so suddenly in just a couple of years and are raising all these questions of how are we going to build them.

Secondly, in terms of economic development, we've heard that data centers represent economic development. But when you look on a -- on a per megawatt basis, the amount of economic development from, say, an electrified manufacturing facility, is much, much higher than a data center. The one thing we can criticize the data centers with is creating a lot of traffic, okay?

Third, as I mentioned before, the data centers are being built by the -- especially a few large parties in various different areas and if they can't get the power here, they're going to build it there. So there really is some flexibility of how fast they move in different places. And that creates the opportunity that if you were to require them to have, you know, renewable backup generation or to sign a long-term contract, they might do it or they might just kind of shift their next round somewhere else, but it wouldn't be a horrible thing to do.

Whereas, if you did that to an electrified manufacturing facility, you'd hate to lose it because of all the jobs that it would bring into Virginia. So you might push the data centers around a little bit, but you probably wouldn't want to do that to the manufacturing.

And then the other thing is, is just that the data centers are so uncertain. If a electrified manufacturing facility chooses a location in Virginia, they probably chose it based on many characteristics including power. But they're probably really going to do it, you know, once they've got the land and they're starting to build. Whereas the data centers, the future of them is much more uncertain.

JUDGE HUDSON: I see a rebuttal from Mr. George.

MR. GEORGE: I can't resist. You know, I -- you know, just a couple thoughts. I mean, the first is we have never tied the provision of retail electric service to jobs per megawatt created. And so, again, it's unclear what benefit that adds, and so I would just caution that that does start to go down a path.

Again, what we have heard, the two-date existing things have worked well for allocating costs and going forward, there is potential for infrastructure investment to benefit all customers and so that's the first point.

The second, I just -- I have to touch on the economic development piece briefly. We are a member of the Data Center Coalition. One of my colleagues presented this morning. But we had a roundtable discussion a couple months back and there was several data center companies there and several labor community members there. People who go out and actually, you know, build facilities at our sites, build our sites.

And at one point, someone from the discussion made a comment about the fact that our industry has been providing six-figure blue collar jobs 45 minutes from the nation's capital since 1997, that is economic

impact.

And so I just -- I don't think it's really beneficial for anyone to go down this road where over time pursuant to Provision 2, the benefits of providing to the economy because we have demonstrated that we are providing significant economic benefit and we're continuing to do so.

JUDGE HUDSON: Ms. Robb?

MS. ROBB: Yeah. I think it's important to look at economic development in the largest sense; so economic development both in terms of, you know, inviting new economic development into the state and economic development in terms of retaining the development that we have already.

So I do think that, you know, to the extent that you have on GS-3 and GS-4, both data center load and industrial load, to the extent that industrial load is, you know, arguably being impacted by the data center load more than it's impacting other customers, and that that could drive out -- either impede growth in the industrial sector or reduce existing industrial activity, I think that's a consideration.

If you're looking at economic development as part of the, you know, why we do -- why we, for instance, as Mr. Gaskill suggested, look at rate

design, that you look -- you look at it in the broadest sense. And I think the broadest sense would include not only not increasing in -- making life easier for industrials, but making sure we hold on to the industrial load that we have.

JUDGE HUDSON: Mr. Gaskill?

MR. GASKILL: Just very briefly. I just -- I did want to mention we do have an economic development weight. It's a -- it's for new customers. It's about a five-year discount of base rates. I only say that it's based on capitol investment or the number of jobs they're creating. I just say that it's not unheard of to have a tariff based on economic development.

JUDGE TOWELL: Quick follow-up for Ms. Robb.

I noticed in your prefiled testimony, Ms. Robb, you referred at some length on the job component of a differentiation between, what I'll call, traditional manufacturing and data centers. You did not mention that in your opening today. And separate from the employment piece, although I'm certainly interested in your thoughts on that.

MS. ROBB: Mm -hmm.

JUDGE TOWELL: What other characteristic do you see that differentiate VMA's clientele --for lack of a better word -- from the data center construct?

MS. ROBB: So in -- other than the job component?

JUDGE TOWELL: Yes, ma'am.

MS. ROBB: The VMA -- the manufacturers have become parts of the community. So to the extent you have school, you know, they support the schools. They provide --

JUDGE TOWELL: Well, -- sorry, let me --

MS. ROBB: Sorry, sorry.

JUDGE TOWELL: I'm sorry to cut you off.

MS. ROBB: Yeah.

JUDGE TOWELL: But just to clarify a little bit, kind of the objective measure that, say, regulators could take into --

MS. ROBB: Yeah.

JUDGE TOWELL: -- account in reflecting on Judge Hudson's question. What is it about data centers that differentiate them from manufacturing facilities from a rate design perspective or a customer class perspective using tools that we have more traditionally --

MS. ROBB: So what you're saying -- you know, Mr. Gaskill just pointed out that they do have the economic development weight, which takes into the impact jobs. But other than that, what -- from a rate

design perspective?

JUDGE TOWELL: Or form -- yes. What --

MS. ROBB: Well, the --

JUDGE TOWELL: -- what makes them different from your -- from the --

MS. ROBB: Yeah.

JUDGE TOWELL: -- VMA?

MS. ROBB: Yeah. Well, I think that, you know, we've talked throughout this -- these panels about the amount and the rapidity of the way the load was being developed. So when you have an industrial client come on that's a long-term load ramp and it's not happening everywhere all at once. I think what distinguishes the data center situation is that you have a lot of -- magnitudes of load. They -- you know, bigger than most any industrial you see and it's coming on very quickly and they're all coming at once. They're coming in clusters.

So I think just the sheer magnitude of the way this load is coming on the system is what's, you know, kind of questioning whether we need to look at rate -- you know, changing business as usual just because we -- something the system hasn't done before. So industrial load comes and goes, but when it comes and goes it does not have the same magnitude of impact

that the data center load is having right now, so it's just the sheer numbers.

JUDGE TOWELL: Thank you.

JUDGE BAGOT: Can I jump in and ask a follow-up to one of Mr. Gaskill's comments?

And then, Mr. Robb, I'll let you jump in as well.

So I just wanted to go back quickly to the discussion that you were having about, you know, what was the goal to the extent we have a separate customer class? And if we're -- if we're not looking to direct assign costs, are there other tools like contract minimus or rate design that we can use to appropriate out -- appropriately allocate cost without including this separate customer class that we could directly the assign the cost to?

I'm going to bring that back to an earlier comment that Mr. Robb made about particularly the issues with respect to the transmission investment that we're seeing, and how right now there doesn't seem to be a great tool if you're looking at just coincident peak methodologies potentially for recognizing that the benefits that certain customers do or don't receive in comparison to the extent, or the magnitude, of the transmission investment being made.

And I was trying to come up with some sort of hypothetical. I didn't do a good job. But for me, sort of what I was thinking of is if I lived in a house with a bunch of roommates and we did a -- you know, renovations here and there to the house, we all generally benefit from those renovations.

If one of my roommates, or two of my roommates, decide to open a baking business and we knocked down and rebuilt our kitchen to three times the size all at once at a significant cost, yes, I might marginally benefit from having a bigger kitchen and a little more storage space, but are those benefits truly being accounted for appropriately in our current ways that we cost allocate?

So my question to you is if we don't have a separate customer class -- or could that be addressed through a customer class? And if that's not appropriate, how do we get at those issues through a contract minimum or rate design?

MR. GASKILL: Yeah, that's a very good question. And it's a transmission cost too. Like I said, distribution, I think you can to some extent, you can start to say, these -- this infrastructure is for this customer. Generation, sort of the other -- the other end of the spectrum period, where transmission,

somewhere in between.

So I don't think there's any doubt that there's additional transmission infrastructure being built that would accommodate the new load growth. And so I kind of put them in two different -- well, really three different buckets when you think about transmission. It's been one of the larger regional projects. I think that it's very difficult to direct assign. I mean you begin to think about that, you would do that because that's really looking at regional wide.

It could -- certainly load growth plays a part in it, but it's also generation retirements that may or may not be in our state. It can be solving West to East transmission flows, you know, a bit more interface transmission constraint-type things. So those are very difficult, I think, to say it is attributable directly to this particular customer or customer class although we just inherently do know that the load growth is contributing to it.

There are -- and a third category would be end-of-life-type of projects. Those are basically existing lines you're going to reconduct or you're going to rebuild. That, by and large, would have to be done regardless. I don't think that's a direct

assigned type issue there.'

The ones where I said it gets a little -- and I think getting to your roommate analogy is these new delivery point requests. That's somewhere in between, right? So I made a 300 megawatt delivery point request, and I've got to build one-mile transmission line back to the existing 230 KV system, okay? So I've got one mile at whatever cost.

It's clear I'm -- we're doing that primarily for that new delivery point and that new data center or park could be -- doesn't have to be a data center. But where that gets a little tricky, too, I think is, well, nothing's to say I build that one-mile line, the next customer can come and connect on that line. And that could be a data center. It could be industrial. It could be a neighborhood. It could be a, you know, a strip mall, whatever.

So, yes, I mean I built that one-mile line for this delivery point, but they don't necessarily be the only ones to benefit from it over its 50-year life. So how do you -- that's where it's that one's kind of in between. But that could be, right, if we were to create -- so well, let me back up.

So currently what happens, even all of those, the regional, they end-of-life and those-- and those

secondary lines, those are all going to be part of the FERC formula rate and get socialized. I think there's some of the discussion in the first panel about that. If it's a large regional 500 KV and above, it'll get socialized partially across PJM. And, of course, so there's some sharing. We also get shared upon from other costs outside that comes in.

And then within the zone, it'll get allocated based on the 12 CP basis to the various LSEs, so the NOVEK, and ODEC, and competitive service providers. And then what you're left with is what's allocated to our customers. So it would be roughly 80 percent or so of that and then we would recover that from our retail customers. So, but currently those projects are not directly assigned either at the FERC level or in our retail level.

JUDGE BAGOT: Mr. Robb?

MR. ROBB: Thank you.

So back to thinking for a second about differentiations among different types of customers and ODEC certainly raised it. You know, this has been made against customer classes based on, you know, a legal data center. You know, it could be unlawful if it fails to appreciate the diversity among data center customers.

You know, our member owners serve substantial amounts of manufacturing loads. You know, I think Mr. Hewa said it best. You know, all customers are good customers, and we tend to think about things in terms of risk profiles. And I think -- Mr. Towell, when I think about risk profiles, I -- a few things come to mind.

One is the extent to which the load is interruptible. You know, crypto mining facilities, manufacturing facilities; I can't imagine that they will continue to consume the amount of electrons that are required during winter storms or cyber events.

Data centers may still continue to do that. And the PJM's interconnection, you know, air traffic control system, our systems are mostly in data centers, hospitals, you know, other systems. So the interruptability of a load and the ability of that load to utilize backup generation during those peak times, I think that's a critical part of a risk profile.

Another aspect of that would be credit worthiness. And some of the data center customers and the structures in which they're using, you know, they -- they've got the marquee names on the energy services agreements. You know, others are taking approaches much like real estate developers where you're taking,

you know, single purpose bankruptcy remote LLCs and creating, sort of, downward structures, and maybe there are different aspects of credit worthiness.

So I -- we tend to look at it more in terms of amount of load, load ramp, interruptability, and credit worthiness in order to develop a risk profile. And we would try to treat a data center -- or a large-use customer -- we'll be intentional with the term -- a large-use customer separately from other large-use customers depending on their risk profile.

With respect to the tricky question of cost allocation, you know, I think it's an opportunity for more data analytics. Right? The coincident peaks, you know, PJM is still billing on 1 CP. You know, only recently did Dominion convert to a 12 CP rebill and there are formula rate on 12 CP.

You know, other opportunities for additional study for using data, using virtual leaders, trying to create sort of more real-time demand on the system as a way to truly understand, you know, what the impact of any large-use customer and other customer could be. And I think it's an area where we all need to collaborate and, sort of, work together in order to figure our what to do because I'm not sure, if anyone is going to crack that nut yet.

JUDGE HUDSON: Mr. George?

Oh, Mr. Kroboth?

MR. KROBOTH: Thank you, Your Honor.

First, I would say that there are no bad players in this regard. Localities have been actively recruiting data center companies as well as traditional manufacturing for as long as any of us can remember. And they have brought tremendous benefits to the communities where they're -- where they're at.

