# FOUNDATION OF THE ENERGY LAW JOURNAL SYMPOSIUM ON DATA CENTER ISSUES

Symposiums are a great way to solicit a lot of information in a relatively short amount of time (relative to writing an article). The Journal editors periodically wield this tool for hot topics. Not much is hotter than data centers in our industry today. Energy professionals are busy advising on grid interconnection, power procurement, regulatory structures, and project development and financing for all types of data centers from both the consumer and power producer perspective. Meanwhile, policy makers and those responsible for serving unprecedented forecasted load are struggling to keep up with the demand in a strategic, sustainable manner. A group of editors, FELJ Board Members, and friends of the Journal recruited a high-caliber panel from a variety of perspectives to discuss challenges, solutions, and opportunities posed by the data center boom. Following is a transcript of our discussion, which we held in a hybrid format before a large audience on February 19, 2025, in Washington, DC, and online. We hope this provides useful insight into some of the complex issues and prompts further discussion and creative solutions. Enjoy.

> Kat Gamache Executive Editor, ELJ

Moderator: Caileen Kateri Gamache Panelists: Ronnie Bailey, Mason Emnett, Karen Khamou Ornelas, Lawrence Luong, Jeff Makholm, Delia Patterson, Mary Ann Ralls, Commissioner Ann Rendahl, Aaron Tinjum<sup>\*</sup>

## PANEL DISCUSSION

**MR. REITER:** Welcome everybody, both people who are here in person and those online and to our superb panel of experts who are going to be talking today about data centers, an issue that's top of mind for sure. I did want to tell you a little bit about why the Energy Law Journal is doing this program.

<sup>\*</sup> Kat Gamache is the Executive Editor of the Energy Law Journal and a Partner at Norton Rose Fulbright LLP. Ronnie Bailey is the Senior Strategic Advisor at Dominion Energy; Mason Emnett is Sr. VP, Public Policy at Constellation; Karen Khamou Ornelas is the Director of State Infrastructure at Pacific Gas and Electric Company; Lawrence Luong is the Federal Affairs Manager at SMUD; Dr. Jeff Makholm is Sr. Managing Director of NERA Consulting; Delia Patterson is the Senior Director, Regulatory Policy and Compliance at the Salt River Project; Mary Ann Ralls is the Senior Director, Regulatory Counsel at NRECA; Commissioner Rendahl is a Commissioner of the Washington Utilities and Transportation Commission and First VP of NARUC; Aaron Tinjum is the Vice President, Energy at the Data Center Coalition.

From time to time, we've had topics that are of particularly current interest and writing a law review article takes a while. It's a little easier to assemble a panel of experts to talk about current issues, which is what we hope to do today, and which we've done several other times.

For example, a couple of years ago at the start of the war in Ukraine we had a panel talking about the tension between the concerns about making sure that Europeans had enough energy to survive their dependence on Russian oil and gas and the competing concern about climate change that would result from the export of LNG.

We also had a panel a couple of years ago talking about the need for utilities to engage in resilience planning and how they would accomplish that in the face of climate risks. After the storm that created massive blackouts of energy and electricity in Texas, we also assembled a panel. And what we did was we transcribed those programs and we published them in the journal.

So, today's program will be transcribed and those who weren't able to attend will be able to read what our experts have had to say in the May edition of the journal. I wanted to also thank the people who helped organize this, both our board of directors and our peer review editors. A shout out to Delia Patterson, who is on the board and an editor and a panelist today; Dave Connolly who helped organize this; and Flossie Davis, who is also on our board.

I also wanted to thank Brad Ramsey, the General Counsel of NARUC and Marvin Griff, one of our peer review editors. And of course, our administrative editor Nick Cicale, and our executive editor, who is also going be moderating today, Kat Gamache and to her firm, Norton Rose Fulbright, for hosting the event. And last, I really want to thank the EBA and Jack Hannah, the EBA's CEO. And our thanks to the EBA's Olivia Dwelley, who has coordinated this event. We couldn't do any of this work without their help.

So with that, I'm going to turn it over to Kat.

**MS. GAMACHE:** Thanks, Harvey. This is Kat Gamache, Executive Editor of the Energy Law Journal, and I'm also a partner in the projects group at NRF.

My interest in data centers is driven by the fact that practically every day either owners of generating facilities or developers or owners of data centers are giving me a call to discuss data center issues. And when multiple clients start calling about the same issue, I know that it's really hot. And we're also seeing it in the trade press all over the place, both in our industry trade press and in just the general national headlines.

For some stats: DOE released a report at the end of last December stating that data centers consumed about 4.4% of the total US electricity in 2023.<sup>1</sup> But they are expected to double that, or as much as quadruple that, and be 12% of the total US electricity consumption by 2028. Grid Strategies also released a report at the end of December that forecasted that load would increase fivefold over the next

<sup>1.</sup> Arman Shehabi et al., 2024 United States Data Center Energy Usage Report, LBNL-2001637, BERKELEY LAB: ENERGY ANALYSIS & ENV'T IMPACTS DIV. (Dec. 2024), https://eta-publica-tions.lbl.gov/sites/default/files/2024-12/lbnl-2024-united-states-data-center-energy-usage-report.pdf.

two years, and that data centers comprise the single largest component of growth in utility load forecasts.<sup>2</sup>

We have a great collection of experts to discuss what this unexpected singlesector growth means for our industry. I'm going to ask everybody to introduce themselves and also just their companies so that we understand the perspective that you're coming from. Jeff, if you want to start?

**DR. MAKHOLM:** Good morning. My name is Jeff Makholm. I normally work out of Boston. I'm the senior partner at NERA — not a title, just a fact. And I've been dealing with federal energy regulations since Harvey Reiter and I were young. So it's nice to be here today with the group.

**MS. RALLS:** Good morning. I'm Mary Ann Ralls with NRECA. NRECA is the trade association for the Rural Electric Cooperatives.

**MS. GAMACHE:** Thank you. And let's jump online and start with Ronnie.

**MR. BAILEY:** Yes. Good afternoon. I'm Ronnie Bailey. I work for Dominion Energy located in Richmond, Virginia. I've been with the company for over 44 years with the last 25 being focused on electric transmission planning and dealing directly with the data centers. So welcome and look forward to the discussion today.

**MR. EMNETT:** Good afternoon. Or morning, depending on where you are. I'm Mason Emnett with Constellation Energy. We are a large generator of predominantly carbon free energy, but we have everything in our portfolio. Our largest source is nuclear, but we have hydro, wind, solar, gas — you name it. And we're also a very large competitive retailer.

We operate in restructured states in which customers, be they residential or commercial and industrial, get to choose their source of power. We compete to provide that commodity service directly to the customers, and so obviously data centers, you know, are a potential source of customer growth for us.

**MS. ORNELAS:** I'm Karen Khamou Ornelas. I'm the director of the South Bay Large Load PMO for Pacific Gas and Electric Company here in Oakland, California. And we're a dual utility with gas and electric and serve the Central Valley, central California and northern California. And we're seeing a large growth in data centers.

## MS. GAMACHE: Thank you. Larry?

**MR. LUONG:** Hi, Larry Luong. I lead federal affairs for the Sacramento Municipal Utility District. We are a municipal utility located in northern California in the capital city of Sacramento. We serve about 1.5 million people in the

<sup>2.</sup> John D. Wilson et al., *Strategic Industries Surging: Driving US Power Demand*, GRID STRATEGIES (Dec. 2024), https://gridstrategiesllc.com/wp-content/uploads/National-Load-Growth-Report-2024.pdf.

capital region. And we're surrounded by our neighboring IOU PG&E which is Karen's company.

## MS. GAMACHE: All right. Delia?

**MS. PATTERSON:** Good afternoon everyone. My name is Delia Patterson and I'm the Senior Director of Regulatory Affairs and Compliance here at Salt River Project. And we serve about two million people, water and power in the Central Arizona area including Phoenix.

MS. GAMACHE: All right. Let's move back up north to Ann.

**MS. RENDAHL:** Hello, everyone. I'm Ann Rendahl, a commissioner at the Washington State Utilities and Transportation Commission, not Washington DC, and I'm also the first Vice President of the National Association of Regulatory Utility Commissioners. So I'm here wearing two hats.

In Washington, we regulate three vertically integrated electric and four vertically integrated gas companies. And NARUC, as you know, has members in all 50 states, Washington DC, as well as territories. And because of that, we have a lot of different perspectives on this topic. Some areas are seeing more growth and some are seeing less. So, I'm happy to talk about that more later.

MS. GAMACHE: Great. And then last but not least, Aaron.

**MR. TINJUM:** Yes. Good afternoon, everyone. Aaron Tinjum, I am the Vice President of Energy for the Data Center Coalition. DCC, if you're not aware, is the membership association for the US data center industry. And we represent currently 34 leading data center owners and operators with infrastructure across the country, as well as companies that lease large amounts of data center capacity. But good to be here today and look forward to the discussion.

