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WHY ARE ELECTRICITY PRICES RISING IN THE US AND WHAT CAN BE DONE ABOUT IT?

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WELCOMING AND MODERATOR

SANJAY PATNAIK

Bernard L. Schwartz Chair in Economic Policy Development, Senior Fellow, and Director,
Center on Regulations and Markets, The Brookings Institution

KEYNOTE AND FIRESIDE CHAT

JOSEPH BOWRING

President, Monitoring Analytics

PANEL DISCUSSION

BRENDAN PIERPONT

Director, Electricity, Energy Innovation

ABE SILVERMAN

Assistant Research Scholar, Ralph O'Connor Sustainable Energy Institute,
Johns Hopkins University

RYAN WISER

Senior Scientist and Senior Advisor to the Energy Markets and Planning Department,
Lawrence Berkeley National Laboratory

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PATNAIK: Good afternoon everyone. Thank you so much for coming to Brookings for this event today on electricity rates despite the heaviest snow that was predicted. My name is Sanjay Patnaik and I'm the director of the Center on Regulation and Markets here at Brookings. And this event today kicks off a new work stream at our center that we are implementing on AI and energy with a special focus on energy affordability.

When you think about it, electricity is really the lifeblood of our economy. Without it, we can't work, we can't study, we can't run our offices or our factories. It is a major driver of economic growth and the engine that keeps our modern society functioning well. Over many years, the US experienced pretty flat demand for electricity, but this started to change quite significantly a few years ago when demand for electricity started to rise rapidly.

As a consequence, we are now witnessing a significant increase in electricity rates across the country, which is putting immense burdens on many households who are already struggling with cost of living crisis in many other areas. To explore the reasons for these electricity rate rises that we have seen and that we're experiencing, and to explore what our country, our policy makers could do about it.

We have a great lineup of experts here today. We're gonna start off with a fireside chat with Dr. Joseph Bowring, who is the President of Monitoring Analytics since 1999. Dr. Bowring has been the independent market monitor for PJM Interconnection, responsible for all market monitoring activities of PJM, which is the largest regional transmission organization in the United States.

Afterwards, we'll move into a panel where I am joined by three experts, Brendan Pierpont. He's the electricity Director of Energy Innovation. He will join virtually. Abe Silverman, who is here in the room, an assistant research scholar at John Hopkins University, and Dr. Ryan Wiser, a senior scientist at Lawrence Berkeley National Lab.

We have received a lot of advanced questions, so thank you for that. And I will try to work them into my fireside and into my questions for the panelists. But for anyone here in the audience today, if you have questions, we're gonna take questions for the panel, not for the fireside because it's shorter.

My team is walking around with flashcards. Please wave them down and you can write down the questions and I will try to work them in. Okay. It's a very interesting and hot topic, I think. And so with without further ado, I would like to ask you to please come up here.

Welcome, and thank you so much for doing this today.

BOWRING: Thank you.

PATNAIK: Maybe you can tell us a little bit about your role related to PJM. Kinda like what do you do for them?

BOWRING: Hello everyone. I'm the Market Monitor. That's it, that's all I have to say.

So we have three fundamental roles to by FERC in the PJM tariff. One is monitoring and making sure that participants behave competitively. And if you can think of a creative way to violate the rules or exercise market power. Believe me, someone's thinking of it right now or has already tried to implement it, but we also monitor PJMs behavior. PJM single handedly has more effect on the market than any single participant by far.

Secondly, we do reporting. If you go to our webpage, you'll see every quarter we put out an 850 page document called the State of the Market Report, which covers all aspects of PJM markets. And last but not least, and this is controversial for some, even though it's written in the tariff, I've been yelled at by members of the PJM Board in public that I shouldn't do this part.

And that is make market design recommendations. And part of what we're doing in this whole data center space is doing exactly that, making recommendations, how to modify the market so that data centers can be integrated, but without imposing billings of dollars of cost and everybody else.

PATNAIK: Great. Thank you.

This is a very helpful context. So let's dive right in. According to the most recent monitoring analytics report, the total cost of wholesale power in the PJM market increased by more than 40% between

2024 and 2025. Is this kinda like a typically year to year fluctuation, or is this really something else that is going on here?