I can't speak specifically to a manufacturing -- traditional manufacturing. Intuitively, I have to believe that traditional manufacturing works very hard to reduce its electrical demand to lower costs to, you know, increase their margin for the product that they're selling.

Your question about what's different between traditional manufacturing and data centers, I think, is essentially the continuing maturity of technology. And the fact that existing data centers are increasing their demand, a study that I -- that I found came across indicated that a traditional computer rack within a -- within a data center, upon, if it was built in the early 2000s, was anticipated to consume about 5 KW worth of electrical demand.

But based on the new technology, like AI that

we're seeing, that same rack is demanding 50 KW, a ten-fold increase where the building footprint didn't change at all, but the per unit square foot of the building is increasing significantly. And I don't know that -- I can speak as an expert about traditional manufacturing, but I think we work very hard to reduce their demand.

JUDGE BAGOT: Thank you.

Mr. George?

MR. GEORGE: Yeah. So I want to go back briefly to the comments Mr. Robb was making around the significant, sort of, upfront collateral requirements and additional tools to ensure credit worthiness, financial viability of the large load customer. We agree with that.

He's also talked about -- Mr. Gaskill had touched on this concept of minimum demand requirements.

I want to point back to a comment Ms. Robb made about Indiana. I think, and we included in our testimony, we, along with several of the parties, unanimously agreed to a settlement in an I&M, Indiana and Michigan Power, proceeding just last month, this is currently pending before the Commission so we're hoping that gets a good outcome.

But the reason I want to come back to that is

we were able to structure that settlement in a way that added all of these additional provisions to mitigate the risk facing the utility and other customers for a significant investment without adding a separate rate class.

And so if you look at that system, it's a relatively small system, less than a few gigawatts. And so the amount of growth that we were adding was a significant addition to the system, right, multiple gigawatts on top of a small system. And so these are significant incremental investments that we were able to do so without that additional rate class.

I would also note we were able to get the consumer advocate onboard in Indiana. And so just -- there are ways to allocate this risk in a way that protects all customers in the utility from this risk without a separate class.

JUDGE BAGOT: Mr. Robb?

MR. ROBB: Yeah, and just to underscore that coordination, ODEC welcomes that. And we've spent a lot of time -- at least I have -- focused on financial risk coordination. And I think that that coordination, particularly in the market, can focus on things like scheduling load into the day-ahead market. You know, there's extreme price scarcity at times in the real-

time market. You know, the longer that the stand, assuming prices occur, we would expect those markets to -- excuse me -- converge with, you know, participating in the day-ahead market, you know, that's a difference of a price circumstance.

In the event of a extreme weather event where operational coordination is needed, and PJM starts to implement, you know, their manual processes for max generation in load shed, we need operational coordination as it relates to that. You know, I'd like to sit down with data centers and large-use customers and really understand, you know, with the Commissions help and FERC's assistance with NERC as well, you know, how are we going to work together during those operational emergencies?

You know, the representative on the panel for SERC this morning talked about the fact that we had a load drop in the southeast and in other areas, you know, Texas during winter storm Uri. That was a disaster. And in some of our written comments that we were preparing, hoping to pull together some materials and educate us and the Commission on how we, here in Virgina, can avoid that. And what my general sense is, is it's a little slow right now for us to coordinate during those, you know, extreme events.

There was also a reference to that the NERC -- SERC representative made about challenges when large amounts of load drops off the system. I'm not an engineer but the voltage sort of circumstances that can be created then, that causes real system reliability stress. You know, at the end of the day, my primary obligation is to reliability provide power to do so in a formal way that protects consumers.

And I think we, here in the Commonwealth, have a real opportunity to build upon the coordination that Mr. George talked about and Mr. Gaskill talked about, in order to help prepare for the financial and operational circumstances that we could be facing here in Virginia soon, you know. Thank you.

JUDGE BAGOT: Thanks.

Do you have questions?

JUDGE TOWELL: Yeah.

JUDGE BAGOT: Oh, go ahead.

JUDGE TOWELL: Mr. Robb, we talked a little bit about risks, kind of the financial risks and a sort of risk that can come up especially in the short-term. I'm a little -- I'm interested in this question about more long-term, what I guess I would see called overestimation risk. And I'd like to hear from frankly any of the panelists on what they see as the biggest

overestimation risks to the current load forecasts that, of course, can also ultimately impact allocation.

You know, we hear about technological advancements such as potentially, I don't know, something along the lines of quantum computing, Exxon recently stated that they were getting into the stand alone gas generator game. For all I know, we could be buying small modular reactors from Walgreens. So a lot of these can impact what is actually kind of on the grid versus off the grid. And that is potential risk, of course, for what would ultimately be overbuild dynamics.

So I'll just kick that off to the entire panel for anyone who would like to jump on that.

Not surprised, Mr. Wilson.

MR. WILSON: Well, just briefly. I mean all those things. As I described, I think it was a huge uncertainty, but not probably for the first one, two, three, four years. It gets way more uncertain beyond that.

And I will note that of the ten utilities that provided PJM long-term data center load forecast that PJM should potentially add to their forecast, all but one had what I call an S-shape, which means it goes up over the next five or six years because it got

contracts and the -- their customers are talking about this. But they kind of flattened. They kind of flattened after about '30, '31, '32. In nine out of ten cases, that was the shape of their forecast.

Not necessarily because these customers are saying, Oh, we're going to be done in '32. I think it was partly just because they don't have any real firm evidence and all these different uncertainties coming together there.

It was only Dominion that had one that kept going up and that was -- in the meetings, they said that was because they have historical data they could project. But I mean, I would just say that, again, in the near-term pretty firm, but beyond that, all those uncertainties come together. And next year, we'll go through this PJM process again and I suspect some of those will be pushed out and up another year or two, maybe not.

JUDGE TOWELL: Mr. George.

MR. GEORGE: Yeah. So I'm going to agree with a lot of what Mr. Wilson said there, particularly at the end. I mean I think there's only so much a 20-year forward forecast can provide, right? And so there -- they can be directionally helpful, but beyond that, it starts to -- I start to question how valuable they

are.

I do think as we start to inch back towards that sort of 12-, 10-, 8-year mark, we need to start ratcheting up the confidence in that simply because of the long lead times it requires to build new infrastructure.

But I think two thoughts there. We actually think there's a lot of room right now for PJM to be more aggressive in addressing the load forecast adjustments that come up from its TOs. I will clarify that we do think Dominion does a very good job today in sending up requests both based on contract provisions, but also based on historic metered usage. Not every TO has that, right?

And so, it's -- in addition to not having that historic metered data, TOs across the PJM footprint, including other operators here in Virginia, there's no standardization in how they're communicating those load forecast adjustments up to PJM.

And so we do think there's a way for PJM to impose more discipline on the TOs by stating, for example, to the extent your load forecast adjustments are not backed by firm financial commitments or historic metered data and firm analysis, we're going to discount that to some degree. Right? Because there's

got to be a way to rationalize the numbers that are informing the load forecast in what's coming up from the TOs across the footprint.

On the efficiency point, for your question, we operate the most efficient data centers in the world. That's not going to change moving forward. We have a financial incentive to be efficient and we will continue to do that. Between 2015 and 2020, we're able to do five times more from a compute perspective with the same megawatt hour of electricity. We're going to continue to do that. That will have an impact on the long-term forecast.

And so we've got to be constantly iterating between the EDCs, the TOs, PJM, and the large customers to make sure that forecast, while it's never going to be a hundred percent accurate, is as accurate as possible.

JUDGE TOWELL: Mr. Gaskill?

MR. GASKILL: Sure. Yeah, so may I just respond quickly. One thing that Mr. Wilson said on the S-curve versus kind of the more smoother long-term. This is more of Mr. Blackwell's territory from the first panel, but I've heard him talk about it enough. I think I can repeat.

So typically when you see an S-curve where it

goes up very quickly and then flattens out, what you're looking at is a capacity-type forecast. So you'll see a number of data centers -- say, I'm requesting gigawatt capacity whatever, by this year, and you'll see it come up and then flatten out once you hit that gigawatt.

Recall what Mr. Blackwell said when we're doing our forecast, we're forecasting not capacity but meter demand. And so we may see that 1000 megawatts of capacity request, but we're going to slowly -- we're going to build that ramp period into it over time. So that's why you don't see that flattening because we're pushing it out over time as we see those coming in.

And as he said, we've got signed contracts with financial commitments behind it to take us out to the metered demand through 2040. So we don't believe -- we've been at it a lot longer and other TOs and PJM. We do feel like we have a robust, very accurate forecast.

So backed up by -- backed up by signed contracts by customers, so but -- and I would also just say when you start seeing data center companies -- you see Amazon, you see Google starting to invest in things like SMRs themselves that are technologies that are by and large going to not be available commercially until

we get say to mid-'30s, right?

But they're putting significant -- or be showing a willingness to put up significant financial commitments for those types of things, that tells me they view it as real, as well, and that this load growth is going to continue on for the foreseeable future.

So I think you're seeing it in the contracts they're signing. You're seeing it in the statistics we're seeing. But you're also seeing it through the financial commitments they're making otherwise, that it's real.

JUDGE TOWELL: Thanks.

JUDGE BAGOT: Thanks.

We have a little bit more time left. I wanted to circle back to market-based rates. I'm hoping you all can help me understand this a little bit better in the context of data centers.

So it seems like -- and there may be a little bit of a difference between the market-based rates being discussed by Mr. Robb and market-based rates that Dominion uses or currently has on file for its limited number of data center customers. And, to me, the primary difference I see is that as described by Mr. Robb, it truly is the utilities or the co-op going to

the market purchasing power and passing through that cost to the end use customer.

As described, I think, by you, Mr. Gaskill -- but please correct me if I'm wrong -- the market-based rate is really just a proxy for power cost or energy cost at that time. And it's not really the cost of you having gone to the market and procured that power for that customer and then passing it through.

And so one of the things that you've mentioned -- and, again, this is me just trying to understand, so please clarify if it were necessary.

One of the things I'm struggling with market-based rates in that context is to the extent that Dominion is building its own generation to sort of protect itself for potentially price volatility in the wholesale markets, but then is using those prices as a proxy for power sales, isn't there an opportunity for data centers to either overpay or underpay their contribution to these system -- their true cost of service to the extent that for the most part, the majority of Dominion's system is being served by Dominion-built-and-owned resources?

And so if that risk exists, what degree of risk is there? Is it enough that it would cause us to have concern about the fairness of cost allocation

under market-based rates with respect to data center customers?

And what could we look at to get a better sense of, sort of, what that over-under risk could be with respect to those types of customers?

MR. GASKILL: Sure, a lot to unpack there. So I think the short answer is customers that are on a market based rate, yes, there is risk that they will be paying either -- or I mean they will be, they will be paying either more or less than our standard tariff depending on market prices. And that'll change over time. If you look at our MBR tariff, if you went back to say the 2019, 2020 time period, they would have been paying less than our standard tariff because then our prices were very low and capacity were very low.

If you look at 2022, power prices with gas prices, they were very high. They would have been paying much more than our GS-3 or GS-4 sticker tariff rate, so, yes, that exists.

Our -- so where I view it as advantageous, not just -- I mean to the data center customers that are on the MBR and industrials that are on MBR, they have various reasons for doing that. But where it can be advantageous to the rest of our customers is that it does provide, I believe, a near perfect hedge against

our purchase power expense.

And so if you look at, say, the last two, three years. I'm going use sort of round numbers. But we purchase on an energy basis roughly, call it 20 percent we're purchasing from PJM, meaning we're -- our load obligation is higher than what we're actually self-generating. So we're purchasing -- and then that's true almost every hour of the year. We're almost always purchaser. But across the year, we call it 20 percent.

We had, as of a year ago, roughly 15 percent of our sales were on a market-based rate. So when you think about our purchase power, what is it being priced as? It's being priced at whatever the PJ market price is which it goes up or down with LMPs. Well, that 15 percent of our sales are also paying based on that same market price. Kind of a little bit of a shape difference, but it's paying the same DOM zone energy price. And so you have almost this perfect correlation between our purchase power expense and what they're paying.

And so that -- it reduces the volatility for all customers in terms of what we'll pay for in our fuel factor because they're -- when prices go up, they're paying more. Prices go down, they're paying

less, but everybody benefits from the lower power prices as well, so it's a perfect hedge.