**MS. GAMACHE:** Awesome. Thank you all for being here. As you can see, we have an amazing panel. And so I want to start just by setting the landscape. As I said, we're hearing a lot about data centers in the news, and I'm wondering, is this just hype? Or is it actually what you're seeing? I'm going to direct our first question to the utilities, to SRP, SMUD, NRECA — to the extent your members have kind of a consistency that you can speak to — and Ann as well.

Do you think that this is hype? Are you seeing a lot of data centers? Are you expecting to get a lot more? And I'm going to start with Ronnie because just yesterday the Wall Street Journal said that Virginia is the "data capital of the US and possibly the world."<sup>3</sup> Do you agree?

**MR. BAILEY:** Well, from my perspective, I believe that's very true just based on what we're experiencing. Yeah, in particular, the eastern Loudoun area

<sup>3.</sup> Jennifer Hiller, *Five Things to Know About AI's Thirst for Energy*, WALL ST. J. (Feb. 1, 2025), https://www.wsj.com/tech/ai/ai-energy-electricity-use-what-to-know-8c9e64b7.

around the Dulles airport has been very heavy in growth and is considered the data center capital of the world. This area is only 30 square miles. And yes, we are seeing tremendous growth. From our entire service territory, in the last three years have received on average — 75 new load requests each year mostly from data centers all connecting to the transmission system. And these are coming from our distribution, retail service territory, as well as co-ops that the Dominion transmission zone serves.

And from a total system load growth perspective, this growth has been getting validated over the last few years. For years we would go for years without setting a new system peak. But today we are currently on this high growth projection, and over the last three years, we've set a new summer and winter peak every year and sometimes multiple peaks within those seasons.

So, it is definitely something that is significant. So the data center capital of the world designation for eastern Loudoun is real. And that growth continues, but what we are seeing is a trend taking place where data centers are now migrating down the I-95 corridor to Richmond.

**MS. GAMACHE:** Cool. Let's jump to the other coast, and our other utility. Karen, is that your experience as well or is it a bit more muted on the west coast?

**MS. ORNELAS:** We're now starting to see a lot of requests for connection on transmission as well. As of today, we've had a lot of data centers connect on distribution, but most of the new demand is coming to transmission. Right now, we have applications for 5.5 gigawatts that we're assessing, about 1.4 gigawatts are moving forward and almost all are wanting to connect to transmission.

So what we've done to try and speed up interconnection is introduce a transmission retail tariff rules of engagement. We don't have a transmission tariff like most utilities because most customers interconnect on distribution. So, if we had a transmission request, what we would do is use distribution rules, modify them, and ask the California Public Utilities Commission to approve any variance. That takes up a lot of time.

So, as I mentioned, what we've done is actually file a transmission tariff that would allow for retail interconnection to the transmission grid. This is not just for data centers, this is for anybody wanting to connect at retail to the transmission grid.

Also, we're seeing not only increases in data center load requests, but also electric vehicles and building electrification. In California, a lot of cities are passing ordinances where they're saying they don't want gas for heating or cooking and they want an electric only building for new construction. So we are seeing load growth in that area as well.

**MS. GAMACHE:** And is there a capacity difference between distribution and transmission or are there other factors?

**MS. ORNELAS:** Yes, that's the main reason. Our distribution is at 21 kV, so we can usually serve up to 20 megawatts on distribution, but anything larger than that would want to connect on transmission.

**MS. GAMACHE:** Larry, is PG&E getting more of the excitement than SMUD or are you seeing this as well?

**MR. LUONG:** We do serve several smaller data centers in our service territory. We've been seeing moderate growth. I wouldn't say that it is gone at the same clip as what Ronnie or Karen have been experiencing, but we do hear many inquiries into setting up data centers in our area.

Our main challenge has been being able to site and be able to build infrastructure to facilitate our data center customers' needs and meet those needs. Our largest data center in SMUD's service territory has a 52-megawatt capacity, but they currently only utilize about 34 of those megawatts.

We have data centers as small as one megawatt facilities. And so we have a range of sizes, but they're all under the 100 megawatt size facilities, which is what we're hearing is popping up across the country in regions like Virginia.

Again, the challenges have really been trying to build out the infrastructure and who pays for those costs in our service territory. We're very careful about building out this infrastructure in part because there's so much uncertainty as to whether the customers will continue, these large load data centers will be there to pay off the cost of the infrastructure.

**MS. GAMACHE:** Yeah, definitely. Great thoughts there, and we'll dig into that a little bit. I guess Ann or Mary Ann or Delia, do you have anything to add or is your experience kind of generally the same?

**MS. RALLS:** I can certainly talk to the co-ops and given the fact that we've got about 900 members, this is going to be the first answer that I give that begins with it depends. Because there is, you asked if there was one specific, you know, level in terms of projected data centers. The answer's no. We've got members in the corridor in Virginia, in Loudoun, and in Fauquier County, and I know that Ronnie's very aware of it.

NOVEC [Northern Virginia Electric Cooperative], which is a distribution co-op there, they started 15 years ago with a data center, and in 2023, 65% of their load was data center. At the rate things are going — and this is in an area where land is not available anymore, the market is saturated — they are projecting that by 2033, 99% of their load may be data centers.

On the other hand, we have some co-ops in some of the Midwestern states that are just starting out. So we really kind of run the gamut, both in terms of size but also in terms of where the projects are located and what their needs are. So it depends.

**MS. GAMACHE:** That's fair enough. That's good insight. And what would you like to add, Ann?

**MS. RENDAHL:** In Washington, in particular in the investor-owned service territories, there's some interest in data centers, but nothing really significant, but there is significant growth due to electrification, industrial growth, and that's more gradual. As with PG&E, that's what we're seeing in Washington, for the investor-

owned utilities. But the consumer-owned service territories in Washington and Oregon are the ones experiencing more intense growth.

In particular, the Columbia River Utilities and in Oregon Umatilla Electric Cooperative but also Portland General Electric in Portland. In the west, I would say generally Wyoming, Utah, and Arizona are seeing a high interest in data centers. But even with that, our new governor, Governor Ferguson, has established a data center working group that'll include a representative from our commission just to ensure we remain a leader in the technology and sustainability areas and focus on growth, tax revenues, energy constraints, and sustainability.

As to NARUC — in fact, our meeting starts on Sunday of this coming week, and there is a demand round table that's happening on Sunday afternoon at the NARUC meeting to address these issues from all the states.

**MS. PATTERSON:** And Kat, if I can jump in as well, just to share our perspective from the desert Southwest. We are expecting the need to double and if not triple our capacity to serve the growing demand that in our area, yes. triple over the next 10 years.

It's not just the data centers — hyperscale and co-locators together, but also manufacturing that to this area and the continued residential growth is compounding the problem. With respect to data centers that are in the queue, last time I checked was a couple weeks ago, we have 21 data centers that are less than 150 megawatts.

That accounts for about 1,500 megawatts, and then 37 that are 150 and above that are in the queue. And that's just about 14,000 megawatts now. Just for some perspective, at SRP, we peaked at 8,219 megawatts for summer peaking unit utility in 2024.

So we peaked at 8,219 on August 4th. And, you know, when we think about just the data center flows of close to 16,000 megawatts that are in the queue, it's a lot. And if only half of that materializes, that's still a lot.

**MS. GAMACHE:** Wow. Interesting. Thank you. Let's bring Aaron into this conversation. Aaron, do the forecasts and what you're hearing from the utilities and the load serving entities and regulators track with what you're seeing and what your members are planning? Do they have big plans? Are they going to move forward here in a big way?

**MR. TINJUM:** Yes, it is a great and important question, and wherever we go, whoever we engage with, we get some flavor of the question. You know, is it real? Is this actually happening? I think to boil it down, it really depends on the forecast and how the forecast is being built. But I think more important than that, we're coming at this question today from an energy perspective, but it's important to take a step back and consider what has driven data center growth in the US to date.

There is unprecedented demand, from the perspective of our members, for digital services that have become central to our daily lives and modern economy. If you think about it, we're convening this hybrid panel today utilizing data center infrastructure. You may be ordering groceries online, you may be conducting online banking, making stock trades online, coming out of the pandemic, folks are accessing medical care through telehealth, medical records are being stored to ensure timely patient quality care.

And on average now, Deloitte has found that US households have 21 connected devices within their homes. How many of us are considering our own digital footprint? How many of us are tracking data consumption in the same way we track our utility bills and electricity consumption? How many of us have taken the time to count the number of connected devices within our homes?

I consider the number of devices in my own home that are generating and collecting data. We have multiple computers, multiple smartphones, smart watches, smart thermostats, multiple streaming devices, a video doorbell, smart lighting, smart smoke detectors, a security camera, and a smart sprinkler system to save water.

All of those devices are generating and consuming more data than ever before. And so even if we take artificial intelligence and set it aside for just a moment, which I know is difficult to do, we are in the midst of a tremendous shift to cloud-based infrastructure that has only taken off since the pandemic and has changed the way we work and stay connected.