BOWRING: It's something else. When people come, there's a counter narrative building out there that says prices aren't really going up. There's some, you know, academic papers, prices aren't really going up well, it really depends on where you start and where you end. If you start in 2001 and end in 2024, nominally or inflation adjusted prices were fairly flat.

CPI adjusted absolutely flat. Nominal went up somewhat, but not huge. A 50% increase year over year is fairly unusual. But if you think about January of '25 to January of '26, price increase was a hundred percent.

PATNAIK: Wow.

BOWRING: But you have to, when you're thinking about PJM prices, it's wholesale market prices.

Think about three components. There's the energy piece, there's capacity and there's transmission. And it's best to look at it in the long haul. If you look at a figure over 20 years, 25 years, you'll see. The energy piece is very volatile. The energy piece is about 50%, but it can vary from 40% to 80% of the total wholesale power bill.

So it fluctuates. And on the bottom we have transmission, which is slowly ramping up, and we have capacity, which is pretty low, and now it's taking a big bump up. So now it's about 50% energy, 25% transmission, and 25% capacity. For the first time in 2019, the cost of transmission exceeded the cost of capacity, which is pretty shocking and the result of pretty significant increases year over year in transmission costs.

But when you think about what's happening, recent events in particular data center and all the impacts they had have changed prices significantly year over year. And in fact the impact of data centers on capacity prices was first felt in bills June 1st, 2025, which is when you first started to see some of the political reaction, 'cause it didn't actually hit until 2025. But we've now locked in prices for, in PJM we work in the capacity market delivery year, so June 1st to May 31st. So we have '25-'26

locked in, '26-'27 is locked in, '27-'28 is locked in. And we're about to have another auction for '28-'29. So those price increases are locked in right now, the impact data center is Iver irreversible at the moment it's been locked into capacity market prices.

It's a done deal.

PATNAIK: And so when you look at those increases, is this really mostly related to PJM or do you see that across the country? Are these like factors that are locally or is it like nationally driven?

BOWRING: I don't pretend to, it's not gonna stop me by the way, but I don't pretend to know about the other markets anywhere near the level of detail.

I know about PJM 'cause we, we study PJM but I think there are some longer term trends that, that affect everyone and which will mean that everyone will be affected. One of the things to remember about PJM is it's a market. Miso is not really a market. SPP is not really a market. California's not really a market.

New England and New York are much more like markets, much more like PJM. But what that means practically for all this is that PJM has single clearing price markets, which is the way markets typically work. And if the marginal price is high, you're gonna set the price high for everybody. So one of the underlying dynamics is in addition to the fact, so you have this slowdown.

If you have, if you're doing embedded costs, it's gonna be a slower impact. It'll take longer to catch up. So Miso, for example, has cost and service regulation to set their capacity values, whereas PJM as a market. But the key point there is the marginal cost is higher than the average cost. If you only you know, economists like to have trite little phrases.

So usually I say, well, it's supply and demand, but I'm branching out. Marginal cost is higher than average cost. That really, if you look back over the last 50 years of power prices. And all the politics and perpa and everything that has come since it's really all about that, it's about whether marginal prices are higher than average prices.

So what does that mean? It means, in the case of PJM capacity market, which is tight, it's absolutely tight. Right now there's no surplus. In fact, there's a shortfall. If you need another megawatt, you gotta pay the cost of a brand new turbine that sets the price for everybody. So marginal cost is a higher, so as you as load increases, prices go up.

And despite what you've heard from the academics at Duke, it is absolutely not true that there's free power to be had and thousands of megawatts of data centers can be served for nothing. That is nonsense. There's no free capacity. There's no spare capacity. PJM is tight. And if you add more demand, add the need for more capacity, everyone's gonna pay that cost 'cause you're driving up the marginal cost.

That's really the underlying dynamic.

PATNAIK: That's actually really interesting. So when you're, when you talked about the wholesale prices how do the prices usually get passed on to rate payers? Can you explain that process a little bit?