And you asked, where could you look to? I would actually look, there's a -- my testimony in the 2022 -- 2023 fuel case where we talked about this hedge effect and what that would look like, so that might be a place -- maybe a starter.

JUDGE BAGOT: Sure. Does it change based on, say for example, in the next ten years -- well, there's a couple of different things that could change. If 75 percent of energy sales are now coming from data center customers, does that change the benefit of the hedge?

And I would also say if Dominion is making investments now in terms of building generation to meet projected data center load, whereas overtime on a market-based rate tariff, in ten years if the wholesale market sort of levelizes and prices go down, but the Dominion made the generation investments now, does that risk --

MR. GASKILL: Yeah.

JUDGE BAGOT: -- on the long-term sort of sub --

MR. GASKILL: Sure.

JUDGE BAGOT: I don't want to use subsidization. That's a --

MR. GASKILL: Yeah.

JUDGE BAGOT: -- kind of sensitive other word. But is there -- is there some sort of inequality in terms of the cost recovery that's happening there?

MR. GASKILL: In a -- in a perfect world we would want the volume of sales that are on our MVR or SCR to match our purchase power volume in a perfect world. And then you're perfect -- nearly perfectly hedged.

I think what you're getting at is in a scenario where we continue to build generation, and perhaps we're not net purchasers, is there a mismatch there? And I think that's a valid concern over the long-term.

I would say for the foreseeable future, we will continue to be net purchaser of both energy and capacity. So I don't see that being a large concern, at least in the short medium-term but it's certainly something over a 10-, 15-year period could that energy mix change? I think that's a valid concern.

JUDGE BAGOT: Thank you.

Any other questions?

All right. We've got a couple minutes left, so I'll offer the same thing I offered the last panel, which is like a lightning round of final thoughts,

takeaways that you all may have. So I'll start -- I'm going to start over here this time.

Mr. Kroboth, you can go ahead.

MR. KROBOTH: Thank you, Your Honor. I would just offer two comments. One is to thank the Commission for your time and leadership in this role. We're looking forward to seeing how it comes out. Also, thanks to my colleagues on the panel, for this panel as well as the panel before, tremendous information I know they provided. And I look forward to the information from Panel Number 3. So thank you very much.

JUDGE BAGOT: Ms. Robb.

MS. ROBB: Yeah, I would just go back to my comment of first do no harm, so I do think that rate design should be considered. Rate design changes should be considered. But when you do that, be careful that you're not fixing one problem and causing another. Particularity, of course, in my case from the industrial perspective.

MR. ROBB: I'd hope Virginia takes this opportunity and this platform to really be a louder voice at PJM and in our national conversation, helping ensure that PJM addresses resource adequacy in way that balances allocation and cost to consumers. And

thinking bigger about how, you know, we can really work together on that.

And aligning, for example, the natural gas day with the energy market day would go so far to helping make sure that when ODEC's plants need natural gas in order to run during the extreme weather events, we actually have the natural gas that we need. So, you know, we've got a lot of smart people in this room, lots of smart people in the Commission and in the legislature, Executive Branch, and I hope you can really amplify our voice because I think we can make a big impact.

JUDGE BAGOT: Thank you.

Mr. Wilson?

MR. WILSON: Thank you again for inviting me and thank you for your really good questions. And In hope you'll continue to drill down on this important question and on this new load and to try to really fully understand it and understand how firm it is. Thank you.

MR. GEORGE: I would echo my appreciation. I'm going to see you all in about two minutes. And, no, it's -- clearly there's a lot to do here. I want to echo Mr. Robb's comments. This is an opportunity.

We have heard a lot of discussion today, more

than I think that I expected about the wholesale market and the impact that that is having on what's happening here in Virginia. There is a tremendous amount of opportunity to engage both at PJM as day regulators and through the organizations that you are members of. I would encourage you to really lean into that. I think your leadership there could be extremely beneficial, so, thank you.

JUDGE BAGOT: Thank you.

MR. GASKILL: I'll echo what everyone's said, thank you for the opportunity. I think this is a great forum to be able to discuss a number of complex issues. And I have to say, I mean, I've learned just listening and I'm looking forward to the third panel as well.

You know, again, Dominion stands where we continue to review these cost allocation issues. We understand we have an obligation to serve. We have -- as customers connect, you know, reliably, affordably, and of course, for the Clean Economy Act, pursuing clean. So we're gearing up to av very difficult challenge but we've -- we will continue to do that.

And then, you know, sort of cost allocation, I do just -- you know, we've talked a lot about the risk and the stranded cost risk that to me, that is probably the biggest concern going forward, is the

amount of infrastructure development in ensuring that as we build 30, 40, 50-year old assets, that the customer or work is going to be there. Or just, you know, the customers we're building it for will be there to pay for it. That, to me, is as important as the -- as the true allocation issue. So looking forward to addressing everyone forward. Thank you.

JUDGE BAGOT: Great. Well, thank you all. I really appreciate your participation today. Great panel. We're going to break now for 30 minutes, so hopefully everyone can get a quick drink and a bathroom break, and we'll be back at three o'clock. Thank you.

(Whereupon, a recess was taken at 2:30:45 p.m.)

JUDGE BAGOT: All right. Welcome back. Thank you, panelists, for already being up here and ready to go. I appreciate it. I'm impressed looking at the crowd. We haven't lost too many folks for late in the day.

So with that, I will start with the panelists and ask for brief introductions and introductory remarks.

And I will start on my left with Mr. Vaughan.

MR. VAUGHAN: Good afternoon. On behalf of Appalachian Power Company, I'd like to thank the

Commission for organizing this technical conference for the opportunity to participate in the discussion regarding this important topic.

As managing director of regulated pricing, I support the AEP utility operating companies in the areas of cost of service, cost allocation, rate design, special retail contract negotiations. That's what my team is in charge of.

AEP has experienced firsthand the rapid growth of large loads in our service territory, and we recognize the importance of enabling this development. AEP is committed to providing reliable service, supporting economic growth, and working with all customers to determine how to best meet their energy needs.

The manner in which we integrate this large load growth opportunity into our system, including under what terms of service, could have cost of service and rate implications for the company and its customers for decades to come.

This is a timely discussion for APCo as it entertains prospective load additions that could more than double its current Virginia jurisdictional peak demand, many of which are a size that could be considered a large load with the potential to make a

material impact on the overall makeup of the company's load and will require incremental utility and infrastructure, likely both generation and transmission to serve these loads.

From the company's perspective, it is reasonable and important for the Commission to adopt policies and safeguards that accommodate this potential load growth in a thoughtful and deliberate manner. It remains the company's hope that when it contracts with new, large loads, they will develop, interconnect, and take electric service as indicated by the prospective new large load customers.

Nevertheless, it is necessary to establish terms and conditions for service, safeguard against the cost impacts to other customers that can occur if the new load does not materialize on schedule, fully materialize, or terminates prematurely. The company and its affiliates believe that enhanced terms and conditions such as the following are reasonable, prudent, and needed enhancements to the company's standard electric service for large load customers and appropriately balance the risks presented:

An extension of the standard contract term. Currently, it's two years on our industrial tariff. We think something closer to 20 years is more appropriate

in this area; enhanced term of trailing minimum demand charges. So this is, you have a contract and you cease operations before your contract is over. Right now, it's roughly 11 months. We think something closer to five years is more appropriate;

Provisions that allow a new customer some degree of flexibility to reduce its contract capacity during the contract term; an increase in the current -- for us, a 60 percent minimum billing demand -- but an end increase in the minimum demand charges in general;

And then an increased collateral obligation to back the enhanced trailing minimum demand charges should be considered if a customer were to maturely reduce or cease its operations. So right now, we really have no collateral requirements. We just have the deposit policies and tariff.

It is important to note, this type of framework is meant to provide the customer with some degree of flexibility in its operations while protecting existing customers and providing the company with the financial assurances needed to prudently invest in expanding its system to serve the new, large loads.

Under this type of framework, the new, large load customer will not pay any rate charges that they

would not have under the existing tariff unless they do not fulfill their contractual obligations with the company.

Just to note that the AEP affiliate item that's been mentioned multiple times here, if you have questions on that, it's in my statement here as well, but I was part of the team that --

JUDGE BAGOT: Okay.

MR. VAUGHAN: -- negotiated that, so I can answer your questions. And with that, I'd just like to thank you for the opportunity and appreciate the discussion today.

JUDGE BAGOT: Thank you.

Mr. George, back to you.

MR. GEORGE: Good afternoon, again. It is a pleasure to be here, so thank you for the invitation to speak on this panel as well. I'll be brief in my remarks and just maybe throw out a couple things for consideration. I think the theme of this panel is a little bit more around the other tools in the toolkit. Right? How can we think about ways to address the problem, perhaps outside the box, that we currently have thought of.

And so just a couple things. One area that's getting a lot of attention is this issue of

co-location. I think some panelists have mentioned earlier there was a tech conference at FERC in November that I was also a part of. And I just, you know, at least for our perspective on co-location, we see real opportunity there.

In particular, the ability to match new loads coming onto the system with new generation. It's important to emphasize that new point, particularly given the resource adequacy discussions that we have heard. I think it's no secret PJM is expecting serious resource adequacy issues by the end of this decade, and so there is a need for every bit of generation capacity that can be brought to the system. And so that's where we do see a ton of value in co-location.

Last week, Google announced a partnership with Intersect Power and TPG that reflects this model moving forward, whereby we will build new data centers in co-development with new generation resources going forward. So I would just encourage us to think about how co-location in that regard can be a tool.

I will say the other version of co-location, which has created a lot of attention at FERC, which takes existing generation resources to match with new load, that is not a pathway we are interested in pursuing, just given the resource adequacy challenges

the grid is facing.

And more importantly, with respect to co-location, we are not trying to avoid any generation or transmission costs associated with connecting to the grid. As I noted in comments to FERC last week, co-location is really about speed to market. But we want to do so in a way that's in partnership with our utilities and our grid planners. And so I would encourage this commission to think about how that could be a tool moving forward.

Separately, I would also like to really encourage us to think about what types of innovative rate structures exist to enable us to grow in a way that also enables us to procure the types of resources to match our sustainability objectives. I will note there is -- there are opportunities and potentially new opportunities here in Virginia to do that.

But I would also point to an investment that we made in Nevada, earlier this year, partnering with an enhanced geothermal developer to bring that 24/7 firm base load clean resource onto the grid in a way that benefits us, but also benefits other ratepayers of the utility at no additional cost to that utility.

So I would really encourage us to think through what are ways that we can think through these

innovative rate structures in a way that starts to solve these broader problems.

Next, and I hit on this a little bit in my opening testimony, but I do think it's really important we think about how we can make broader investments in things like energy efficiency and support low-income communities as we're growing.

The settlement that was mentioned in Indiana, if approved, would create a carve-out whereby we would be supporting low-income residents in Indiana for things like pre-weatherization and investments in energy efficiency that can reduce overall energy burden. There's a ton of potential to do that, and we are looking actively at ways to do that here in the commonwealth.

And then, finally, I hit on this a little bit in my last comment. I've heard a lot of discussion about PJM. It's clear what happens in Valley Forge has dramatic impact on what ratepayers here in the commonwealth are exposed to, and I really think that moving forward, there is a more aggressive role for state utility regulators to play there.

I often refer to state regulators as super stakeholders at PJM. Even though you don't have a vote in the process, your voice carries a ton of weight.

And so we just encourage you to think through ways to engage in things like market design proceedings, such that we are getting these things right.

And so I'll stop there, but I really just look forward to opportunities to elaborate on what I've outlined. And thank you again for the opportunity to be here again today.

JUDGE BAGOT: Thank you.

You're going to have to help me pronounce your last name. My apologies. Is it Jaramillo?

MR. JARAMILLO: Close enough. We'll go with that.

JUDGE BAGOT: No, no, no.

MR. JARAMILLO: No --

JUDGE BAGOT: Please -- please correct me. Please correct me.

MR. JARAMILLO: Well, my name is Gilbert Jaramillo.

JUDGE BAGOT: Okay.

MR. JARAMILLO: All right.

JUDGE BAGOT: I will --

MR. JARAMILLO: Well, good afternoon.

JUDGE BAGOT: Thank you.