There is data indicating that average monthly household broadband consumption doubled between 2018 and 2023 from 300 gigabytes to 600 gigabytes. We're now aware that 95% of Fortune 500 companies, products and services heavily rely on cloud-based technologies. And JLL, which is an important real estate firm that tracks data center development, finds that in the next five years, consumers and businesses are going to generate twice as much data as has been created in the past 10 years.

So, we are effectively going to generate double the data in half the time across the US economy. And I think when you take the step back and have that as a levelset, we can better understand the data center development and growth we've seen to date and better understand how that's connected to everything we're doing across our economy.

When it comes to forecasting, more specifically, we've moved from more or less a two-decade period of relatively flat electricity demand growth and are now pivoting to an era of load growth. And I do appreciate that some of the panelists have indicated wherever they're located, it's not necessarily just data centers now or data centers in the future.

Our industry is driving growth. We fully recognize and are aware of that, but we're also aware of onshoring (or reshoring) of manufacturing facilities in a number of key data center markets. We are aware that electrification of transportation, of buildings, of industry will also be a driver of load growth.

And while our industry might be the first ship to the shores in terms of actually showing up as load growth, we do not anticipate we will be the only load growth driver in this country in the future. And so we are leaning in as an industry. I'm happy to be part of this conversation today. And part of that is in the spirit of identifying new ways of collaboration for our industry to be helpful — in engaging utilities, engaging regulators and other important key stakeholders, recognizing that forecasting is difficult.

It will always be imprecise to some degree, but can we develop scenarios? Can we add data information that would help supplement forecasting exercises to ensure that we're right — sizing infrastructure in the country to avoid any stranded infrastructure or oversized investments.

But as our industry has experienced in a number of key markets, we've also experienced the impacts of under-forecasting and have facilities that are sitting idle, under construction, and whose powering timelines have changed, which results in capital tied up in important data center projects that need to meet the unprecedented digital demand that I mentioned earlier. But again, it's an important question and one we're leaning in across the country to be helpful.

**MS. GAMACHE:** Great. Thank you. So you kind of mentioned this, and you've mentioned it in the past, that we — we being me — I think of data centers as somewhat all being equal and they're actually very different.

Larry mentioned that he has a data center as small as one megawatt, which I found surprising just given my experience. You mentioned there's cloud computing, there's AI data centers. Could you give us a little tutorial on what the different types of data centers are and if there's any clear distinction in their energy needs or their flexibility?

**MR. TINJUM:** Like any industry, the data center industry is not a monolithic one. There are different companies, there are different missions, there are different operations and different business models.

And so while we've talked about data centers in our national conversation very generally and broadly, there are some important differences. You may have heard of "hyperscale" data center companies. That's often been used to refer to those facilities that are generally a hundred megawatts or larger. And we've often affiliated that term with the very largest technology companies in this country.

One thing I would note though, is that there is another business model. So you have the hyperscalers — let's call them "self-perform" or "enterprise" companies — that are building data centers to support their own operations and their own product and services. The vast majority of our membership at the Data Center Coalition are multi-tenant/build-to-suit companies. They are constructing data centers for one or more tenant.

So you may have a build-to-suit facility that's supporting a large Fortune 500 company that needs data processing nearby to support their operations. Or you could have a facility that is leasing to over 150 different tenants which results in different types of server infrastructure within those facilities as well. Those two business models, the enterprise and the multi-tenant/build-to-suit model, are important from a grid energy perspective.

For the enterprise companies, they're paying their energy bill, since it's for their own operations. For the multi-tenant/build-to-suit companies, that's generally a pass-through cost to their end use customers. And generally, the multitenant/build-to-suit companies do not have control over that server infrastructure within the facility because they're leasing the space as you would lease any commercial real estate. You're not controlling necessarily what the tenant is doing with that technology.

We often get questions around flexibility. Can you curtail this facility? Can it participate in demand response? Well, if there are multiple tenants that are renting that facility and the owner does not necessarily have control over the server

infrastructure, it's very difficult to design a program that could facilitate that type of flexibility.

And then very quickly I would just note that our membership does not include any members that are conducting cryptocurrency mining or staking as a primary business operation. That's another flavor of another business model that has demonstrated different types of flexibility. And so it's important to understand that while we're talking about computing load, there are some important nuances and differences, especially from a grid perspective.

**MS. GAMACHE:** Thank you. Jeff, I'm going to put you on the spot a little bit. Just a couple weeks ago, there was a big disruption in the industry when the Chinese company DeepSeek announced that it has an AI that was both cheaper and faster, which means it uses much less energy than we expected.

Then several US companies came out and banned the use of it. So there's a little bit of whiplash here, but I think that there's a really interesting economic impact in thinking about how something like one incident like that could really disrupt the market. And so I'm really interested in your perspective as an economist.

**DR. MAKHOLM:** Thank you. Kat. It should be manifestly clear, given that episode, that data center investment opportunities and risks do not fit well into the "administrative constructs" (the term used by the current FERC Chair Mark Christie) developed to serve traditional electricity supplies and transmission loads. Regulated transmission planning and the allocation of widely socialized network costs are inimical to the reasonable entry conditions that Data Centers wish to face. The whole architecture of federal rate regulation associated with the 1935 Federal Power Act never anticipated, and cannot reasonably handle *in its current form*, an industry of such speed, huge investment interest and risk.

That \$600 billion in NVIDIA share value can vanish in one trading day is sufficient proof of that proposition. The stable and slow — but to be sure supremely reliable — public interest elements of what NARUC calls "US regulatory common law" (a national treasure for us that we should not undercut) just aren't adequate for Data Centers. Those investors will find a way around — to bear both the rewards and risk of devoting so much sunk cost equity infrastructure to such a risky business.

**MS. GAMACHE:** Mason, I'm going to kind of put you in the hot seat in light of that. *Utility Dive* reported the other day that Constellation's CEO said the company's "foot is on the accelerator" to close data center deals.<sup>4</sup> What does that mean?

**MR. EMNETT:** I think the simplest way to say it is that we're trying to meet our customers' needs, and this is an area of growing customer demand. Like I

<sup>4.</sup> Brian Martucci, *FERC's AWS, Talen Energy ruling 'not the final word' on nuclear, data center colocation: Constellation CEO*, UTIL. DIVE (Nov. 5, 2024), https://www.utilitydive.com/news/ferc-amazon-talenenergy-ruling-nuclear-data-center-colocation-constellation/732016/ (quoting Constellation's CEO, Joe Dominguez).

mentioned before, we operate in the restructured market. They are the ones where the large customers are going and seeking their electricity, and they're going to get delivery service from the utility to the extent that they're connecting to the grid.

This is the market structure in which we operate. We are incented to sell our power and there's a growing source of demand. So of course we're going to work with the customers to try and meet that demand. That does raise lots of questions and challenges, whether it's specific to an individual project or it's these broader questions of how much demand are we really facing.

Demand projections from ERCOT were just updated, and there's a whole range of scenarios. And it depends, as we've already — as people have already talked about — what goes into your forecast of demand depends on the level of certainty that you have around particular projects and how you evaluate that over time.

But I think it was Delia who said that if you only have half of it, you still have a lot. And I think that's right, and maybe that's a little bit of what Jeff's pointing out. We are in an era of growing demand. As Aaron said, it's been some time. For a good decade, we haven't had demand growth, certainly not the way that we're seeing it now. And so it is a challenge for all of us in this ecosystem to collaborate, work together, and meet that challenge.

Not meeting it, as Aaron said, is really not a possibility, right? It's not the way that the utility system should be designed, and it should not be our shared goal to not meet demand. But that doesn't mean that it's going to be easy. We need to be realistic and do a lot of work on your threshold question. Is this hype? How much of it is real? A lot of work is going in across all of the regions on how to enhance planning to answer those questions.

I can say from our particular perspective, we get inbound requests from the same customer for multiple sites, and they are talking to other suppliers be it in the restructured markets or in other states that are vertically integrated.

And so it's very difficult to identify with precision what the actual demand growth is because these companies are not only of national scale, but international scale, and they are looking to meet their demands and they will go to the place where there is power and deliverability in order to manage those needs. We look to rise to that challenge, and I think that's what our CEO was saying: our foot is on the pedal to be a part of the solution.

We understand that we are only part of it, and that there's a broader conversation that needs to be had about how we're going to meet this domain collectively.

**MS. GAMACHE:** All right. That was actually a great segue. Thank you for digging in a little bit more to some of the challenges and . . . philosophy, I guess. You said you're getting a lot of requests and it's kind of the utility model that we're used to in the US that you have a request and it's fulfilled and the utilities are fulfilling it, or the load serving entities are fulfilling it.

And given all the challenges — like Delia's statement that the queue is full of way more capacity than she's ever seen — I'm wondering what are your thoughts about whether there really is a duty to serve these loads and whether there's a limit to what really can be expected of you-all? And I'm going to direct this one to the load serving entities and Ann as a regulator — how do you feel about this question? Delia, do you want to start?

**MS. PATTERSON:** I would love to start, and I do truly believe that we have a duty to serve and like Mason, we want to serve them. I mean, we're in the business of selling power, right? But there are a lot of obstacles.