BOWRING: No, but I'll try. So wholesale power prices are set by the PJM market. They're then passed down to customers in a variety of ways. So think about the wholesale power market. Back in 1999, the markets were not deregulated, but restructured. There's no, deregulation has never occurred. It's not going to occur. It shouldn't occur. But PJM established a market, a power market effective April 1st, 1999, in which power prices were set by by competitive offers and demand, and prices were locational, marginal prices.

So the next entity in this chain of pay, of payment is what's called the EDCs, the electric distribution companies. So they're the old, think of them, the old fashioned transmission owners. So in PJM, it's Pico, and p, and l, and P, s, E, and G, so on. And there's been some combination, but it's basically zone by zone.

Think of it. But within that, when you have a, when you have individually restructured states, so remember, some states decided to allow competition to serve retail load. Think of them as

restructured states. So in those states, there's also a separate entity called a load serving entity, LSE. And if you don't know yet about PJ M, it's all acronyms all the time.

So e, d, c, the, or the tos, the transmission owners. There we go. Transmission owners zone, and the LSCs. An LSC, you could, any, one of you could start an LSC. All you need is a computer and maybe some credit. And you could start an LSE. You bid in a state auction to take a, to pick up a tranche of load. And it's purely financial.

You're buying energy and capacity, ancillary services and selling. So it gets to the retail customer one of those two ways. And then the state public utility commissions have a role because, for example, in New Jersey, as Abe knows very well, there are lots of things added to the bill in addition to the cost of wholesale power.

So there's a cost of distribution system, which is part of it, all the customer related functions of the EDCs. But also there, there are other additions. I don't think, I hope people are not still paying off stranded costs from the nuclear power plants from the restructuring, but they might be.

But there, there are other adders that the state commission adds on so whole wholesale costs. I don't, I actually, I'm not even sure what portion of the retail bill that typically is, but the wholesale cost generation, transmission, and and capacity. And then that gets passed down through the EDCs analyses.

PATNAIK: Great. This is very interesting. So I wanna dive a little bit more into kinda like the causes for the rate increases. Right. And you mentioned the data centers earlier, so I'm curious, like you hear a lot of, like analysts write different things. You see, we had electrification that was being pushed by the IRA under the federal government a few years ago, and on the state level decarbonization efforts, which also like led to more demand for electricity with EVs and electric water heaters, et cetera.

Then we have the AI data centers that is really a big boom over the last couple of years. We also have other utilities that are having to incur costs to harden their infrastructure against new extreme weather events. So kinda like if you look at all these different factors, what are you think are the most important factors driving those increases?

BOWRING: Yeah. In the case of PJM, in the case of the capacity market, which is where the really dramatic changes are coming from, it's data centers. And it's nothing but data centers and the people who start trying to muddy the waters with EVs and electrification. That's not true. Absolutely not true. There's no data to support it.

It's not true. Our data shows that it's data centers last three capacity auctions, \$23 billion in additional costs for everyone else, a result of data centers. And just to put that in perspective, that's about 40% of the cost of capacity. So in the last or put it, so just you have, it's useful to think about in perspective.

So if you think about the costs, there were extra costs incurred in the 25 26 auction for capacity beginning of June 1st. That divided by the total bill, total power bill for the entire year of 2025 was about 14%. So that's a huge piece. Data centers capacity is a relatively small piece, as I said, 25% of the total bill.

The significant increases in capacity costs from the data centers translated into overall, think of it, about 14% of the total bill in 2025. This, it's not a precise comparison because one is runs from May to June, the other runs from January to December. But that's the basic idea.

PATNAIK: Okay. And when you look at the division, you mentioned it earlier, between generation transmission, kind of what are some of the major drivers there?

Is it a lack of generation? Is it like the transmission line's not coming online fast enough? Is it a combination?

BOWRING: Yeah, no, it's a great point. I'm not coming on fast enough. So one, one of the longstanding issues in Pyjama has been managing the queue right. And the queue is you have to get in line to be hooked up to provide power to PJM because it's an interconnected grid.