MR. JARAMILLO: Again, my name is Gilbert Jaramillo. I am the vice president of power supply for

Northern Virginia Electric Cooperative, NOVEC, for which I am responsible for NOVEC's overall power supply portfolio.

I've been with NOVEC for over 36 years and have held various leadership positions within the cooperative in the areas of rates, cost of service, regulatory large load infrastructure agreements, retail power supply agreements, and NOVEC's for-profit affiliates in the natural gas and fiber business.

Let me start by offering my thanks to the Commission for hosting this very important technical conference and allowing the views of NOVEC to be heard today.

So a little background information about NOVEC and its history with the data center industry. I'm going to attempt to paraphrase my written comments.

So NOVEC's peak load in 2024 reached 2,072 megawatts, more than double the 927 megawatts in 2012. This doubling of our system peak was due to data centers.

NOVEC serves 58 data center buildings with a combined load of 1408 megawatts. By 2035, NOVEC expects to serve over 120 data centers, including campuses and buildings, with a forecasted peak load exceeding 10,500 megawatts. And I'd like to emphasize

that this is not contracted capacity, but this is the forecasted peak.

Data centers currently account for over 65 percent of NOVEC's energy sales, with projections showing that figure may rise to 95 percent by 2032. So NOVEC's approach to serving data centers: NOVEC serves data centers under three commission-approved tariffs that correspond to various load levels. These arrangements include contribution aid of construction requirements, minimum bills for delivery service, weekly power supply billing, and strict credit review and collateral requirements, I emphasize.

These tariffs allow for market-based options that contemplate additional bilateral arrangements with large data center customers that match the risk to NOVEC's general body of ratepayers.

NOVEC has been very successful at putting credit instruments in place that offer a variety of solutions available to different types of data center customers. This is done through the normal NOVEC business model.

Concerns and challenges. While NOVEC seeks no changes in law or commission rules to complement its service to large load customers currently, NOVEC is, nevertheless, concerned about the following issues:

Transmission costs. Data center expansion is driving up bulk transmission costs, placing a financial burden on all ratepayers. NOVEC advocate for revisiting cost allocation to ensure transmission costs are fairly distributed.

Energy market concerns. The shift to nondispatchable generation and increasing energy costs, such as the rise in capacity-clearing prices, may negatively impact all customers.

Backup generation utilization. Data centers have backup generation that is rarely used. NOVEC suggests exploring opportunities for more efficient use of this idle generation, especially during times of high-priced LOPs in the market.

Co-location generation and load. NOVEC expresses caution about co-locating generation with load, as they may increase costs for non-data center customers. If data centers offer self-supply, NOVEC believes it should be a temporary solution rather than a permanent one.

In conclusion, NOVEC remains committed to serving its diverse customer base, including data centers, and advocates for innovative solutions to manage the growing demands while addressing the associated challenges. Thank you.

JUDGE BAGOT: Thank you.

Mr. Smith?

MR. SMITH: First, I would like to thank the Commission for giving me the opportunity to represent Tract today. I appreciate you putting this conference together.

Before I jump into these comments, there is one thing I wanted to say. I just heard my counterpart, Gil, say right here, in terms of bulk costs and it not being allocated across the ratepayers, we've heard today from Dominion, as well as from the JLARC readout, that the data center customers are paying their fair share based on the rates that are created. And with that, I would like to dive in.

So my name is Brandon Smith, and I serve as vice president of utility development at Tract Capital Management, a land acquisition and development company that, through its managed affiliates, master plans, data center, parks to meet the growing demand for digital infrastructure.

Our portfolio encompasses multiple gigawatts of planned development over the next 15 to 20 years, reflecting the immense scale of the challenge and opportunity before us. Specific to the State of Virginia, Tract, through its subsidiaries, is

developing a 2.4-gigawatt data center campus in Hanover County, Virginia.

I've earned over 13 years of experience in the energy sector. My career began at Dominion Energy, where I spent more than four years directly developing strategic partnerships with major data center operators and advancing Virginia's rise as a global hub for digital infrastructure.

Later, at Amazon Web Services, I managed data center interconnection and energy strategies across the eastern United States and Canada.

Between Dominion Energy, AWS, and Tract, I've secured over ten gigawatts of power commitments from master-planned campuses in markets like PJM and MISO.

From Tract's perspective, the core challenge presented is not a lack of willingness to invest, but rather one of pace, proactive planning with transparency, and collaborative alignment. It is our experience that companies like Tract pay the fair share of costs necessary to support infrastructure development. However, utilities are struggling to build infrastructure quickly enough to meet rapidly growing demand. This bottleneck jeopardizes local economic growth, as well as the country's global leadership in technology and innovation.

As energy-intensive industries continue to expand, the stakes grow higher. Misaligned infrastructure expansion risks, stranded investments, or unfair cost burdens on all classes of ratepayers. It is important to note that addressing this challenge does not require abandoning rate-basing principles or established structures that have proven effective.

However, discriminatory practices that unfairly target specific industries must be avoided. Adding to this complexity, past performance is no longer a reliable indicator of future demand. The unprecedented growth seen throughout the United States highlights the need for a paradigm shift in planning and execution.

RTOs, utility commissions, policy makers, and large load users must work together more closely than ever to ensure infrastructure is available when and where it is needed without sacrificing fairness or efficiency.

Addressing these challenges requires urgency, innovation, and a commitment to proactive planning. The urgency of this moment cannot be overstated. Without greater collaboration between key stakeholders, we risk falling behind in the race to deliver reliable, affordable, and timely infrastructure.

By embracing best practices and fostering partnerships, we can accelerate development, minimize risks, and ensure that infrastructure expansion keeps pace with demand. This is not just an economic imperative, but a critical step toward maintaining our country's competitive edge in the global innovation landscape. Thank you.

JUDGE BAGOT: Thank you.

And, Mr. Crenshaw?

MR. CRENSHAW: Good afternoon. Thank you. First, thank you for convening this technical conference and allowing AES to be a part of it.

As an independent power producer, AES is committed to the commonwealth's renewable energy goals, delivering innovative energy solutions for our customers, and maintaining cost efficiency for all ratepayers.

My name is Walter Crenshaw. I'm the senior director of origination at AES. I cover commercial contracting of our renewable assets along the East Coast, which includes Virginia.

AES, itself, is a global energy company headquartered in Arlington. Since 1981, we are a nationwide leader in renewable energy power purchase agreements for corporate customers, with a portfolio

that represents over 580 clean energy projects across 28 states.

We own and operate AES Spotsylvania, which is a 485-megawatt solar facility in Spotsylvania County. It's the largest solar facility east of the Rocky Mountains.

We have approximately one gigawatt of renewable energy generation operating in the commonwealth, and about a half-a-gigawatt under late-stage development or in construction.

As an independent power producer, AES is committed to supporting the commonwealth's renewable energy goals, delivering innovative energy solutions for customers, and maintaining cost efficiency.

We addressed a few key opportunities and challenges related. Hopefully, these aren't too duplicative from the rest of the day. But as has been discussed today, load growth, particularly driven by data center expansion, is increasing demand on the grid.

For IPPs like AES, this represents a unique opportunity to continue to help customers mitigate risks associated with load growth, support infrastructure demands, and align with the commonwealth's renewable portfolio standard goals.

By developing and building in-state renewable energy projects, IPPs help manage energy costs and provide clean and reliable energy.

A few insights we had from the JLARC's December 9th report that we would want to point out: one, the cost of importing energy.

So in the JLARC report, it was concluded that importing energy from out-of-state resources would drive up costs. IPPs, like AES, play a crucial role in mitigating that by building renewable energy facilities within Virginia. This increases supply, supports local economic growth, and ensures affordable energy for our customers and all ratepayers.

Additionally, the point about energy storage in capacity markets. So with the accelerated renewable buyers only being able to purchase energy, not storage in capacity markets, the suggestion was made of perhaps allowing enhancements to how storage capacity is credited.

Such a change could enhance grid reliability and encourage broader adoption of energy storage solutions and perhaps get to some of the intermittency concerns that were expressed earlier today.

So AES supports this recommendation and is prepared to work with the Commission and our customers

to meet this market demand.

Additionally, JLARC highlighted that we may need 16 gigawatts of solar in the half-of-unconstrained scenario. However, one thing that we see is inconsistency between local permitting processes significantly impeding the deployment of solar energy projects.

Our challenge is not finding customers who need energy, but finding localities willing to approve the development of solar facilities. The solar ordinance inconsistency between localities and unpredictability in solar siting within localities is crippling the deployment of renewable energy infrastructure, hindering the commonwealth's ability to meet its energy and climate goals and keep rates affordable.

To address these issues, AES supports establishing clearer guardrails for localities on how to regulate ground-mount solar.

Further, co-location of renewable energy projects with other infrastructures such as data centers offers a promising strategy to mitigate this risk. By strategically locating solar facilities near load centers or data centers, we can minimize transmission costs, reduce infrastructure delays, and

improve grid reliability.

Co-location would balance increased demand from data centers while supporting Virginia's clean energy objectives.

However, co-location also requires siting and permitting clarity. So Virginia's energy future depends on a coordinated effort to address load growth, streamline local permitting, and implement policies that support renewable energy development.

AES will continue to partner with regulators, localities, and consumers to develop in-state renewable projects, advocate for standardized local permitting processes, and support policies that promote cost-effective, reliable, and clean energy.

Thank you for your leadership and for the opportunity to contribute to these important discussions.

JUDGE BAGOT: Thank you.

Thank you all for your introductory remarks.

With that, I'm going to pass it off to you, Judge Towell, to get us started.

JUDGE TOWELL: Thank you, Judge Bagot.

Over the course of the day, and in a number of the opening comments that have been provided in advance of this afternoon's discussion, there have been

a number of possible tariff provisions that have been mentioned.

I'd be interested in hearing from the panelists, which one or two do you believe are, kind of, most critical or fundamental for just, kind of, a successful way of handling some of these dynamics associated with large load customers, and as large load customers, which tariff provisions you feel are, kind of, best aligned with how you operate your business.

And conversely, which types of tariff provisions that have been mentioned would present real challenges either to some of the utilities or co-ops, and to some of the customers that we've got here on the panel.

I'll let anyone take to the first bite.

Mr. Jaramillo?

MR. JARAMILLO: All right. So in regards to tariffs, I believe we've heard a lot of past panelists talk about mandatory MBRs for large customers. I think that's a position that NOVEC would support.

I would not call it a data center tariff. I would call it, you know, a load characteristic. You know, certain load factors are megawatts, and have them be at the market and also make sure that the utilities are contracting for any investment, and they're going

to get that back in a reasonable, you know, period of time, if not immediately.

JUDGE TOWELL: And would there be any sort of provision that you see as particularly more challenging from the co-ops standpoint that's been mentioned or discussed either here or in the pre-published comments?

MR. JARAMILLO: Well, I'll separate those two issues. So there's the infrastructure agreement, and then there's the power supply side.

The power supply side being the more challenging side as they talk about the, you know, hundreds of millions of dollars that these bills can accumulate to in -- during an extreme event.

So you would have to address that through very strict credit and collateral requirements, and depending on who the counterparty, the customer is, if you're dealing with an investor-grade data center, you know, that comfort level is pretty much there if you're dealing with a parent company.

But you -- also, someone suggested if they put up a single-purpose LLC, that should raise some red flags, and you need to make sure that you put in the correct credit and collateral requirements when dealing with such an entity. So that is a challenge on the power supply side.

JUDGE TOWELL: Thank you.

Mr. Vaughan?

MR. VAUGHAN: So when I think about tariff provisions, there's three of them that are really closely interconnected. Those would be the term of the agreement, the financial obligations that the customer is undertaking in that agreement, so probably your minimum billing or your exit-fee-type calculation, and then how are you collateralizing those obligations?

So, like, those three together form the backbone of existing customer protections and having the adequate -- I've heard the term skin in the game mentioned today, from the prospective customer's point of view, and it's giving the utility the assurances it needs to go before its regulatory body and say, hey -- I need to go, here's a CPCM application for this infrastructure, and here's what's backing that up to ensure you that it is real.

We've heard load forecasting mentioned quite a bit today. The way AEP is including these new, large loads in its forecasts that we have a signed agreement out through, I think, the end of this decade for any large load additions that are going into our load forecast in our PJM region.