So, we're definitely not shying away from the increased demand. But we do realize that there are challenges, and this is not just Salt River Project down here, you know — Tucson Electric and APS, they're all in the same boat, and we talk together frequently of how to serve this increasing demand.

I would say that that collectively as an industry supply chain is a huge problem. And I think our customers recognize that we're doing all that we can. And we've said to our customers: if you can get, you know, transformers, a substation or anything faster than we can, please bring it to the table.

Of course, there's the permitting, siting, transmission; we all recognize it's a problem. And so while there are projects in the queue, you know, we're limited; at least as a public power utility, to building to the load. We can't just, you know, build it and they will come.

We're worried about cost shifting on residential customers. And so ensuring that these large loads can stand behind their estimates of what they're going to need is important. But we have a lot of challenges that we could be working together on trying to solve and would love Aaron's group's help in terms of solving this more global supply chain problem that we're all facing.

**MS. GAMACHE:** Larry, does that track what you're experiencing in Sacramento, as well?

**MR. LUONG:** Yeah, I would say so. And for us, like all other public power utilities we — our entire mission is to keep the lights on 24/7. Now, there are certain times when that just can't happen such as the extreme weather events that are happening more often and our customers understand that, trying to ensure the power stays on for a data center is even more critical for their mission because they have extremely sensitive equipment that relies on that power 24/7.

And so for us we are taking it from the standpoint of, depends on the scope of the data center as to whether we are able to serve that load as close to a real time 24/7 as we can. So when I mentioned the 50 megawatt capacity data center, that is within the reasonable realm of serving them using our 69 kV sub transmission system which we have been doing. But if a 100 megawatt system were to try to site within our service territory, that would create a gray area for us because we don't currently have that capacity set up yet. And we would — we just don't know how — what the reliability would be like on a year round basis to serve a dedicated load of that magnitude within our service territory.

And so it really depends on size. The smaller ones, of course, we've been serving those customers reliably all year round, no issues. But as I think Mason and others have alluded to data centers, are not confined anymore or they're not a regular commercial load, they have boundaries that extend beyond our service territory. For example, as AI introduces more capabilities to load shift, one of the things that our distribution operators are worried about is the potential rapid load shifting between service territories for companies that have data centers in our area, that move that load in minutes to outside and back into our service territory and what that could mean for our ability to maintain stability of our portion of the grid. And so that duty to serve is very much contingent right now on the size of the data center that is working to site in our area.

**MS. GAMACHE:** That's really interesting. I hadn't thought about that. So essentially, the data center would be arbitraging potentially the price outside of your region versus in your region.

## MR. LUONG: Yes.

**MS. GAMACHE:** Interesting. Mary Ann, do you have any thoughts about this from the cooperative perspective? Do the cooperatives have more flexibility maybe in entertaining these requests?

**MS. RALLS:** Okay. So a little bit of co-op 101. Most of the co-ops are self-regulated. They're regulated by boards, but a fair amount of them are also state regulated. So they must comply with whatever the state public utility commission's duty to serve is. So again, it depends, you know you've met one co-op, you've met one co-op.

In terms of how overall the co-ops approach it, I'd like to say that we were the first ones that coined the phrase, "Providing affordable, reliable, and safe service." I wish that we had trademarked that because I think that we would've made some money on it. And I don't know if I'd be here right now, I'd maybe be in Italy.

But I agree with everything that Delia and Larry have said in terms of the factors that go into the decision in terms of what the duty to serve is. We cannot discriminate within a class of customers. We have to — and we want to — provide the same service with the same terms and conditions.

Now having said that, obviously as Larry and Delia have said, the requests coming from data centers, it's not that they're unreasonable and it certainly is that the co-ops do want to serve them, but given the data centers — given the specifics of the project, there are a lot of different factors that we need to take into account in terms of what sort of timeframe, what sort of contracts and everything that we can offer.

That is just making sure that the data center understands upfront, as well as the developers, what it is that we need to serve them, and also maintain safe, affordable, and reliable service that we're providing to what you might want to call our native load.

**MS. GAMACHE:** Thank you. So Ann, Mary Ann mentioned that the states have a lot of say over these issues. Is this something that Washington has a perspective on? And you mentioned that there are some policy debates going on. What is the state's obligation — or the load serving entities within the state's obligation — to serve these data center loads?

**MS. RENDAHL:** So I'm going to speak a bit to Washington, but also just generally given my role at NARUC, about what we're seeing. Most states have language in statutory provisions related to the obligation to serve customers, which requires utilities to provide non-discriminatory service to all customers in their service territories, which Mary Ann talked about in terms of not discriminating within a customer class, but this — you know, I think as everyone has said, there are some limitations here.

Whether you consider it as a reasonableness test or not, it's really part of considering the cost of serving the customers. So I would say that this really turns on the question of what is non-discriminatory service. There are multiple different customer types.

There's residential, commercial, industrial, and agricultural customers, and each one of these customer types and classes imposes different costs on utilities' provision of service and different locations, their demand profiles, and the predictability of their needs. And so rates have to reflect those different costs.

We're seeing this issue, I think in particular, play out in Ohio. You know, one of the concerns here, and it's been alluded to, is that you would be obligated to serve a customer paying a certain amount for the energy, and either then they demand more or they demand less. And if they demand less, then what sort of stranded costs might unfairly fall and shift costs to other customers if that load doesn't materialize?

So, in Ohio, you've got the Ohio Power Company in a case currently before the PUC in Ohio,<sup>5</sup> and then there's the Basin Electric case at FERC.<sup>6</sup> And these issues are still in play determining what the obligation to serve means and what does non-discriminatory mean. Somebody mentioned the cryptocurrency miners, the Chelan Public Utility District in Washington created cost-based rates for cryptocurrency miners who were flocking to that service territory and creating additional costs.

So, as I said, I think these are – these issues are going to play out within state commissions. They're going to play out at FERC. But, the issues of overbuilding and stranded costs are real. And in the Northwest, those of you who might remember, a group of public consumer utilities thought that there was going to be a lot of demand growth, and they engaged in the Washington Public Power Supply System effort or WPPSS. And they built a lot of generation — started to build a lot of nuclear generation.

This was in the 70s and 80s, and then there was the largest public municipal bond failure in history. And we're still paying for that. So there's a long memory of this stranded cost. So while I do believe a lot of this new growth is real, as Delia said, even half of it is a lot, but we have to protect other consumers from not having to bear the cost of this development by the utility to meet a customer that may not show up or may not show up as much.

<sup>5.</sup> See Docket, *In re* Application of Ohio Power Co. for Tariff Approval, Pub. Utils. Comm'n No. 24-0508-EL-ATA (Ohio P.U.C. May 13, 2024), https://dis.puc.state.oh.us/CaseRecord.aspx?Caseno=24-0508&link=DI.

<sup>6.</sup> Basin Electric Power Cooperative, 188 FERC ¶ 61,132 (2024).

And really protecting the customers is our role as regulating the public interest and making sure that all customers are really paying their fair share for the cost the utility has to bear to meet all of its customers. So I think I'll just leave it there.

**MR. EMNETT:** Could I jump in on that? On the fair share piece, I completely agree. What is fair is often in the eye of the beholder and becomes the difficult part of a lot of these conversations. I think the Ohio example is a great one to have in mind.

Across the border in Indiana, there's a similar tariff structure that has moved forward. We've been involved in both of those proceedings. In our experience, Indiana was a little bit more productive of a conversation because it was more collaborative going in. At least in our experience from what we saw in these proceedings, it works better when you bring everyone to the table — the customers, the providers, the utilities. Again, there is a different kind of regulatory structure in some of these states compared to vertically integrated states.

But in our experience, when you bring everyone together and put the needs and issues and challenges on the table, you can find solutions to move forward. Large customers like data centers, which are, you know, moving forward with projects that are now 3, 4, 500 megawatts — of a scale that did not exist in the past — there are new issues that need to be addressed.

A common thing, and Aaron can speak to this more directly, a common message that we hear is there isn't a desire to escape costs. There's a desire to figure out what is a fair and equitable allocation of costs and assumptions of responsibilities for investments over time. If you kind of come at it from that perspective, with everyone entering the conversation, we have found that you can find solutions.

There are other examples, like there was a mention of the various proceedings that we are involved in that have not been collaborative and it is taking a lot more time to get resolution on some matters that have been pending for a year without resolution. So that is one thing that I would just encourage all practitioners out there is try and start from a place of collaboration first because those conversations can often be very productive.

**MS. RENDAHL:** And with my comments, I wasn't advocating that everything has to be litigated, but just this is what we're seeing in those litigated cases. And I concur with you, Mason, that having the conversations and coming in in a collaborative way and sorting out: does there need to be a new customer class? And how do you resolve the common costs that would go across all customers? And what are the particular costs that the new customer needs to bear?

I think these are issues that state legislatures across the country are dealing with, that commissions are looking at. And so I agree being more collaborative is always better than going for litigation, although, you know, as a lawyer, that's our role.