And the rules in PJM appropriately enough, unlike in erta rules in PJM, require the generators to pay for their own incremental incremental interconnection costs. That could be. Anywhere from zero to a couple hundred million dollars, depending on where you're located, gives you an incentive to locate

where there's relatively cheap gas and where you can hook up to the transmission system relatively cheaply.

But PJM had, I think, what's fair to say, a really badly mismanaged queue process, which never made the transition thoughtfully from a couple of gas fire combined cycles every year to hundreds and hundreds of little solar and wind resources. So PJM stacked them all from bottom to top.

And there, there was an incentive for developers to put projects in that didn't plan to finish.

PATNAIK: I see.

BOWRING: Right. So they were basically speculating on spots in the queue. So what happens when the fifth one out of 150 projects in the queue decides to pull out every single project after that has to be restudied.

Just imagine that going on and on. It's insanely ineffective and inefficient.

PATNAIK: Wow.

BOWRING: And it caused a total bog down of the PJM process. At the high point, there were 250,000 megawatts in the queue waiting to come on. So eventually, and way too late, PJM figured out they needed to solve it to a pretty radical fix.

Actually stop taking any more for a year. They, by imposing additional requirements, they reduced the queue from 250,000 to about 40 or 50,000. They imposed stronger financial requirements. So you really had to be serious about being in the queue, but people are still not coming online. There was so much uncertainty created.

I, I think the role of the Q is understated when you think about why. Why we're short capacity, so the Q is a huge part of it. Transmission costs are very significant. I don't know if you follow it, but there's been a debate since order, I should remember the number 888, I think it was.

No, that's not it. What was the, what's the number of the transmission order? Maybe may thousand. Yeah. Yeah. Order 1000, which said it's supposed to be competition to provide transmission, but PJM has PAM and the CEOs have managed to resist that. There've been some competitive projects, but by and large the transmission owners figured out a way to evade that for the bulk of the project.

So a lot of transmission is simply built under rate-based rate of return, which, as we know, is a relatively inefficient, costly way to do things. But the competitors, unfortunately, also playing by rules, which really, they wanna become regulating utilities rather than competitors. So the competition for transmission has hardly been a panacea, but that's part of it.

So we had, we've needed more transmission, significantly growing, very significantly, but primarily we're out of capacity. PJM cleared. 600 megawatts short of the requirement for the first time ever. So we went from a one in 10 reliability standard to about one in four according to what PJM said in a meeting recently.

As you can see, that, that's a radical reduction in reliability. And if you keep adding, if you add 60,000 more gigawatts, 60,000 more megawatts of data center load, you don't have a generation, it's not gonna work.

PATNAIK: That's really interesting. So when we look at these three parts you talked a lot about the Q, like if you could advise them ideally to reform the Q process, what could they do?

BOWRING: Well, I think they've done most of it, but there's, it's still it's still relatively inefficient. That is, it's, there's a lot of manual

PATNAIK: Okay.

BOWRING: Parts of it. So they've actually apparently hired, or they've hired Google and their and one of their, one of their creative software sites to try to automate some of it.

So they certainly need to do that. But the idea that you have to wait for a year or two in acute to decide how much money you have to spend, and then you can't even guarantee you're gonna come

on is a problem. You have to, the point is to reduce the uncertainty to give people a fast track. If they're ready to go, ready to become commercial, it should be allowed to come on as quickly as they can.

PATNAIK: And who, like, who determines when they can come on? Like how big is the staff at the office, like,

BOWRING: yeah. I would,

PATNAIK: working on the q I'm curious.

BOWRING: I would say the plan, the planning group is definitely understaffed.

PATNAIK: Okay. Without, so that's another,

BOWRING: yeah. Yep. Yep.

PATNAIK: And so when you look at the transmission lines, transmission is complicated, right?

It has a lot of permitting issues at the local, state, and federal level. What are some of the reforms that you think might be helpful here to bring transmission lines?

BOWRING: Yeah. Interesting, those of the q and transmission lines, but to the QQ as well, which is that states and localities could do a much better job of expediting the process of getting permits, right?

And being able to come online. There are lots of local .