From a tariff provisions that I wouldn't care

to see, in my mind, we've also talked about whether potential rate classes could be discriminatory to a certain industry.

I'm a long-time rate nerd, and these -- the data centers, to me, look exactly the same on paper as a gas processor or a high-load factor primary metal customer. It's a big, flat block of load. And so if you didn't say data center on it, I wouldn't know it's a data center.

So I don't -- the way we've been proposing things in our vertically integrated states, is that it should just be with the rest of our established industrial class, and you're going to have cost allocation swappables that you always do, and inter-class, and then you're going to have intraclass issues on the rate design. But there's always going to be push and pull between high-load factor and lower-load factor customers within a population, so.

JUDGE TOWELL: Mr. George?

MR. GEORGE: Yeah, I would agree with a lot of what Mr. Vaughan said.

I think the term piece is key, as was mentioned in your opening testimony, and also in mine, I believe.

In INM, we got to 80 percent over 12 years

for the minimum demand charge as part of that term, in addition to significant upfront collateral requirements.

I think those are all terms that we can generally live with, provided that they make sense for the system that we're looking at. I don't want to repeat myself, but again, as I noted in the last panel, I think any creation of a new specific customer class, based on that type of specific customer, would be problematic.

And so, again, would like to see how those additional provision term financial obligation collateral --

I like the way you framed it up.

Can start to address the utility risk, and frankly -- and -- I think the utilities are in the best position to do this.

Like, we need to know what types of collateral you need to see, right? What is it going to take to make you comfortable with the financial risk that you're taking on? And then we can come to the table. But I would -- I would bucket those three as things that are generally a better starting point. Thank you.

JUDGE TOWELL: So, Mr. Smith.

MR. SMITH: So I'd say that Tract is aligned with the MBR, market-based rate, and especially as Mr. Gaskill from Dominion explained, it's used to protect ratepayers. In terms of the energy itself and how you will find different entities that use LLCs or parent companies, really the focus should be the collateral.

If there is a company that has the collateral that can be put up to protect the ratepayer, then that should be more than acceptable. So it's just ultimately determining what level of collateral that particular customer has to put up and what level or what type of collateral the utility accepts.

But, ultimately, again, in terms of the tariffs, MBR works very well, and the collateral is not only going to be the key to just energy discussion, but also the infrastructure part of the discussion as well.

JUDGE BAGOT: So to -- follow-up question on that, talking about, sort of, tariff provisions that can help mitigate a forecasting risk, mitigate stranded asset risk, you're talking about, you know, opportunities to be more stringent with respect to collateral, collateral requirements.

Looking at minimum bill provisions, exit fees, collateral, based on today's discussion, it sounds like -- and the AEP settlement I think comes

into play a little bit -- based on the discussions today and what I'm familiar with, it seems like most of these are around energy costs, your energy bill, and then there's minimums around, you know, different percentages based on that.

Is there a need to pull in other infrastructure costs into that, both from a forecasting risk mitigate, but also a stranded asset risk mitigate?

And when you're looking at significant costs like transmission, which we've talked about earlier, is very difficult to parcel out, what would that look like? How would we start to look at, you know, protections and tariff provisions that would look at transmission investment risk?

Sure, Mr. Vaughan, kick us off.

MR. VAUGHAN: Certainly. So I can tell you how the AEP companies look at it. And we -- from a tariff provision, you're right, it's centered a lot around generation capacity, right? If the energy goes away for whatever reason, right, we're either not incurring a purchase or we're -- maybe we're not dispatching something, like, that's all left up to the wholesale market.

So you can think of that as variable in nature, but the generation capacity piece is not.

They're from a -- there's a transmission component to that minimum charge as well.

But when you think about the actual transmission infrastructure, the way we deal with it is, so you have a large load coming to us, I need you to build me 300 megawatts here, and I want it on this timeline, and so we will typically sign a letter agreement for that transmission infrastructure, the studies that have been mentioned, the long lead time infrastructure we have to purchase so that we can be on the customer's timeline, and that agreement is separately collateralized.

So if we were to build that line and the customer not show up, they have purchased a very expensive extension cord at that point, and then you have the discussion around regional transmission expansion, right? And the not-so-bright line between federal and state rate making there, right?

I think you're going to see cases at FERC on how we deal with this, and I know -- I believe there was an Exelon filing that was made around this. It was deficient, but they're going to re-file, is my understanding.

So I think it's going to come up in the federal discussion, and then it's going to be on the

transmission owners to follow up with that. But, you know, that's a very hard.

As was mentioned in the last panel, I said, well, this portion of the outside-of-the-zone project that was built because of your load expansion is on you, so it's always going to be a question of cost allocation. And, you know, right here, as we sit here, we can -- we can handle the retail piece, you know, and make sure we have adequate protections there to insulate our customers.

JUDGE BAGOT: Do you think having a minimum energy bill or exit fee around those costs is sufficient to address, I'll say, forecasting risks in terms of the skin in the game, you know, wanting to make sure that forecasts are accurate and that load is going to show up, but then also from a stranded asset risk?

Do you think that paradigm that we have, taking out the transmission investment piece, is that sufficient, or do we need to look at bolstering that?

MR. VAUGHAN: We need to bolster from what we have today. What we have today in our tariff is not sufficient to cover -- to cover stranded cost risk from expanded system. Because, I think it was also said in the last panel, like, if you think about how we're

situated today, every load addition is an expansion in capacity, whether it's G&T or just G, there's going to be initial infrastructure, whether the utility builds it or some of the market's going to have to build it. You know, I won't go into that.

But there's going to be additional infrastructure, and so we need to look at these terms that have been in place for decades in a system that's been largely highly generation capacity sufficient for four decades. Right? I mean, there's been general length, and -- at least in our system, since the '80s, and that's not the case anymore. And that's when these tariff provisions were put in place.

JUDGE HUDSON: So to continue the conversation about tariffs, Mr. Robb, in the previous panel, talked a lot about the importance of studies, and we needed a lot of studies, whether they're transmission studies or feasibility studies.

And so I guess my question for the panel is should tariffs include provisions that are require the data centers to fund feasibility studies, infrastructure upgrades, or even contingency reserves to protect the grid?

Don't all answer at once. Mr. Smith?

MR. SMITH: I'll give it my best shot. In

terms of the studies, I would say Tract and the industry from our perspective is more than willing to fund the studies. The studies mean two things. I'll put my utility hat on.

In terms of the studies, what it means to the utility is their ability to deliver for the customer. What is the infrastructure investment that we have to make in order to be able to meet this particular customer's load ramp? It means something a little different for the customer. That study to the customer determines if they're going to do business with that particular utility, or do business with that particular cooperative, or do business in that particular state.

So that's the question that the customer, the lowest load user, has to ask: does the information from this study give me the certainty that I need to continue the development to be able to make multi-billion dollar decisions and determine if I want to be here?

We're talking about investments that are 15 and 20 years in length. So a large-load user, a large-load developer, they need to see a path and runway to ensure that their multi-billion dollar investment can actually thrive.

So what happens if a utility underdelivers,

that becomes problematic as well. It's not a situation where, oh, they underforecast it, so I'll just wait for the next load to show up.

But underforecasting creates strain of assets for the developer. So you can be in a position where you're planning this multibillion dollar campus, but the utility is not able to deliver anywhere with what you need. Thus, you've gone through this process to get your land zoned and titled, you've talked about taxes, what can be collected, timelines that they can expect it, and these things don't get met.

So to put -- to put a button on this, yes, pay for the studies. In terms of the upgrades, it gets a little more complex.

So we heard today that a customer may ask for a gigawatt of infrastructure. But the utility will build towards what's the meter load. So that presents also a challenge for a customer.

So if you're at a point where you're a customer and you're paying for upgrades, you want to pay for those upgrades in advance. You want to pay for those upgrades before those upgrades are needed so that you can continue to grow at scale. Having to wait four years or five years for upgrades to occur, such that you can now make good on that development that you got

zoned and thus be able to deploy that capital in time to meet all the promises that you made, that -- there has to be an alignment there.

So, again, if upgrades are being paid for, it's the customer or the developer, or the large load user, that's paying for the ability to have access to the capacity that's needed for them to grow at the scale that they believe they can grow and not just in utility.

JUDGE HUDSON: Thank you.

So, Mr. George, let's go back to co-location. And my question is really simple. It's, how feasible is the co-location of electric generation facilities and their data centers to alleviate the strain on the system?

MR. GEORGE: Yeah, thank you for the question. I -- so it all depends on location. It depends on the structure of the state where we're building a facility.

And so I think, you know, there are certain places where it could make sense, right? And what I'm thinking about is more like, are there places where you can reduce interconnection costs for an interconnecting load and an interconnecting generator based on co-locating near the same transmission delivery point.

Right?

And I think that's where the real opportunity is, is how do we lower those interconnection costs for both sides of customers? And so I think right now we are currently looking at places all across the U.S. to do this. I think Virginia is somewhat unique, just given its regulatory structure.

That said, in the vein of partnership, right, to the extent there are opportunities to partner with our utility and third-party developers, it's something we're happy to consider. But it does depend very significantly on, sort of, the regulatory structure and just availability of transmission in a certain spot.

JUDGE HUDSON: Thank you.

Mr. Vaughan?

MR. VAUGHAN: Yeah, we've mentioned today -- it's been mentioned a couple of times -- about them having the five-nines of reliability for your regular cloud computing data center and having one-to-one diesel backup on site. Right?

So you have co-located generation, but it is permitted in a way that it can't be used unless there's a system emergency. Right?

And so there's opportunities there that if you're -- if you're looking to co-locate, and maybe

break down some of that incremental costs, can you, maybe, put in aeroderivative gas CTs or some other storage, some -- if it were to be economic for the customer, but some other backup that can carry load that can also be counted as capacity. Right?

That's the issue. It sounds simple when you say it, but then let's say you do switch from emergency permitted diesel backup to an aeroderivative CT. Now they have the same permitting timeline as the utility does with air permits and queue issues and all of that.

So there's opportunities and synergies there, but it's not a panacea. Right? I mean, you're going to run into some of the same lead times. And I'm not going to speak for their industry, but I think, like, their talk about speed to market and waiting that long to get to the queue and to get your air permit on something that's able to run more is probably problematic.

JUDGE HUDSON: Yes, Mr. George?

MR. GEORGE: Yeah, I just want to respond real quickly. I agree a hundred percent that it's not a panacea, and it should not be looked at that way. I think, you know, in large part, the co-location and co-development that we are seeing is in response to things like queue times and permitting challenges.

And so in an ideal world, we have robust planning processes that allow for us to build generation, the utilities to build generation on a timeline that we need to see it. And so, again, that gets back to the -- to the collaboration point. Like, that there is a way that I think large loads can bring with them generation to match the load that they're bringing to the system, but agree fully that it should not be viewed as a panacea.

JUDGE HUDSON: Mr. Jaramillo?

MR. JARAMILLO: I just wanted to comment -- and you heard from the gentleman from Loudoun County from the panel, from the past panelists -- there is a situation where our data center has built on-site natural gas generation, and they went through the air permitting process in quite record time, I would say, and they did not go through a CPCM like a utility would. They did it on-site, and it's running 24/7.

JUDGE HUDSON: Thank you.

Mr. Crenshaw?

MR. CRENSHAW: Yeah. The only other point I'd make is that, as we've seen data centers start to spread out from their traditional hubs, that co-location with renewables becomes more feasible.

Additionally, as you -- storage is starting to become more economic, that the addition of storage and solar together will be something that will be more feasible as we go forward.

JUDGE BAGOT: On the -- on the co-location piece, is there, to the extent you know in Virginia, would there -- for it to truly be a viable option, are -- would there need to be changes to our retail choice provisions?

Because I'm assuming if you're talking about a new customer and a new generation, it seems unlikely that that arrangement would be flowing -- or in conjunction with an existing utility service provider.

Maybe that's not the case, in which case maybe you can tell me how you think that might work. But if you can talk a little bit about how the retail choice provisions in Virginia might play into the availability of co-location?

MR. GEORGE: Yeah. I'm happy to speak to that briefly. I mean, I think, you know, a lot of it depends on the terminology around co-location. I've noticed that it can mean 17 different things, depending on who you're talking to.

But in general, I think if we're talking about co-location in front of the meter, right, a

resource that the grid operator can see, I think there are, for existing retail choice customers or advanced renewable buyer customers, there are options to do that today. I don't really know what would need to be altered significantly to take advantage of that.