**MS. PATTERSON:** Can I just add that, similar to the rate schedule we were talking about in Ohio and Indiana, SRP is in the middle of its rate case, if you will.

Our rates are governed by our board but we are subject to ACC [Arizonia Corporation Commission] jurisdiction for other matters, including transmission siting and the like.

But we proposed a similar rate schedule and we all should know by next Thursday, knock on wood, if on the "pricing process," which is what we call it, if it concludes by February 27th, then we should know if that rate schedule has been approved by our board.

We're watching what's going on in other parts of the country and learning from Dominion for a very long time, Ronnie and others. And so these conversations are important and I appreciate everyone's insights.

**MS. GAMACHE:** Is the rate schedule designed to capture both the cost of the new capacity and some of those risks, as well as the interconnection and build out of the grid?

**MS. PATTERSON:** The rate schedule is mainly with respect to the energy costs we already have. Like, for example, depending on the size of the load. So it's not just targeted at data centers.

Right now our processes in place is — if you're like up to 5.7 megawatts, it's standard service. If you're, you know, above 5.7 and up to 10, then it's enhanced service and you are still on the distribution level. And then of course, if you're over 150 megawatts and greater, like you're on the transmission system, you're responsible for the cost of the substation, of course interconnection and all of that. So we have that in place.

When you're forecasting your needs, you're going to be on the hook for 80% of that amount. It's like a take or pay. Like that's the new rate schedule that we're going to have for these larger loads to avoid the cost shift going forward if they don't show up. So that's the change that we're implementing. Appreciate that clarifying question, Kat.

**MS. GAMACHE:** And Karen, this sounds like something that you've been working on as well. Is that true?

**MS. ORNELAS:** Yes. Costs are top of mind for us. We've done a couple of things to address this. I think folks are familiar with how the California Independent System Operator runs a cluster process where generators submit their applications during a window of time, they are studied, and then the engineering costs can be shared. We have developed something similar for load requests.

This past year we ran a cluster process for retail load interconnections, and it was super effective. We were able to reduce costs because there was some cost sharing. For any switching station that may need to get built or substation that needs to be upgraded, if you do all the upgrades at once instead of doing a 115 kV upgrade one year and then expanding to 230 kV a year later, you save costs.

Earlier, I had mentioned that we filed Electric Rule 30 at the California Public Utilities Commission (retail transmission tariff). We wanted a balance between what the utility takes on and what anybody connecting to transmission takes on. So, we've said that anyone connecting to the transmission grid would take on the cost for interconnection facilities and pay for them upfront.

We would pay for the capacity upgrades. The customer would get paid back for the interconnection costs as they generate revenue over 10 years. For example, if you say you want 100 megawatts and you end up ever only using 20 megawatts, you are really not generating that much revenue, therefore you will not be paid back the full amount of the financial advances. Or if you decide to cancel the project, we would withhold the dollars that have already been spent. That was one way we're trying to balance costs to make sure that our general rate base or other customers are not having to foot the bill if these entities don't fully come online up to the capacity that they said. With respect to capacity costs, the reason we said we would take them on is because those upgrades benefit the entire system. And there's tons of precedence on this.

**MS. RALLS:** Can I piggyback onto this very briefly? Obviously what Delia said and what Karen was just saying, those are very important issues to us as well. We have members that are looking at a lot of the same constructs. We have a couple of things that are a little different, and this is mostly in terms of the energy cost — Ann mentioned Umatilla in Oregon. They have a green tariff with Amazon, and under that tariff, Amazon basically purchases the power.

Umatilla is the distribution co-op, and it handles everything else, but the costs are something that are completely separated by this tariff. And they're specific to Amazon. In a similar vein, Rappahannock Electric Co-op — which is in the ever-expanding data center corridor — they're regulated by the state. They are working with the state to set up a separate entity that will purchase power in the market for the data centers.

Again, that'll be specifically separate from their purchasing from their generation and transmission cooperative, ODEC. So there are a number of different ways that you can obviously, hopefully successfully, slice and dice this. When we get to capacity obstacles, there's some other comments to make. But thank you for letting me hijack.

**MS. GAMACHE:** No, absolutely. Ronnie, Delia mentioned that they're learning a lot from you about cost and risk allocation. What are you teaching her?

**MR. BAILEY:** Well, I mean first off, from the transmission perspective we serve Rappahannock cooperative and, it was just mentioned, NOVEC. There are a number of co-ops in our zone and all are starting to experience this growth. And of course we have our own retail service territory. Costs to data centers differ from Dominion retail to the various cooperatives. However, the transmission costs that we build are socialized across our entire transmission zone that is recovered by our FERC formula rate. We're part of PJM.

To connect to our transmission system, data center comes to us via our retail service provider or one of the cooperatives. And so all customers pay for the transmission piece. Now, when you get down to the either — whether it be the cooperative or the Dominion retail, there are other costs that are the distribution load costs that are done differently and so forth.

And I know we're looking at, you know, minimum demand charges and other things on the retail side on Dominion. And the NOVEC and the Rappahannock are doing other things as well. So it's a number of different cost mechanisms, whether it be the transmission-related costs or the distribution-related costs.

**MS. GAMACHE:** Thank you. Several of you have touched upon these non-by-passable charges. In my home state now, Texas, a lot of data center activity has been behind the meter in order to avoid some of these non-by-passable charges and to take advantage of a net metering system. But just last week, in the Texas legislature, a bill was introduced — it's Senate bill 6, and the assigned number means that it's probably going to have priority — to basically look at this and try to allocate some of those charges that the data centers have been avoiding to the data centers and other behind-the-meter load. I'm wondering: have these co-location issues have come up for anybody else, and if so, how does that play into cost allocation? Does anybody want to volunteer to take that?

**MR. EMNETT:** Well, I guess I should jump in because we're one of the most prominent voices on the co-location debate. So, again, Constellation Energy is an owner and operator of a fleet of nuclear plants. When you get very large data center projects looking for hundreds of megawatts of power that's highly reliable, that's carbon free — those are the reasons we get calls and inbound requests for potential projects. And so as we've been working with customers, this question of configuration has come up.

Some customers want to be grid connected, and we are serving those. We've got an example of bringing back on the Three Mile Island plant, relaunched as the Crane Clean Energy Center. We just had an announcement today that we are able to move forward some of the schedule of activity for bringing that plant online.

We're very excited about it. It's \$1.6 billion of investment that is made possible by a 20-year off-take agreement with Microsoft. Their sites will be located somewhere within PJM, and they'll be using the power that's delivered to the PJM grid in order to operate those sites. There are other customers that are interested in potentially co-locating and co-location in our mind has multiple configurations. It could be proximate to a nuclear plant, but still connected to the grid. So you're taking about a direct feed from the nuclear plant, but also having a grid connection for the backup power because the grid is very reliable, right? And so there should be charges associated with that. Should those charges be the same charges as any other grid connected customer, or should they be different? That gets into the fairness and equity questions that need to get resolved. And then an alternative configuration would be what we refer to as fully isolated. Some people refer to it as non-networked. I think that's maybe the net metering arrangement that you're referring to where a customer is located next to a generator. This is where a data center is connected to that generator and has no ability to pull power from the system because of special protection schemes and breaker systems. That has raised questions as to what the appropriate charges should be for a customer like that, that has no ability to use the grid. What, if any, charges for the grid should be paid is part of many proceedings that are pending before FERC that are actually on the open meeting agenda for tomorrow.

So we might get a little bit of clarity there. This non-by-passable charges component is one element of charges that would be applied to a customer if it were connecting to the grid. But just because you connect to the grid doesn't necessarily mean that you should pay the same non-by-passable charge as everyone else.

For example, in Maryland the contribution of large industrial customers to the state RPS is capped — it's a volumetric cap. There are different ratemaking approaches recognizing that different customers contribute in different ways to things like RPS LIHEAP programs, and other things that run through non-by-passable charges. That is a question for the state regulator as to how to design those charges. If you have a customer that is not touching the grid and is isolated behind a generator, it's a question for the state to figure out.

In some instances, we think that some of the states have jurisdiction to answer that question, and some of the states they don't and the legislature would need to take it up. But that's a question of equity for every user of electricity in the system. How should they be contributing to programs that other users of electricity are contributing to? Every state will figure that out on their own.

There was a hearing at the Maryland PSC on a lot of these related issues, and the question of non-by-passable charges came up. The representative from the Data Center Coalition that participated in that conference made clear that, from her perspective, the data center community wants to have a conversation about that. Again, they're not looking to avoid charges. They're trying to figure out what's an equitable allocation of charges depending on the configuration and the way that they're using the system or the broader set of electricity infrastructure. So it's something to figure out. These projects are bigger than we've ever seen, and the load is growing faster than we've ever seen. The fact that we have novel questions to figure out isn't too surprising, which takes me back to, well, then let's collaborate on an evaluation of the solutions. Maybe that's not going to be successful and we end up litigating it, and that's our job.