And they serve a function of course, and you want, you have to protect the local folks. And I personally believe in nimby. I'm not sure I'm all the way to banana, but I don't want a transmission line in my backyard, nor do I want a data center next to me.

So I understand though. So people have to have their ability to intervene, but it has to be, that process has to be as efficient as possible.

So that, that would affect both transmission siting and and just generation siting as well.

PATNAIK: So really kind of like work at the local and state level to at least unclog some of the transmission.

BOWRING: Yeah. It's all, when you get down to it, it's all nitty gritty detail that you really have to work through. There's no kind of one big policy recommendation. I can say easily fix the queue process, but it's actually really hard to do it.

PATNAIK: Yeah. And what about generating capacity?

I think that's probably a bigger issue. What do you see are some of the more promising new generation capacities that are coming online that might be faster online? What kind of energy sources do they rely on?

BOWRING: Yeah, so PJM is has relatively little renewables. Relatively few intermittents.

It's less than, certainly less than seven or 8%. Okay. Solar, wind, solar is growing faster than wind at the moment. As you know, offshore wind for reasons that escape me has been been largely canceled as we know. So to, to me, we're gonna see a lot more gas fire generation.

We'll continue to see growth, I think of solar and wind, which makes sense. It's cheap energy. And it's definitely competitive of gas fire combined cycles. But we're gonna need more gas fire combined cycles to get through situations like we did in this, the winter storm firm, the prior winter in January of 2025.

But one of the things that doesn't get talked about enough in the whole capacity market area is the need for more firm gas infrastructure. Because if you want a power plane to be on in the winter, you better have a way to get a gas. 'cause that's when everybody else wants the gas.

So if it's purely interruptible gas, you're not likely to get it.

PATNAIK: So the pipeline infrastructure basically.

BOWRING: Right.

PATNAIK: Exactly. And so also when you look at like the entire PJM retail, like, does it matter much where some of these demand is coming from? Where the data centers are located on, where the rates go up?

Is, does it matter that in Virginia you have most of the data centers, will that affect the Maryland rate payers, Delaware rate payers? How does that work?

BOWRING: Yeah, it does. So the billions of dollars are invested in transmission to get power to the Virginia Data Centers data center Alley.

But the way those costs are assigned, they were not assigned to the data centers.

They're not even assigned to Virginia. They were assigned and using their normal allocation process, which meant that customers in Maryland, Delaware primarily were paying billions of dollars of costs for transmission upgrades to serve the data centers. I think it's very difficult to actually directly assign transmission to data centers.

If every data center paid their share just on a, on what's called in PJMA knit basis or an on a, an average rolled in transmission rate, I think everyone would be better off than trying to assign them directly because fe. Just put out this co-location order and it's the only docket number I remember.

If I can remember, I think EL 25 dash 49 which basically tried to get cute with cost allocation, said, well, you know, if you agree not to use more than a certain amount, we're only gonna assign you part of the transmission system.

But it's not about changing what actually gets constructed. It's not actually my view, not about changing the actual costs. It is purely about allocation, which is always how large customers have

avoided paying what I would regard as their fair share of the transmission costs. The co-location order is very significant because it's attempting to change the allocation of cost for data centers.

PATNAIK: That's interesting.

BOWRING: But data centers, but just where you began was a very important point, 'cause PJM is a locational market. LMP is the locational marginal pricing on the energy side. That's fundamental the way PJM works. That means that every one of thousands and thousands of nodes has potentially a different price depending on what the short run marginal cost of generating power at that node is.

Same thing's true for capacity. You cannot serve a data center in Newark, New Jersey with generation in Chicago. But most of the proposals for dealing with are not focusing on that question you raised, which is about locational. So capacity market's locational, it clears locationally. One of our recommendations for how to deal with this is to have a separate auction just for data centers, but it has to be locational, has to have all the elements of the standard auction, has to have transmission constraints, has to have the location of the data centers, has to have the location of the generators in order for it to work location.

It really matters in PJM.

PATNAIK: So then you would allocate the cost according to like how much transmission line they're using, where they're located,

BOWRING: right? Is that what they have in mind? So what I have in mind is everyone pays their share of the transmission system, which is just whatever the billing determinant is, whether it's peak load or average load, you just, you pay it no matter what.