I do think there could be more opportunities to potentially contract with resources outside of Virginia to meet Virginia load that may require additional tariff provisions. But that -- I don't -- based on existing statute, I think that option would be pursuable today.

JUDGE BAGOT: All right.

JUDGE TOWELL: Mr. George, if I remember correctly from your prepared comments, you referenced some of the work that Google has done down in South Carolina with respect to winterization. I think you also referred to some of that in your opening comments today.

Can you help me kind of understand Google's position, or any data center's position, on how to incorporate those types of activities in a more broad-based, traditional utility dynamic?

I can certainly understand a lot of upside for lots of reasons why a company would be interested in doing that. But once we get within this building,

some of those dynamics are a little more challenging when we have to kind of move through the utility to get to the customer to see how we could realize any of these benefits.

MR. GEORGE: Yeah. Thank you for the question. I think what's really unique about the types of investments that we're making in South Carolina and in Indiana, and actually here in Virginia, is we're using our money to fund that, right?

And so we're not using additional ratepayer money or money that has been set aside for other, you know, purposes from other sources, right? We're taking direct corporate funding to provide that and directly inject it into the system.

I think from our perspective, we would be happy to see those grow and become more scalable. I think that's one way to more directly use our investment to support the system. And I think we would be happy to do that.

I don't -- you know, it's -- I don't want to speak to how that can translate directly into, sort of, increased utility participation; it's a little outside of my lane. But I think for our purpose in this conversation, I think additional direct funding from corporate off-takers is an opportunity to scale up

those programs with more significance.

JUDGE TOWELL: Mr. Vaughan?

MR. VAUGHAN: Just to clarify, that the funding Mr. George was talking about in the Indiana example, is that outside of utility programs.

JUDGE TOWELL: Correct.

MR. VAUGHAN: So they're providing a community action group that's going to make that happen. So whatever gets done with that money isn't subject to the same type of cost benefit, payback tests, and whatnot that's in the code here when we -- utility comes in and proposes energy efficiency programs. So two different lanes, you know, to try and -- try and drive the same thing.

JUDGE TOWELL: Thank you.

JUDGE HUDSON: What would be helpful for me, Mr. George, you brought up South Carolina, you brought up Indiana.

If the entire panel can, kind of, talk about some of the lessons they can learn from other jurisdictions that, kind of, successfully implement some collaborative solutions to some of the challenges?

MR. VAUGHAN: I can kick it off.

MR. JARAMILLO: We would have to pass on that since we're strictly Northern Virginia.

MR. VAUGHAN: That's fair.

Lessons learned. I think -- I think some of the big lessons learned we've seen throughout the process start with some of the earlier conversations, the analytic forecast. And I absolutely agree.

And I can't remember, it might have been on the first panel, one of the gentlemen from Dominion talking about that we might have five customers all putting the same project in the queue or whatever. And having the right framework in place and having the right financial commitments, it narrows that down, right?

And so you end up with who has the option on that land, who is willing to make the financial commitments to do the studies, to contract for the infrastructure, to move it ahead. So I think, in my opinion, that's the best practice. We've seen this happen across multiple states and kind of come to the same conclusion there.

I think other lessons learned is, like, it goes back to some of our comments earlier. I think these large-load opportunities should be taken as that; they're large-load. Don't say it's a tariff for one industry, right? Go back to Mr. Brombrind's (phonetic) principles and do that. It's more of a -- more of a

collaborative environment, then, rather than adversarial.

And then, you know, we've been able to -- we've been able to come up with protections that the industry, and the utility, and the consumer advocates have all agreed on. So I think having those three distinct points of view come to agreement is -- it's very helpful. I'm really hoping that it gets approved, and you might see something like it in Virginia in the near future, but, you know, from Appalachian Power Company.

But those -- I guess those would be my lessons learned.

JUDGE HUDSON: Mr. Crenshaw?

MR. CRENSHAW: Sure. So I think that it's hard for me to point to a specific example. But I would say even within Virginia, I think one of the things that's made -- that's been successful for customers and suppliers like us is the flexibility that we're allowed with having a market structure.

And so having the ability -- you know, customers have the ability to manage their costs within this market structure. And so having a flexibility on what their tariff structure is or what their costs are allow us to structure solutions for them from renewable

assets that, kind of, meet their needs.

And so I think that has worked here. It works in other RTO-type markets, as well, where we've had structured transactions that fit the customer's individual cost structure specific -- or, precisely, or as well as they can.

But I'd say that's one of the success stories, lessons learned, or good features of Virginia.

JUDGE HUDSON: Thank you.

JUDGE BAGOT: So since you did not have an opportunity to talk about outside of the jurisdiction, Mr. Jaramillo, I will ask you.

There was a little bit of a discussion earlier about -- with some of your co-op counterparts about needing to make certain changes, or certain changes would be helpful, like aligning payment and billing, or more frequent payment and billing, other sorts of things like that, or increased collateral, or -- I'm trying to think of some of the other things that were mentioned.

But from your experience, do you see need for improvement in those areas? I know one of the things that was also talked about today is that, sort of, the nature of these data center customers is changing a little bit from what the first round, first wave of

data center customers might be.

So do you see a need for, sort of, more robust, or changes to, the parameters that have been working for NOVEC? Or do you see them continuing to work well into the future, even with these new data center projections?

MR. JARAMILLO: So NOVEC, we energized our first data center in 1998 with AOL. So we've been working with these data centers since then. And our contracts have evolved over the years.

But through our power supply agreement -- our retail's power supply agreements, we tried to cover, we think, all those issues that you have raised, collateral, credit requirements, weekly billing, transmission costs, PJM costs, you know, parent guarantees.

And we've also separated that agreement from the infrastructure agreement, the electric service agreement, where that focuses on the local infrastructure, the substation, the delivery costs.

So I don't know of any improvements that we would do -- that we would need at this time, because we try to address them as they come up.

JUDGE BAGOT: Okay. Thank you. Appreciate that.

JUDGE TOWELL: I have a broad follow-up question about NOVEC's experience in particular. I believe in some of your prepared comments, you note that in eight years, you forecast that NOVEC's data centers will comprise -- and I believe I have this right -- more than 95 percent of NOVEC's energy sales?

MR. JARAMILLO: That is correct.

JUDGE TOWELL: What, if anything, do you believe -- how, if at all, do you believe that that volume of load is going to, or has the potential to, change the very nature of what it means to be a cooperative in Virginia?

MR. JARAMILLO: Well, so that's going to probably represent maybe 70 customers or so. But we still have 183,000 customers that we serve. So we're very much a cooperative still.

The -- but you're right. You know, 95 percent of sales coming from just a few customers is very concerning, but there's also great opportunity for the rest of the membership as well.

JUDGE TOWELL: Thank you. And then a -- kind of a follow-up question is also related to the data center load that I believe you mentioned in your remarks, and then at currently it's only 40 percent of contracted capacity.

What accounts for that kind of ramp dynamic, and how long is it on average?

MR. JARAMILLO: Yeah, so we were very specific to state that in our testimony because you hear different, you know, different thoughts on load forecast. Load forecast is such a big topic today.

So the hyperscalers, you know, the big end-use data center customers who are building for themselves, they ramp up very quickly. What I call the REITs or the, you know, the hotel, the co-location data centers, the speculative ones, they have a whole different ramp.

And I think various colleagues have said, you know, they're all competing for the same business, only one's going to get it. So the other ones may have to wait until the next contract at the end that they're awarded. So they have different ramp schedules.

But overall, if you just look at all the data centers we serve, at that particular time, that's where we're at. Next year, it may be different, you know, depending on what type of data center we're hooking up. Suddenly, they range the gamut from, you know, 20 to 70 percent of what their contracting capacity is.

JUDGE TOWELL: Okay. So just so I'm clear on that component, that 40 percent isn't a number that is

going to necessarily increase next year as more data centers ramp up more fully because you're continuing to have contracted entities adding in the out years; is that correct?

MR. JARAMILLO: That is correct. I mean, you heard a figure of one of the co-ops that had ordered, like, 29 power transformers. Well, we have twice that on order for the next ten years.

JUDGE TOWELL: Okay. Thank you.

JUDGE BAGOT: Really quickly, I want to go back to the discussion earlier; we were talking about whether data centers look different than other types of industrial customers in the GS and GS-3 and GS-4 customer classes.

And earlier today, in response to Judge Towell's question about, sort of, what makes data center customers different, there was a discussion about their ability to react with respect to maybe demand response or other sort of responses to changing energy needs on the system.

And so I'd like to hear from you all. One, what are data centers' ability to engage in demand response and other, sort of, demand-side management activities? Is that -- does that make a difference, truly, or is it just sort of on the margin? And is

that a basis for differentiating data centers from other industrial customers?

Mr. Jaramillo?

MR. JARAMILLO: To date, the data centers that we serve do not participate in demand response programs for the mere fact that their air permits do not allow them to do that. They do not put the necessary scrubbers on the diesel generation, so they are restricted to the hours they can run for emergency purposes.

JUDGE BAGOT: Okay. So meaning that they don't use their backup generation, sort of, to peak shave or reduce their demand at the meter?

MR. JARAMILLO: Absolutely.

JUDGE BAGOT: Okay.

MR. JARAMILLO: They do not.

JUDGE BAGOT: And then they don't engage in any, sounds like, other, sort of, adjustment to their meter demand? They -- it is -- their load is what their load is, and there's no other capability that they have to be responsive?

MR. JARAMILLO: No, they can move their load from one data center to another data center in another state. They could bring down their operation here and bring up an operation somewhere else. I mean, that's

the whole idea of redundancy for -- with these data centers.

JUDGE BAGOT: But that's not something that you typically have --

MR. JARAMILLO: We have not seen it.

JUDGE BAGOT: -- seen? Thank you.

Mr. George?

MR. GEORGE: Yeah, so a couple thoughts. I think there -- the opportunities for demand -- or for data centers to be flexible don't immediately and only mean we have to run our diesel gen sets, right?

As Mr. Jaramillo mentioned, we do have the ability now to shift workloads across servers. Right? Since -- for Google, we've been doing this since 2020, it's on our carbon intelligent compute ability. But it enables us to shift certain non-essential workloads to different regions as it was designed based on carbon intensity of a certain grid.

Fast forward, right, we have been able to translate that to an ability to not just shift workload to the two regions, but actually reduce workloads at facilities in response to pre-emergency conditions. Right?

If we -- if we see that we are starting to face constrained operating conditions, we have worked

with our utility and RTO partners to actually reduce capacity at that facility without relying entirely, right, on diesel gen sets.

And so I just -- I frame that up in a way that, like, I think there is opportunity here to think about, what does a protocol look like when we are facing pre-emergency conditions?

I say pre-emergency because I was at PJM last week and we kept referring to emergency conditions, and they said no, it's pre-emergency.

And so I think if we can align with our utility partners, our co-op partners and the grid operator as to what that type of framework would look like, how we would respond, what the steps to follow are, I think there's a lot of potential to be a more traditional, sort of, load reduction type resource.

JUDGE BAGOT: Mr. Vaughan?

MR. VAUGHAN: I'll just briefly add that, I mean, again, when you're looking at data centers versus traditional industrial, right, there's, within the other traditional industrial segments, I mean, there's certain operations that are willing to do DR and there are certain that aren't, you know?

I mean, one primary metal operation may not have the technology to do it. It may ruin -- you know,

a multiple-hour eruption may ruin their infrastructure. And so, like -- to Mr. George's comments, you've got to align what the new data customers may be able to do with the RTO rules as well. Like, well, they may be able to move something around. If PJM calls a 20-hour, you know, capacity performance interval, can they -- can they really drop for that long? Does that fit with their business model? So it's all a matter of getting the right -- the right programs and the right rules in place.

JUDGE TOWELL: How common is that ability to shift work from one footprint to another? And, you know, I kind of ask this of everyone.

Again, Mr. George, because those of you that are in the kind of power supply business have potentially expertise with other facilities that may have this ability or may not. And those of you in, kind of, -- in the other parts of this space may have had some experience with this and trying to figure out how commonplace or unique this particular feature is in the data center space.

MR. VAUGHAN: I can tell you from our perspective, we don't have the experience yet with the data customers moving that around.