But let's start by talking through it because, at least in our experience, most of the folks that are coming to that table do want to get to a solution and have alternative views and pathways of getting there. When you're in an environment like that, you can often find your way through.

**DR. MAKHOLM:** Kat, something that Mason Emnett just said is important, and I wonder if I may also talk about the co-location issue if I could. Co-location, to me, is clearly designed to by-pass the kind of major interconnection problems and delays that are so obvious to the queue at the other end of the transmission system. As far as I can see, those wishing speedily to finance new data center infrastructures want nothing to do with that sort of traditional common cost allocation (of AC Transmission costs) associated with traditional loads and generating sources.

In another kind of hypothetical world for example, if the major US interstate transmission system were like the DC Pacific Intertie of contractualized, directional DC transmission lines (more efficient, smaller losses, smaller conductors and land use than AC systems) — Data Centers would not have to treat the transmission network as something to be avoided. They would pay for the kind of transmission service they wished and no more. But the great RTO areas were created to facilitate a different kind of transaction.

To me, the data centers clearly want no part of the half hour electricity markets. Such is particularly true for the great multi-state RTOs in the US Heartland, SPP, MISO, and PJM. And the evident capital market risk of data center investments is something that consumers and traditional sorts of business enterprises don't want to bear. Those renewable and storage projects in *The Queue* would give anything to co-locate. But alas, the windiest part of the lower 48 states is in Dodge City in Western Kansas — where nobody lives (my apologies to those who live there).

To me, co-location is by-pass, and what Mason is talking about is a very useful comment in that respect.

**MR. EMNETT:** Just in response — we don't view it as a by-pass. We see it as an alternative customer configuration. Frankly, if you look across the data center community now, they're all grid connected, right? I don't think there is a stampede to avoid charges. There's a desire to get connected. And in the states in which we operate, we have power that's available.

We aren't in vertically integrated states. If we have power available, it is on us to sell it. And if we have customers that are willing to purchase that power, then we work with them on their preferred configuration. There are benefits associated with co-location in terms of not burdening a transmission system that otherwise is trying to expand to meet load growth.

But then there are also questions around what's happening on the rest of the system. Questions like non-by-passable charges, things that you need to address. But again, in our experience, it hasn't been a desire to avoid charges — it's a desire to get projects online.

**MS. RENDAHL:** Kat, Just an example from Washington. In 2017, the commission approved a contract between Puget Sound Energy and Microsoft who wanted to find their own generation to make sure it was non-emitting. But they agreed to retain some of the charges to remain connected to the system in case they had issues getting the energy to serve their needs. And so they, like the example Mason gave, they committed to meet the RPS standards for this power that PSE would otherwise have taken on, and they also agreed to pay into the low income charges and retain some of their grid connected charges.

So again, working collaboratively, they were able to figure out an arrangement so the large customer could get what it wanted and also remain on the system to provide that benefit for all the other customers.

One of the things that the contract did do was the special contract made sure that Microsoft still remained responsible for the decommissioning and remediation charges for the Colstrip plant when that plant went offline because they were a long-time customer of Puget Sound Energy and bore the benefits of that power for a long time.

So I think Mason, we all agree, we want to try to collaborate on what is the right balance between the large customers getting the power that they need and the service that they need, but still ensuring that other customers are not harmed. And as a commissioner, that's my role to make sure that these arrangements are in the public interest for all the customers, and that no one is getting more benefit for shifting costs to other customer groups.

**MR. BAILEY:** Yeah. This is Ronnie, I was just going to ditto what you just said, Ann, in that, you know, Dominion is supportive of evaluating and looking into co-location of our generation.

Dominion is supportive as long as there are well thought out rules and to ensure that other customers that use the grid are not harmed, the transmission grid reliability is not diminished.

At the load level, requests that we're getting are well above a hundred megawatts. And in many cases, we're beginning to see campus size build outs where it's well over a gig. And we did just receive a request for seven gigs of data centers all in a small geographic area.

So co-location does have a potential role. I think we need to get very creative at serving all of this load, but also to ensure that all customers pay their fair share and that the reliability of the grid itself is not harmed in any way. Because the transmission system, no matter how that generation has been used to serve through co-location or not, the transmission grid is still going to be key to making everything work.

**MS. GAMACHE:** So Ann, that sounds like a pretty bespoke arrangement, and I'm wondering if anybody has thoughts on that because it seems a little bit inefficient to have to do these arrangements every single time. That said, given that these are such large loads, maybe that is the answer.

Does anybody want to comment on that whether this is going to be a caseby-case process, or is anybody coming up with broad solutions — or seeing broad solutions brought to them — that would work for multiple entities?

**MS. PATTERSON:** Kat, we're not being approached in that way with folks bringing their own generation to the table. You know, back in January of 2024, we instituted a buy-through program for large customers, up to 200 megawatts for them to bring their own generation to the table. And we've had no takers to date just because we were able to provide the cheapest power.

But I would say that in chatting with folks in economic development, we have had conversations with folks and we're, you know, willing to listen to new approaches. But there just haven't been any takers. And I'm not saying that is, you know, because we're so great, it's just — we just haven't seen that to be honest with you.

MS. GAMACHE: Interesting. Aaron, please.

**MR. TINJUM:** To add some perspective from the industry, I think it's already been touched on that there is unprecedented demand for data and digital services that our DCC members are working to meet. To meet that demand, speed to market has really become the driving force and factor for our members. How quickly can you get your facility up and running and powered?

The main barrier to that is access to clean, reliable power in a timely manner. Much has been written at this point about the mismatch between utility development cycles for new infrastructure versus how quickly you can get a data center up and running. I think, by and large, if you were to poll our members, the preference would be to work with the local utility, be connected to the grid as they have in the decade prior. But barring that, when you're encountering transmission constraints, when you're encountering powering timelines that have gone from two to four years, to four to seven, eight, nine years in some key data center markets, that's when you'll see a rational response of exploring more innovative and creative approaches to power generation. So a lot has been covered around the discussion of co-location. We participated in the FERC conference late last year around that discussion. And one point of emphasis was that co-location isn't a preference of our industry.

It's not even necessarily what we would view as the best approach in most instances. But we do think — if we soberly recognize the state of the grid, the constraints and the investments that need to be made, and we also acknowledge the demand that our members are seeing for data center services — co-located load arrangements should be permissible with some parameters that include rate payer protections so that a co-locating data center pays its full cost of service. There should also be grid impact assessments to answer what impact would this have on reliability or local infrastructure?

I think oftentimes our industry feels that co-located load arrangements are framed as a choice between serving the data center or ensuring reliability of the system. I think it's far more nuanced than that, and that we can walk and chew gum if we do things thoughtfully and ensure that solutions are very well thought through and collaborative.

Finally, just on the discussion around cost, I'll emphasize that our industry is committed to paying its full cost of service. We've been involved in some of the regulatory proceedings that were noted earlier. I think the concern that rises from our membership is when some of these proposals are developed in isolation, that the industry wasn't engaged, feedback was not taken or reflected in any manner, and that proposed rate structures or rate classes are defined by an industry rather than actual grid characteristics. That's a very important issue, in fact, for our members.

Beyond that, I think ensuring that there is transparency: are these proposals and requirements evidence-based? Is there a public analysis? Can we open the filing, turn into the page, and see how a minimum demand charge or capacity reservation charge is being calculated and ensure that those are indeed fair and equitable? And then finally there's also a collateral element that's been floated in a number of key data center markets.

At the federal level, we have heard from both the current administration and prior administration as well as members of Congress and DOE the importance of ensuring that from a national security perspective, that data center development occurs here in the US, both in terms of storing our data and also remaining competitive on the global stage with artificial intelligence development.

There are collateral proposals now that the vast majority of our members could not meet from a credit rating perspective or put up the amount of collateral that is being asked of them in key markets. Only the very largest of companies could potentially meet these requirements. I raise that just to emphasize that we need to be thoughtful and again, ensure that any requirements being proposed are truly evidence-based and truly needed, and that we all have an understanding of the impacts of such requirements. Of course, we should be protecting, especially, residential customers from any unnecessary costs. But we also need to ensure that we are supporting economic development and growth in this country in a thoughtful manner.

**MS. RALLS:** If I could sort of add to this, I want to address a couple things. First of all, Aaron mentioned transparency, and that is a huge issue for co-ops for a number of reasons. Probably the most important one is that co-ops are non-profit and we're lean machines.

So, to the extent that data centers come to us with a proposal we've found that it's in our best interest to be as upfront as possible about what the costs will be, both in terms of the infrastructure, but also in terms of the energy and what sort of timeframe you're looking at. I've heard anecdotally that some of the developers actually like that because it's not as if they, you know, start the process and then a couple years later something else comes up that's a larger cost.

The other point that I wanted to get to, and this gets back to something that Ann was focusing on in terms of the state regulations on co-located loads. We do have one member in Maryland, and Mason knows this, who is involved in the Calvert Cliffs project. Calvert Cliffs is in their service territory. Bringing everybody to the table is absolutely important. I'm not speaking specifically with respect to that case, but I do think that, at the rate that this entire industry is evolving, it is bringing out all of these other nuanced issues or components that have to be addressed.