But for generation, what I, what we're proposing in the mark of honoring unit is that data centers be required to either bring their own new generation themselves, which some are doing or or pay through this auction to have capacity assigned to them, but it would have to be capacity that works one of the things that we think is a bad idea.

And interestingly the White House, both through their principles that they published a few weeks ago, as well as the statement that's supposed to come out this week about data centers. It recognizes correctly that they have to be served by new generation, because otherwise you cannibalize the old generation.

You're making everyone else short of capacity.

PATNAIK: Yeah.

BOWRING: And you're making it everyone else's problem. So gener new data centers need new generation.

PATNAIK: And so then I'm curious, like I've seen some proposals in Congress that would require data centers to kinda like build their own supply completely. Right?

Right. Independent from the main grid. What do you think about that?

BOWRING: No. I mean that, that makes no sense. So the grid is the grid and it's there for a reason. It provides backup. So there, there was this proposal for a while called co-location, which pretended that a data center would be, and this actually happened with Talon Susquehanna nuclear power plant in Pennsylvania.

There was an Amazon data center. You pretend that you're you're behind it and therefore you have to, don't have to pay for any of the grid. And you don't, you're basically entirely isolated from the grid. But that's not true. No one's ever isolated from the grid. And when I, for example, when that data center goes off.

PATNAIK: No,

BOWRING: the power from the power plant is injected into the grid suddenly, or when the power plant goes off, the loa from the data center still exists. Everyone relies on the grid. I think it's a fantasy to

pretend that you don't have to. Yeah. It is literally possible to isolate yourself from the grid, but then you have to provide all of the ancillary services, all the backup, all the reserves.

It's very inefficient from a social perspective and expensive from an individual perspective to try to be off the grid.

PATNAIK: Yeah, and if you think about it, we don't treat other industrial customers differently, right? Like, I'm curious what your thoughts are, what makes data centers so different from like, I don't know, a manufacturing plant other than like obviously the huge energy demand, but there are other industrial customers that also use a lot of energy.

BOWRING: Yeah, no, it's an interesting question. It's a, it's been a cost some debate. So people ask me about that and they say, aren't you discriminating against the data centers?

PATNAIK: No.

BOWRING: And I say, yes, but the Federal Power Act says you can't engage in undue discrim. So I think it's appropriate that data centers pay their own way.

It's a unique phenomenon. There's, think of 60,000 more megawatts of demand of data centers. The total winter peak load is about 145. Summer peak load is about 165 or so. So it's a huge increase in the amount of capacity. The marginal costs, as I said before, extremely high. It's unprecedented, unusual and so there, therefore, I think it is appropriate to treat them differently.

But you're right, they're large industrial loads, but I, what I call organic load has been growing pretty slowly. It has not cause these kind of issues for the grid. It will cause prices to go up, but much more slowly and gradually in a way that people can absorb them. This is a, you know, to, this is a tsunami and it has to be addressed.

Either you tell the data centers, they can't hook up until there's enough capacity. Or you figure out a way to ensure that they bring their own,

PATNAIK: that we have the capacity. And so then when you think about like rate payers, where should they turn to, right? Like how is the responsibility for the electric system divided up between local, state and federal or across state?

Like what, where can they turn and say, look, this is too much for us. We can't afford that. We need reform.

BOWRING: Yeah, good question. So partly they can turn to their local public utility commissions.

PATNAIK: Okay.

BOWRING: But the public utility commissions have no control over, excuse me, over PJM. So public advocates and the public utility commissions participate in the PJM stakeholder process, but as they keep pointing out correctly, they have a relatively small voice.

So it's FERC. Federal Engineer Regulatory Commission really controls transmission costs and generation costs. The bulk of the wholesale power costs. And the local public utility commissions and governors control the local costs.

But the big source of rate increases for customers has been in PJM, the capacity market. And customers have no recourse other than to go to the FERC. And that's very difficult for individual customers to do.