Our large demand response programs, our

traditional industrials either interrupt their process or bring on cogeneration. Right? It's mostly interruptions, so they're not shifting the work somewhere, they're taking a shift off to reduce operations.

JUDGE TOWELL: Okay. Thank you.

JUDGE BAGOT: How does -- and this really, truly, is an education moment for me, talking about shifting your load from one location to another for pre-emergency conditions or otherwise.

How does that factor into, sort of, the larger discussion we've been having about load forecasting. Right? Not all load is the same depending on where it is on the system.

It also seems to me that if there's a redundancy in two -- in having multiple locations, that that might have rate implications in terms of recovering system costs if, ultimately, you're using less than you thought you would because you have a redundancy.

So, Mr. George, I'll direct it at you, but to the extent others have insights into this, I'd be curious to know how that operability does come into play with these other questions we've been addressing today, if at all.

MR. GEORGE: Yeah, it's a good question. Thank you.

So I'm going to zoom out for a second and maybe talk about, sort of, the broader siting decisions in the first place, right? If you think about the types of services that we're providing, we are providing our services in response to customers.

And so depending on the type of customer that is, for example, for us, if it's a Google Cloud customer, they have very strict latency requirements on their product. And so that does drive us to invest within certain physical locations, right? It's why you continue to see investment in Loudoun County and elsewhere in Virginia.

And so you're always going to have some element of the workload that is going to be sensitive to that distance from the customer.

And so maybe moving forward to your question, I almost like to think about it in terms of, like, peak workloads and base workload, right? We're always going to have some level of constant base workload that we're going to have to plan for.

The peak workload that we can shift around is relatively small. Right? And so I think we're just now getting to the point where we're adding significant

amounts of megawatts of load to really see what those long-term, like real, sort of, grid peak shifting opportunities are in terms of infrastructure investment.

But I do think -- I do think there is some opportunity on the margin. We're just -- we're still kind of learning as we as we -- as we go to the extent how, sort of, long-term that shifting ability can be, and, like, if it can actually impact infrastructure investment.

JUDGE BAGOT: Thank you.

JUDGE TOWELL: Just a quick follow-up on that. And I'm not asking you to speak for another member of the community, but I did see in the JLARC report that an unnamed data center customer I said -- I believe said something along the lines of, well, there may be some opportunities for, you know -- I think it was largely in the discussion of demand response -- but said at the end of the day, a 200-megawatt data center is going to be a 200-megawatt data center.

It sounds that -- it sounds as though for certain business models, it's important to have a level of redundancy in order to keep some things moving forward.

But has that been the experience that most

people have seen, is that data centers are going to plow back in any efficiencies into the existing systems that are built? So in the end of the day, there's not going to be a lot of extra available. Is that correct? Additional capacity in any particular facility. You build to your maximums.

Mr. Smith?

MR. SMITH: So I say that's the -- that's the intention. And there are limitations in the past that have prevented data centers from being able to reach their maximum capacity. But where we are today, that is being tested.

JUDGE BAGOT: Okay.

MR. SMITH: It's being pushed to the next level.

So whereas, you know, if you were to look at what utilizations look like, maybe four or five years ago, you'd see those, you know, some people hovering around 40, 50 percent. Hence, you start to see rates kind of lie in that area. And then you see a more sophisticated data center probably somewhere in the 60, 65 percent range.

That's going to change. That, without a doubt, is going to change as, you know, obviously these technologies get more efficient. People figure out how

to push the boundaries, how to do more with less.

You're going to see those utilizations creep up to even what you saw from perhaps your data center customer four or five years ago. They're now have moved into a new tier of being able to deliver at one time 40, 50 percent, they're now at 60 65 percent. And your customer that was up at 70, 75, you can see them going into the 80-, 85- 90-percent range.

JUDGE TOWELL: Thank you.

Mr. George?

MR. GEORGE: Yeah, and I would just add, I think, again, for now, I mean, we are still planning for the peak. Right? I think as I've heard pretty much everywhere I go, there seems to be almost a thought that, you know, more strict AI kind of training workloads may be more flexible than, sort of, more customer facing workloads. That may be true.

And if we get to the point where we're getting significant experience with those types of loads, where we see the impact in a way that could meaningfully change how we plan for that peak, I'm not -- I don't want to say that's off the table.

But I do think if we can get some more clarity, sort of, in the near term on what our near, like what those sort of demand reduction opportunities

are, I think we have enough confidence if we understand the parameters, if we understand the protocol that we're going to be adhered to when we're facing a pre-emergency-type event.

That gives us the certainty that we need to see to be able to actually translate that reduction into system development.

JUDGE TOWELL: Thank you very much.

JUDGE BAGOT: I have some general questions about how the Commission can be helpful going forward and where you think room for collaboration and improvement exists.

One question I want to tee off, though, just to get your general thoughts on before we get there, are -- another issue that came up is making use -- the best use of the system we have now.

I think, Mr. George, you mentioned it.

But I think it's come up elsewhere today. So if you think about re-conductoring, if you think about GETs, if you think about others, like, dynamic line readings, those type of technologies, how much -- where do those fit into this?

How much of a difference do you think they make, and does it change, sort of, our cost-benefit analysis when we're looking at these types of

technologies, knowing what we're going to need to do in the future in terms of infrastructure development to meet the growing demand?

Has it sort of changed our cost-benefit analysis of where these technologies may or may not be useful or employed?

So I welcome any thoughts you all have on, sort of, the role those play going forward.

MR. CRENSHAW: So, first, --

JUDGE BAGOT: Mr. Crenshaw?

MR. CRENSHAW: -- I mean, not from a data center perspective necessarily, but from just the amount of generation that we need to build, I'm surprised that we wouldn't be looking at all those technologies as a way to optimize the transmission system as a table stakes.

So from our perspective, we'd be very supportive of grid-enhancing technology, dynamic line reading, that kind of thing. You know, In concert with all of the other Q reforms that are going on.

JUDGE BAGOT: Yes?

MR. JARAMILLO: I would just echo that. We are very supportive of any GETs, you know, utilization that could be done through dynamic line reading. Anything to -- as we have seen in our comments, we're

very concerned about the transmission costs continue to go up year after year. So anything they could do to pause that would greatly be appreciated.

JUDGE BAGOT: Yes, Mr. George?

MR. GEORGE: Yeah, and would just add, I think where we have seen deployment of things like GETs here in Virginia, right, we've seen tremendous benefit from that. And so I think we all have an interest in figuring out collaborative ways to move that forward.

As I mentioned earlier, this idea of innovative tariff rate structures. Right? If there's an opportunity for us to more directly fund investments in things like grid-enhancing technologies through some type of innovative structure, I think that is something that we're -- we're absolutely open to as well.

I would also point back to, you know, a little bit outside of the scope of this discussion, but the challenges around permitting and siting new transmission infrastructure. Seems to me like we ought to be making use of every ounce -- that's maybe not the right word -- but every bit of juice we have on the grid today as it will make those permitting, siting discussions potentially more palatable. Right?

If we can go back and say, look, we're -- we've maximized everything we have today

before we've decided that we need to build this new piece of infrastructure, it seems like that could go away -- long way from a permitting perspective.

JUDGE BAGOT: Are there examples of those sorts of innovative tariff structures that you've seen in other states that have worked well that you could point us to --

MR. GEORGE: Yeah.

JUDGE BAGOT: -- as an example?

MR. GEORGE: Yeah, so the first one that comes to mind is, I mentioned earlier our investment in the FERVO enhanced geothermal asset in Nevada. That, of course, was a generation resource, but we were able to do that investment through a structure that we called the Clean Transition Tariff.

This was done in partnership with NV Energy, who is the utility there, and subject to approval by the PUC of Nevada.

We think there -- that is a tool that could be replicated to address investments in things like grid enhancing technologies, and I'd be happy to follow up in our post-conference comments about what that could look like.

JUDGE BAGOT: Thank you.

All right. I was going to jump to just a

general question about -- so we've heard -- one of the -- one of the themes, I think, we've heard today is greater coordination and collaboration in terms of information sharing, in terms of maybe state involvement at the PJM level, so state-federal collaboration, utility-federal-state collaboration, or collaboration between various utilities and their customers or utility to utility.

So from your perspective, where are the gaps, and what are some things that this commission can do to help fill those gaps?

Yes?

MR. JARAMILLO: Well, I think one that we've been discussing quite a bit today is transmission allocation, where it kind of spans between FERC and the state. I think if there was some commonality on how to allocate those supplemental transmission costs rather than socializing the upfront costs, you know, that would certainly be an area.

JUDGE BAGOT: I'm not sure who's next, Mr. Vaughan or --

Mr. Crenshaw, all right.

MR. CRENSHAW: Okay. I'll go quickly.

I think -- I'm not sure if this is really within the purview of the State Corporation Commission,

but, you know, as we're building out both types of infrastructures, the data center load infrastructure and the generation infrastructure needed, and the transmission infrastructure needed to support all of that, the permitting questions that we have in the state need to be standardized.

And, kind of -- so some clarity and, you know, certainty of permitting is necessary for all this investment to happen. And so, you know, that's the kind of thing I think that will need to happen over the next few years, is that we're getting more certainty of permitting.

JUDGE BAGOT: Thank you.

Mr. Vaughan?

MR. VAUGHAN: On a Virginia-specific issue that the Commission could help with, when it comes to the RPS standard and being able to meet our obligations in the least reasonable cost manner, my pre-filed statement of position, I mentioned a couple things that could help.

Mainly around, right, there's a dynamic here, between, you know -- Virginia has the advanced renewal buyers portion of the law. But before that, you still have corporate buyers that are out there signing virtual power purchase agreements or however they're

settling them.

But they're signing up RPS-eligible projects. And remember, these are -- these aren't regulated utilities. They don't have the same burden as we do. They don't have the same regulatory process as we do. They can act a lot faster.

So anything the Commission can do through legislative advocacy or approving alternative structures in our cases to make the utilities -- help the utilities even the playing field from a commercial perspective being able to contract for the same projects in a faster manner to get those projects, those savings, the lower-cost projects to all of our customers, not just the large, sophisticated renewable energy buyers.

JUDGE BAGOT: Can you -- just for my own education, can you talk a little bit about the difference between what a corporate buyer versus you, as a utility, would have to engage in that, sort of, creates that issue?

MR. VAUGHAN: Certainly. So let's say APCo and a corporate buyer both put out an RFP on the same day. Let's say it's a 30-day window. We get the bids in. There's only so many projects out there in the RTO that are available.

APCo does look across PJM for projects. We're -- we do look specifically in Virginia as well, but, you know, our portion of the RPS code is a little different than Dominion's.

And so we -- us and that corporate buyer both get some number of the same projects from independent third-party developers. And so we both do our analysis in the same time, and we both say, great, I want these three projects.

And we go to the developer, and we say, okay. We're ready to sign with you. Here's our regulatory process, where it's going to take us a month to put this filing together, and then it's a six-month -- six-month approval process through litigation, and then you've got to wait 30 days for it to be appeal-proof. Right? And so we've got eight months there.

If the corporate buyer says they go through their governance, maybe the next week they sign the project. You know, So it's just without the -- they don't have the regulatory span that the utilities do.

And we personally think the 90-day prudence option that's in the code is helpful. It cuts that down a lot. It makes -- it makes us a lot more efficient with those developers being able to say, hey, it's a lot shorter time frame than six months.

I mean, in some of our states, it's a year. And it's really hard to be a third-party developer and hold a project that long when there's so much demand out there for the same projects, right? Because of siting, because of other issues, there's only so much to go around.

And so any way that we can expand that and just make the process faster without compromising prudency. Right? We all -- we all want to do what's right for customers here, and, you know, that's an improvement we think could really help.

JUDGE BAGOT: For you, just out of curiosity, to the extent you even know, are you typically competing in that instance with corporate buyers that are outside of Virginia, that are in the larger PJM area or is it --

MR. VAUGHAN: Yes, absolutely. It's all through the PJM states. All the corporate buyers, they all have a different flavor of what meets their --

JUDGE BAGOT: Uh-huh.

MR. VAUGHAN: -- needs. But when we're looking at our COI, if there's a load in Ohio or New Jersey or Pennsylvania, and they're doing the same thing, you know, that's who we're competing against.

JUDGE BAGOT: Okay. Thank you.