So, if you've got a co-located load, well, what's the state's role in terms of that? You know, are you taking something — are you taking an energy source that was necessarily available to the local distribution utility? Don't know. Are there charges there at the state level that should be retained and should fall to the data centers? Yes. We've talked about that.

But again, this is something that, as this whole industry evolves, I think that all of these issues are coming out. You know, would it be easier for co-located load to develop their own load as we've mentioned from a regulatory perspective? Probably at least at the beginning, because you wouldn't have to address, well, the impacts of removing generation resources — even decommissioned ones — from a resource adequacy and a reliability standpoint and any costs associated with that impact.

So I'm not answering anything, I'm just saying that we just have to go forward and try to figure it out, that there's no one answer. We do have to be open to other ways of doing business. And I haven't had lunch.

**MR. EMNETT:** If I could just do a quick follow up on that — the generation piece. In the states in which we are operating, where decades ago the utility systems were restructured and the generators were told to rely on market revenues, and if your market revenues weren't sufficient, well then retire. And that's exactly what happened to 10% of the nuclear fleet.

Not all of those were in the restructured states, but challenges arose in the market and lowered revenues as we built out renewables — which are great and we need to be doing. But with low-cost gas and more renewables coming online, it created challenges for nuclear plants. This led to two-thirds of Constellation's

fleet operating under state programs that were enacted or implemented at the regulatory level to prevent retirement. Across our footprint, that's something like 15,000 megawatts of nuclear generation that would've been lost but for state action. So now we have customers that are coming to us interested in entering into long-term contracts that are going to enable us to continue operating, to relicense, to uprate, and potentially build new resources. From our perspective, of course we're interested in serving those customers. Our power is available. It has not been contracted by anyone in the market. That's why it is available for purchase.

We definitely do want to have conversations about the ways that markets should be responding to this demand — in the competitive market structures in which we operate. That is what is in our mind, not who has what right to what power. We think that is established in the regulatory structure. We are directed to go off and sell our power, and if we can't sell it and we don't have other revenues, then we should retire. That's the market structure in which we operate.

**MS. GAMACHE:** So I've heard that there are companies, developers, generation owners, such as Constellation, who are bringing solutions, and I've heard that some data centers are bringing solutions from Aaron and Ann, but then also from Aaron, hearing that there are some rules being made without really discussing with the industry whether they make sense. What's the solution?

Should people be — should the data centers and the generators be bringing proposals? Is that the most efficient solution, or is it more of a top-down approach? Is it all of the above? Is that — are we going to have to do this one-by-one? What are your thoughts?

**MS. RENDAHL:** So, I'll just say this, it's coming in many different ways. So we have state legislatures getting involved. You mentioned Texas, you know, that's a very top down policy. And while there is an ability to engage in those processes, it's a very political issue.

It's not people getting together usually to craft a collaborative solution where you have state commissions who could, if they're regulating these entities, obviously we don't regulate a lot of public power and we don't regulate consumer owned utilities and co-ops, at least in Washington.

So I think it takes that collaborative effort, and that's part of what NARUC is trying to do to bring everyone together at the demand round table to talk to the data centers, to bring the commissioners and educate everyone to really understand what the issues are, just as we're doing today, so that you can then go into these conversations not in polar positions and staking out your position, but trying to figure out how to get the best benefit.

And, you know, talking about Mason, just bringing back these nuclear plants or repurposing them where they might otherwise close, but all of the new nuclear that's being proposed and being invested in there. That, I think, is going to benefit customers generally — because at least in the West, I know we have a capacity shortfall.

We need this nuclear capacity, and it's not emitting, which is what a lot of the data center customers or high demand customers are wanting. So I don't think there's a cookie cutter approach here. I think, obviously, legislators are going to have an opinion, but we need to be able to work these things out so that you want to attract these businesses to your state, and you want to provide those services to them.

The utilities want to provide service to them, and the issue is really figuring out how you collaboratively determine those benefits and allocate them. So, I'll just leave it there.

**MS. GAMACHE:** So for the NARUC round table, will that include data center representatives and generator representatives as well?

**MS. RENDAHL:** I believe so. President Pridemore is directing this effort at NARUC, and there is a conversation starting on Sunday afternoon. I think it'll be a continuing conversation, really to educate and come up with some thoughts on how we move forward here.

## MS. GAMACHE: Will it be public?

**MS. RENDAHL:** I believe it is public. It's my understanding. But you have to register for NARUC.

**MR. TINJUM:** It can sound like a shallow platitude, but I think this era of load growth, given the challenges we're facing, does require new communication, collaboration, and transparency from all stakeholders. Greater communication and collaboration could be around things like forecasting.

We often hear how difficult it is to ascertain whether the load is real, how the forecast is being built. Simultaneously, I know our members would love to be helpful in identifying ways that our industry can help validate or contribute to the forecasting exercises to help avoid concerns around stranded costs for other customers and ensure we're building out the grid to the correct size and scope.

I don't think it will ever replace, of course, litigated and regulatory proceedings. There will always be some differences, but if we can identify best practices going into proceedings or opportunities for better understanding, I think we're willing participants in that endeavor.

I think the NARUC Demand Roundtable will be a great way to have that kind of open, transparent conversation. I believe it's seven commissioners, seven utilities or RTOs, and seven data center companies that will be participating on Sunday.

In other key markets, like Illinois, Governor Pritzker convened and initiated an informal Illinois data center energy task force in which we've been engaging with our members, along with Illinois' Utilities, PJM, and the Chicagoland Chamber of Commerce, to have a wide-ranging conversation around the challenges and opportunities within the state. And I think those types of venues and discussions just create greater understanding going into the more formal processes that we're all familiar with.

**MS. GAMACHE:** Sounds like you're going to be really busy, Aaron. You bring up a good point about forecasting, and that ties back to something Delia said earlier about another solution beyond rate making and cost allocation solutions.

You made the point about getting online quickly, Delia, I think you said that you had some proposals whereby people would actually bring some of the long lead items to you and say, you know, here you go. Can you please interconnect me quicker if I give you this equipment?

I'm wondering if there's anything else like that to address some of these issues like speed to the grid. Other issues I'm thinking of off the top: I've heard about noise complaints, which I don't know if that's valid at all, if anybody wants to speak to that, and just general nimbyism.

**MS. RALLS:** Well, I do want to piggyback on what Delia said about the facilities. We don't have a rule of thumb, but overall, you know, if you're talking about a hundred megawatts and above, which I think was sort of what we were shooting at. To the extent that the data centers the developers can commit to bringing their own substation, if they can find the supplies, obviously. That's going to shorten the time.

Generally speaking, I've talked to folks in the Midwest and that would shorten the time from, I want to say three to five years, down to two to three years. If the facility is behind the substation, then that would also shorten the time period. And these are sort of obvious points, but these are things that the co-ops are looking at.

However, the supply chain, as several of us have mentioned before, this is a real concern whether or not the data center's been — you know, developers can bring in the supplies or whether or not in our instance, the distribution co-ops or the G&Ts have them. So it's real conundrum. Thank you.

**MR. EMNETT:** We're seeing that same kind of conversation play out in our potential customer arrangements that we have, as a large generation fleet operator. We've got our commercial relationships with folks like transformer and substation equipment manufacturers. We also view that as an opportunity for grid-connected co-location.

Also, if you're going to site close to our facilities, nuclear plants tend to be far away from folks, so there's nobody to bother with noise. We tend to be very secure, we tend to have access to things like water, and we tend to have access to lots of equipment.

And there's a potential for collaboration with the utility to say, hey, we've got the land, we've got the equipment. We can help you bring this customer online to your system more quickly because it's a one-to-one project for us. We have this one project to manage. You've got dozens of projects across your entire distribution and transmission systems. So there is an opportunity for coordination there. Again, that's a grid connection, but the customer happens to be physically located at the place where we can bring equipment and land and expedited activity.

**MS. GAMACHE:** Is that something that the traditional utilities, like PG&E and Dominion, would be open to? I mean, do you have the flexibility to get equipment from interconnection customers?

**MR. BAILEY:** Well, I'll speak from a Dominion perspective. From a supply chain and equipment issue, we have certain standards that have been researched

and developed over many years of operating our system. We work very closely with our vendors, and they are all over the world, Europe, Japan, South Korea, and so forth. We maintain a high quality list of vendors and where possible have approved additional suppliers.

So I think from a supply chain, we don't see that as an issue with regards to impacting the timeliness of getting the facilities constructed. So, for us, that's really not an issue today in meeting timelines. Our issue is just the sheer volume of requests and the magnitude of infrastructure that must be constructed.

I think I mentioned earlier that we're getting each year now well over 70 individual requests for 70 new interconnections. And what we're seeing is each year the size of the requests are getting much larger. And pure system load is projected to double in the next 10 to 15 years all driven by data centers.