PATNAIK: And do you think, I've seen pushes at the state level of trying to subsidize energy or like helping low income families. Do you think, would that help, like in the long term or is that more like a short term patch to help families get through the,

BOWRING: look, mean having income redistribution is fine.

It make, it makes sense to ensure that across across income distribution people are being treated fairly, but that doesn't address the underlying issue, which is that someone's gonna have to pay the higher cost unless we address the root cause of the cost.

PATNAIK: Great.

BOWRING: So I would say more competition and transmission. And make sure the data centers bring their own generation, their own new generation.

PATNAIK: Great. Thank you so much. This was great.

BOWRING: My pleasure. Thank you.

PATNAIK: Thank you.

I'll invite Abe up here and then our two virtual speakers.

Hello, Ryan and Brendan. We're welcome and thanks so much for joining us here today. It's a pleasure to have all three of you here. We're gonna try to dive a bit more into detail of all these different electricity rate increases that we've seen.

Maybe you can e each one of you start a little bit about kinda like your own area of work and like how it relates to what we currently see. Abe, you wanna start?

SILVERMAN: Yeah. My name's Abe Silverman. I'm I'm, I like to refer to myself as a recovering FERC attorney. So I've been sort of in this energy space my entire career.

Most of my career I've actually worked for industry as a, you know, representative of a large power plant developer. And then I had the opportunity to make more money. And so I went to work for the state of New Jersey at their public service commission. That's a joke, by the way. Made a lot less money.

And so I was there for four years during the early days of the Murphy administration, really focusing on how we deal with markets and PJM and where we get our power from. And then when I left New Jersey, I moved to originally Columbia University, and now I'm a research scholar at Johns Hopkins Univers.

Talking about why are our electric bills going up and how can we decarbonize at a price that we can all afford?

PATNAIK: Great. Thank you Brendan.

PIERPONT: Great. Oh, thank you. Thank you for having me. I'm Brendan Pierpont. I direct Energy Innovations, electricity Policy Research. We're a small think tank research organization looking at a similar set of questions to what Abe just outlined.

How do we address affordability challenges? How do we meet the climate goals that we need to meet, to address growing climate risks and do so while protecting customers? I've been with energy innovation for. Just about two years before that long career in a variety of research capacities supporting groups from advocates to independent research NGOs.

Glad to be here. Glad to be joined by a great panelists today. So thank you. Great.

PATNAIK: Thank you so much. Ryan, please.

WISER: Yeah, greetings all and thanks to Brookings for putting on this event. Certainly a hot topic these days, that's for sure. So yeah, I've been at Lawrence Berkeley National Lab for some number of decades now, tracking and analyzing the US power sector.

And a little over a year ago, I and my team opted to turn our attention a bit to the now hot topic of retail, electricity, price trends. And so we've been steeped into in trying to understand some of those trends and drivers over the last year or so. Happy to be here.

PATNAIK: Great, thank you so much. So let's dive right in and maybe Ryan, we can start with you.

You, you said you, you look at at retail prices and probably it's presumably across the United States. So when you look at the potential drivers for these rate increases, we heard the perspective from PJM. There are a lot of different factors at play. Data centers are at least being tossed around electrification, hardening against climate risk.

What are the factors that you mostly find when you look at different areas in the United States?

WISER: Yeah, so maybe to start there, I wanna emphasize that the retail price increases that we're seeing across the country are not in any way uniform.

There are some states and regions that have seen very significant price increases well above the rate of inflation, and there are an equal, if not larger number of states that have seen price increases, but price increases that have been running short of or less than overall inflationary pressures.

And so when you talk about places where retail prices have spiked the most, you're really talking about my home state in California, the Pacific Seaboard, the Northeastern states, New England and New York. And now very recently as a will certainly speak to as well. And as Joe Bowring just described the PJM state.

So those are the states that have seen the most outsized increases in retail prices over not just the last year, but really the last five, six years or so. In our research at LBL. You know, every state has its own story to tell. I wanna be really clear here. But ultimately, four factors are the primary ones that have driven prices up in those locations where prices have gone up.