I'm not sure who was -- who was next.

MR. SMITH: I think I can go, so thank you.

JUDGE BAGOT: Okay.

MR. SMITH: A place that would be very helpful in the permitting -- or not the permitting process -- but in getting properties zoned would be the transmission route. So as we all know, ultimately, the State Corporation Commission chooses the transmission route, but a question that you often get as a developer of large load users, where's the transmission coming from?

And there's, you know, ultimately, limited information that Dominion can provide with the ultimate answer coming from the Commission. But from the developer's perspective when going for that zoning, it's becoming not to be a satisfactory answer to say, well, the Commission ultimately chooses the transmission route.

So if there were a way we could accelerate route approvals or accelerate route plans such that the transmission route or the most likely route we could present to those boards that have to make those tough votes, that would really go a very long way.

JUDGE BAGOT: Can I ask a little more? So when they're asking questions about where the

transmission is coming from, is it a concern that the transmission is going to be there when they're -- when the load is there and they're ready, or what is it -- what is the customer's concern, I guess, in terms of the actual route?

MR. SMITH: The physical location of the transmission towers and how it will ultimately impact the communities that they serve.

JUDGE BAGOT: Oh, I see. Okay.

MR. SMITH: And then there's also the other one, too, but the primary one is where is this transmission going to go, how is this going to change our view shed.

JUDGE BAGOT: So it seems to be more like a risk assessment, in terms of the customer trying to make a decision about how viable their project may be based on permitting and community activism, things like that that may -- that may put their project at risk or delay it?

MR. SMITH: Right.

JUDGE BAGOT: Okay. Thank you.

Mr. George?

MR. GEORGE: So I'm going to put my FERC hat back on for a moment, and I know I have -- we have two former FERC colleagues here. Hopefully, you'll

appreciate this.

I think there is often a pretty big gap in folks at FERC who understand the state regulatory piece, right? And given how intertwined the two are and increasingly intertwined they're going to become, I think there's real opportunity to build up that, sort of, cross-knowledge base, and I think things like the NARUC State Federal Task Force are a good way to go about that.

But I -- that -- there's just a severe lack of institutional knowledge, and that's not a knock on the Commission, that's just that's what they regulate, but it's really impacting decisions.

And, you know, one example is the -- is regional transmission, right? I think there may be a view, particularly among some at FERC, that regional transmission projects are the best way to plan for all transmission projects going forward. We know that's not the case, right?

There are -- there are buckets of projects like supplemental transmission projects that are required to resolve things like reliability needs on a near-term basis that just simply don't work well within that regional framework.

And so I think there's, almost back to the

transmission allocation point, I think there's lots of opportunities to collaborate and think through how the system works, and how can we promulgate regulations from both the federal level and the state level that make the most sense for the entities in the state.

The other thing I would say is, that also extends to PJM. One area that I found a lot of frustration with PJM is that there's often not a strong level of commercial understanding of, sort of, the impacts we're seeing on the grid.

One example, we have continued to struggle to find new clean energy resources across the PJM footprint to bring to the grid. This is the interconnection queue challenge. Right? And if you ask PJM, they've just cleared several hundred gigawatts of capacity through the queue. And so there's just this fundamental mismatch between what we're seeing on the ground from the commercial teams and what the RTO is seeing that I think is reflective of this broader sets of silos that we're all operating in.

So I think there's real opportunity for you all to engage both at FERC through things like the joint task force and through OPSI to engage more directly at PJM just to make sure we're all at the same baseline level of education.

JUDGE BAGOT: Thank you.

Mr. Jaramillo, you mentioned that one area we can be helpful is in the transmission cost allocation. Can you talk a little bit more about that?

What sort of factors -- to the extent our existing allocation is not, in your mind, allocating transmission-related costs appropriately -- what factors should we be considering when we're looking at how we should be allocating costs to data center customers versus other customers on the system?

MR. JARAMILLO: I think one of the terms that have been thrown out has been last mile of line. So when Dominion has to build that last mile to hook up a switching station to a dedicated substation, but yet that switching station and that last mile of line, those up-front costs are socialized among all the ratepayers.

If there could be a way to, you know, fire shop those costs straight to the data center, those up-front costs, and not affect the other ratepayers.

Because, you know, last mile of line, the reliability that the residential customers are going to receive is, you know, very nil.

JUDGE TOWELL: Related to that question, how would -- how -- folks account for additional growth

that's sprung off of that last mile, to the extent that there was additional growth?

Don't we run into a first mover problem even within that last mile? Or are there mechanisms that exist to ameliorate that down the road?

MR. JARAMILLO: Well, when I say last mile, a lot of times it's not even a mile. It could be -- it could be a half-a-mile. And there's nothing going to be in between.

JUDGE BAGOT: Okay.

MR. JARAMILLO: You know, sometimes, sure, it's going to be two or three miles. And possibly, yeah, there could be other delivery points coming off, you know, those -- that transmission line. And probably good planning probably allows for it.

But, you know, when it's obvious that, you know, this line is just for this switching station and just for this data center customer, there should be a way to, you know, allocate those costs directly to that customer.

JUDGE TOWELL: Thank you.

JUDGE BAGOT: All right. I don't have any other further questions. So I'm going to do what I did before and tee it up for final thoughts that you all may have.

And so I would say feel free to recap the one thing you want us to walk away from from today or answer the question you wish we had asked you but we didn't, whatever you decide.

I'm going to start, as I did last time, on my right with Mr. Crenshaw, and I'll move to my left.

JUDGE TOWELL: And before we finish, I'd just like to note, you may have been in some technical conferences in some other states that lasted until 11 o'clock. That is not the case in Virginia.

JUDGE HUDSON: We are very efficient in Virginia.

MR. CRENSHAW: Yeah, no, thank you. Appreciate it. Again, just thank you for the time. I think, you know, it's been a very informative conference for all of us, and I've definitely learned a lot.

MR. SMITH: I think from an IPP perspective, you know, continuing to work on how we can bring generation into Virginia is going to be the thing that's going to help with this -- be a part of the solution here.

Actually, going back to the network upgrades and the cost, I'd say utilities must be empowered to build ahead of the forecasted of demand. This requires

clear regulatory frameworks that mitigate the financial risk of upfront investment. This includes tariff provisions, securitization mechanisms, and flexible cost recovery structures that can provide the certainty needed to move at the speed required.

And then the last thing I'd like to say is, we often talk about what happens if we -- if we under-forecast. What happens? Or, no, I'm sorry, there's more emphasis put on over-forecasting than emphasis put on under-forecasting.

And to that I say, you know, just recognizing the critical importance of this issue, the White House has established a task force on AI data center infrastructure, prioritizing AI data center development as a matter of national security and economic interest.

So if we keep that at -- closer to the sensor than it has been, I think that will open us up to some innovations to help us move forward and keep Virginia where it is in terms of being the data center mecca of the world.

JUDGE BAGOT: Thank you.

MR. CRENSHAW: MR. JARAMILLO: First of all, just thank you for allowing NOVAC to be here and for hosting this type of conference. It's very timely.

And thank you for the discussion in

transmission allocation. That was probably one of my key issues I wanted to discuss and was able to discuss that, so thank you very much for that.

With that, nothing else. Thank you.

JUDGE BAGOT: Thanks.

MR. CRENSHAW: MR. GEORGE: I just want to echo my appreciation as well. I think, you know, there has been, obviously, robust conversation, but I think actually a fair deal of alignment and in what can be the next paths forward.

I think we've heard a lot of good alignment around things like the need for more stringent, upfront, and over-the-term-of-the-contract financial requirements from new, large loads connecting to the grid.

I think from our perspective, that is our way of raising our hand and recognizing that status quo is not sustainable. How can we come to the table with solutions that work for us but also work for the partners that are providing this service? And so I think there's real opportunity there.

I would also be remiss if I didn't take the moment to put on the record the fact that I am the only one of my hyperscale representatives here today. So thank you for the opportunity to be here, and we look

forward to next steps.

MR. CRENSHAW: MR. VAUGHAN: I guess the one -- the one thing that was brought up that I didn't get a chance to touch on that I'll brush on with you all is the MBR discussions, market-based rates.

You know, potentially it could just be an issue of cost allocation, but I caution the Commission on, you know, it's partial choice in Virginia, but to not advocate your ability to be the reliability backstop, just don't hope that the market builds it. Right? Because the capacity market is not going to build the infrastructure we need here.

So while it could be a potential tariff offering, potential cost allocation tool, it's, in our opinion, it probably isn't the long-term utility planning tool to get the resources built to provide safe, reliable service to customers over the long-term.

And with that, the one thing I would sum up today is that our takeaway would be that the existing -- - at least for Appalachian Power Company -- the existing terms of service do need updated. They need enhanced to take full advantage of the low-growth opportunity we have here in the commonwealth, and Appalachian Power really appreciates the opportunity to come and speak today. Thank you.

JUDGE BAGOT: Thank you. Thank you all to our Panel 3 for wrapping up a long day.

I just want to say -- before I turn it to my colleagues for any final remarks -- I just want to say a huge, heartfelt thank you to all of the panelists that participated today, for all the panelists that self-nominated.

This was sort of a test case for these sorts of technical conferences at the Commission.

I'm going to proclaim it wildly successful based on the conversations that we had today. I certainly learned a lot, and I think the dialogue was really engaging and helpful, and I appreciate the back and forth.

And I think, Mr. George, you're totally right, that something that is promising is the level of agreement among the parties in terms of the sorts of things we should be thinking about and the direction that we could take this.

So I certainly hope that the Commission will play its respective role in developing solutions going forward.

But as I mentioned in the beginning, it can't just be one regulator, one legislator, one utility, one customer. And so I think we're all in this together,

and I think the showing today really shows that I think there truly is collaboration that's happening in order to solve this problem.

So thank you all so much for participating today.

One housekeeping matter: as I mentioned at the beginning, we are opening it up to post-technical conference comments to everybody, panelists, non-panelists, those members of the public that were listening, or anybody else that has -- would like to respond to anything that was discussed today or in the pre-conference -- or the pre-filed comments to this conference. So we will be issuing an order which lays out the specifics on how to submit those comments.

But just, tentatively, for planning purposes, we're looking at a date of January 17th, which is the Friday before the long weekend, so hopefully you all can enjoy that long weekend instead of working through it. So that's January the 17th for post-technical conference comments.

And, again, we will issue an order that provides a little bit more detail. We wanted to get that out there for you all.

So with that, I will turn it over to Chairman Jehmal Hudson for any additional comments.

JUDGE HUDSON: Thank you, Judge Bagot.

And quickly, I just want to say thank you to all of you for your active participation in today's technical conference.

The challenges we've discussed today are not hypothetical. They are immediate, they are real, and they're accelerating. That's why it's very important that the work we do here, and the solutions that we've tried to come up with today, we do it collaboratively. And, basically, that it's very critical to ensure that the challenges that we addressed are proactive and equitable.

As Judge Bagot has mentioned, please definitely file your comments, and please include your best ideas, innovative, thoughtful, and practical. We will definitely read them, and they will be essential in shaping the path forward.

As I close, I just want to acknowledge two people today. Unfortunately, one person has left.

Mark Christie, the current FERC commissioner and the former Virginia State Corporation commissioner, as well as Angela Navarro, the former Virginia State Corporation commissioner.

Thank you so much for being here today. We loved that you're here today. Thank you. And that's

all for me.

JUDGE BAGOT: Commissioner Towell?

JUDGE TOWELL: Just briefly, I'll echo my colleagues thanks to everyone who's participated, especially the panelists on panels 1, 2, and 3. Also the members of the audience who have come here to get additional information and to hear the back-and-forth, as well as those folks who may be participating via the webcast.

Data centers are -- and large load users are a -- are a very important part of what is being discussed here recently when it comes to the energy profile here in Virginia. We've seen it in the JLARC report. We've seen it in the bills that have been filed in the General Assembly. We see it just through the mechanisms that are -- exist here in the commonwealth and elsewhere in PJM and FERC.

So thank you all for helping us just become more educated on the issues that are associated with relatively new, large load consumers and what that means for the footprint as a whole.

And I hope that you all enjoyed this as much as we did.

JUDGE BAGOT: So with that, I will adjourn for today and say thank you very much and happy

holidays.

(Off the record at 4:35:39 p.m.)

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December 20, 2024