So for us, it isn't an equipment issue, but rather a volume of amount of transmission infrastructure and that needs to be put in place. And if you've followed PJM, setting aside the infrastructure just to connect the data center, over the last two years, they've approved over \$10 billion of grid enhancements that are really directly tied to this growth. And the majority of that \$10 billion is on the Dominion system.

So we have a number of infrastructure projects moving forward. We're now extending 765 kV into our zone and the Dominion zone for the very first time. I think Aaron mentioned that the timeframes to connect for us used to be two to four years, but now we're seeing four to seven years just to connect a new request. Our growth is still going pretty significantly.

We are working with the EDCs, working with the data centers, and getting more longer-term views of what their future plans are, which will help us help them get to the market much quicker.

There's a lot of competition out there among the data center companies. Aaron, may disagree, but not that long ago those companies provided only short views of their growth projections. Even in PJM they would really only do a projection on the system for five years out for data center load growth. And now we're — this year they're projecting out 20 years in the future.

So I think just looking longer term, extending our view of the transmission system much further for us and getting longer-term information from the large data center customers on what their future build out plans are going to be, will help us help them.

**MS. GAMACHE:** There's been a lot of restructuring on the generation interconnection side to try to weed out non-real projects, people just sort of fishing or putting in multiple interconnection requests and seeing what shakes out.

Is that a problem on the load interconnection side as well, do you think, and do you think that there will be similar proceedings to try to make sure that these requests are real or is that not an issue you've seen?

**MR. BAILEY:** To a certain extent, it is an issue. On our system, we've got well over 50 different developers of data center companies. And there seems to be a new one coming into play almost every day it seems like.

But the majority of our load is from the top 10. The big players are what's bringing most of the load. But we've been working with our cooperatives and our

retail service to try to make sure that before they bring a project to transmission, that it is real —that there are some checks that go through. Like site control, permits, etc. So putting forth a number of steps in check boxes to ensure that this customer we're getting requested to expand the transmission system for is a real connection that we need to take serious.

**MS. GAMACHE:** Karen, you mentioned that you just switched to a cluster study approach for large load. Has that weeded out some — has it cut down on any sort of false or multiple unused interconnection requests and streamlined the process at all?

**MS. ORNELAS:** Sure. We have load inquiries where you can pay a little bit of money, and we give you a high-level load assessment. Because some customers might just want to assess the situation. And then we have our application process, which was used for our cluster, where it's essentially folks that are more serious.

You pay more money upfront and then we study you. And we think that Electric Rule 30 will also help real projects move forward because the customer actually pays the upfront cost of interconnecting to the grid. And connecting to the transmission grid necessitates a real investment of dollars. This is our way of holding people accountable as well as having us taking accountability to build out the capacity for those projects.

But to the question you had earlier, we're also improving our interconnection process. We're looking at our entire process and trying to take out any waste to actually speed it up. We're looking at our own procurement of assets.

We also allow our customers to EPC [engineer, procure, and construct] projects that are greenfield. If there is an existing switching station or substation (Brownfield), we don't allow others to do work on them. We do the upgrades on existing assets. But if the interconnection engineering report says there's a new switching station that needs to be built, we will allow customers to EPC that themselves.

They do need to use a PG&E approved vendor for our transmission system. Our engineering team does need to sign off on the customer's designs, and we also have inspectors on site. And at the end of the day, when they deed over the asset to us, we need to sign off on it and make sure it meets our standards.

**MS. GAMACHE:** Okay. So switching topics just a little bit, but I see that we're running out of time and I want to be sure that we cover this. Jeff, you've actually written quite extensively about lessons the data center industry could potentially learn from the natural gas pipeline industry and just the value of competition. Could you speak to that a bit?

**DR. MAKHOLM:** Thank you, Kat. I'm here because of my long friendship with Harvey Reiter. He and I (with others, to be sure) battled with interstate pipeline interests over one of the last issues that could have *killed* the kind of regulatory system that basically left interstate pipelines to enter, exit, and price interstate natural gas transport without regulatory interference. We helped, on behalf of stateregulated gas distributors, to break the power of a group of interstate pipelines to profit from cartelizing what was, in the end, a structurally competitive industry. The fact that US natural gas costs \$2 when the same gas in Europe costs \$12 is largely due to the fact that the distributors, in the end, won their fight.

And I have also been lucky enough to have counted Alfred Kahn as a friend and colleague. Fred was appointed by Jimmy Carter to deal with another industry — regulated airlines — who also sought to profit from cartelizing an industry that has proven since Fred oversaw its deregulation, to be structurally competitive.

From such wider perspectives, it is impossible not to view the current data center disputes as contests between various parties (states, Data Centers, renewable generators in Dodge City) and RTOs as representing a similar sort of problem. Those supporting the sunk cost infrastructures that Data Centers represent want to enter their business competitively without undue regulatory barriers. Mason is right about that.

The RTOs, who above all have the interest of their own members in mind (as one would reasonably expect), have a different point of view. As some English scholars contend that all plots in the modern theater can somehow be traced back to Shakespeare, so the various current contests before FERC between Data Center interests and RTOs seem to some (like Harvey Reiter and I) just not that new. With the disputes surrounding Data Centers, some of us feel like we have seen that play before. And in that play, the remedies do exist to permit competitive entry and exit for data centers that don't burden you and me in our electric bills.

But that's the wider perspective that sometimes I bring to bear for those who look at more industries with more regulation and more contests between those who enjoy the current regulatory system as it exists. And I got to say that when Fred Kahn oversaw the era of competitive air travel, he knew that Pan Am and Eastern Airlines might not survive. And they did not survive.

But to someone like Fred Kahn bypass, cream skimming, all those things were not dirty words. They were the embodiment of competition that he sought to pursue in restructuring that business. That was the same that the gas distributors hired Harvey and me (and other people) to find a way for them to buy gas competitively and transport it competitively around the country. We succeeded in that. And in that respect, this story seems to be like a story that we've heard before, and the remedies do exist, even if not in the electricity industry. Thanks.

**MS. GAMACHE:** Thank you. Thanks for that insight. One thing that's really struck me just in our conversation, and Aaron, thank you for sort of bringing this out, is we've been really focused on the kind of the challenges that this load is bringing.

And Aaron, you drew some parallels — actually said, yes, the utilities have to provide us transmission, they have to provide us electricity, but these data centers actually are providing a really important service that the government is requiring and asking to be prioritized.

And it also makes me think about, well, perhaps data centers — like utilities — are also providing a public service that is essential; or parts of it are essential. And I mentioned a Wall Street Journal article earlier — one quote that jumped out at me from that was that data centers bring jobs and revenue that "make municipal officials swoon."

I'm wondering if we could wrap this up on kind of a positive note. I think it's clear we have a bunch of challenges, but there are some benefits and there is sort of a public service that is being provided by these data centers. I am wondering if anybody could speak to that.

**MR. TINJUM:** Yes, I'm happy to. And coincidentally, I emphasize coincidentally, today we released a new report that was conducted by PwC digging into the economic contributions of the US data center industry because it's an important question as we especially consider the grid investments and other decisions that need to be made to understand what we are truly supporting and what are we getting from an economic perspective.

A few key highlights from the PWC study — and you can find it on the Data Center Coalition's website if you're interested in learning more — between 2017 and 2023, the industry contributed nearly three-and-a-half trillion dollars to US GDP. Over that same 2017 to 2023 time period, direct employment in the US data center industry grew 50% compared to 10% growth in employment for the US overall.

From an indirect job perspective, the study finds that the US data center industry supports more than six jobs elsewhere in the US economy. So, oftentimes, there's a question about onsite jobs versus offsite jobs through data centers. And that's more than six jobs per every job in the data center industry. And then finally the tax contribution, to what you alluded, between 2017 and 2023, the industry contributed \$715 billion in federal, state, and local tax revenue.

So the economic benefits from the industry are profound. It's modern economic growth. It's supporting all facets of our society and economy, and now it's interwoven with the other economic drivers. When you think about things like managed electric vehicle charging that requires a data center. When we think about advanced manufacturing facilities and the robotics within them, those will rely on the digital infrastructure provided by data centers.

When we talk about autonomous driving which generates and consumes vast amounts of data, that will also require the digital infrastructure provided by data centers. So data centers will continue to play an integral role in our society today moving forward. And will only do so at a higher level. I think my takeaway would be let's not miss the opportunity and importance of this industry and recognize the role data centers are playing today, and will do so in the future.

**MS. GAMACHE:** Great. Well said. And I, for one, really want the value of my smart appliances and other 21 devices that use the cloud currently.

Well, with that, we are at time. I feel like we could probably talk all day long, but I think we've covered a lot of ground and we've come up with some discussion of the challenges, we've come up with some solutions, and I think we've done a good job of getting the industry discussing this and resolving this. Thank you all in the room for attending in person. I really appreciate it. And hopefully I'm not overstepping my bounds by saying I'm sure Jeff and Mary Ann will stay a few minutes and answer any questions that you all might have in the room. And to all my panelists, if we could just give them a round of applause. I know this is a significant amount of time, this is an important topic and we really appreciate you chiming in and all of your insights.