First though, we talk about electrons quite a lot, the poles and the wires, the transmission and the distribution system play a very significant role here. We can talk more about that, I'm sure in the further q and a state, clean energy policies, they matter and they can increase prices in some circumstances.

That's especially true in some of the Northeastern states that have very aggressive clean energy policies and programs that don't have the same resource quality. It's not as windy and sunny in Massachusetts as it is in many other parts of the country. Natural gas prices. Natural gas prices have gone through some serious gyrations over the last five or six years.

Of course, at the onset of the Ukraine, Russia war gas prices increased dramatically that impacted retail electricity prices. Really in any state that is highly dependent on natural gas natural gas prices

have also increased rather substantially. Over the last year, and let me just be really clear, natural gas in general is pushing retail prices down.

There's a reason that retail electricity prices in the US are lower than in many other industrial countries. Low cost natural gas is one of those reasons, but it's a volatile commodity. The price varies and we as consumers confront that volatility. And then finally load growth and contraction. And here the story is in no means.

Simple or unidirectional. We will certainly talk a, will certainly talk about load growth and really expected load growth in PJM and its impact on increasing prices. Certainly that was the nature of your fireside chat as well with Joe. But I also wanna emphasize that the states that have seen the largest price increases over the last six years are those that have had contracting load.

Think about the states I talked about, California, the New England states. New York load has declined in most of those states, and so it's hard to claim that load growth has pushed prices higher when the very states that have seen the highest price increases are the states where load has been shrinking.

We could talk about the mechanics there, but I guess the bottom line here is that the load growth story is not a story that's fully been told to be sure. But it's also not a simple story.

PATNAIK: Great. Thank you. That's very interesting. Brendan, over to you. What are your thoughts on

this in your research?

PIERPONT: Yeah, I, so I I think when we've looked at this same set of questions we've certainly identified a lot of this, the same trends that Ryan just overviewed a large long-term upward trend in the infrastructure costs for transmission and distribution, which I think deserves some unpacking.

The, there's, when we look at the transmission side of that we're raising our transmission costs over time, yet not building as many line miles. We're not building the long distance transmission that can actually tap into lower cost generation sources that would then have really material.

Benefits on the overall cost of serving customers. Instead we're building a lot of local projects as Joe Bowring was describing projects that fall outside of the, for a quarter 1000 planning processes. And there's a disconnect I think between what we see in transmission costs and transmission spending and the potential benefits of that transmission in unlocking low cost energy sources.

By getting that those great wind resources from the wind belt over to the the, say the load centers of Northern Virginia and New Jersey. And on the distribution side I think it's also quite a complicated story. There's some data from I think it's survey data from Edison electric Institute that suggests that somewhere around a third of distribution, capital investment is adaptation, resilience, grid hardening investment.

Another third is replacing aging infrastructure. And so when we are looking at what's going into that distribution spending, which is again this growing one of the fastest growing components it's not expanding the distribution system to meet. Growing load or electrification necessarily.

It's in a high cost environment replacing the aging infrastructure and making the grid more resilient. And that's it's again, a complicated spending picture. We do also see some of the same trends that, that Ryan was pointing out. The volatility of natural gas prices where even a one year price spike or a one and a half year price spike like we experienced in 2022 that can stick around on bills for several years at a time.

And and well after the spot prices have come back down and right now we're entering a new era of geopolitical uncertainty. So how that plays out I think remains to be seen. And then yes, very much agree. The complicated picture on load growth. I think a lot there deter is dependent on how that load growth shows up in planning processes or market structures like PJMs capacity market in terms of what ultimate impact it has on rates.

PATNAIK: Great. Thank you.

SILVERMAN: Yeah. I, you know, it's been really interesting data centers. I, you know, I refer to them the whole industry as a toddler and like any three or 4-year-old, which is basically how long this new AI industry has been around. It doesn't really know what it wants to be when it grows up.

But if you ask it right now, it wants to be a scientist, astronaut, art teacher. It wants to do everything. And that's reflected in the amount of new generation, excuse me. Excuse me. Lemme take that back. The amount of new load that they're requesting to use, what is load? It's just using electricity.

So we have the data centers coming in asking. In the PJM region, so that's the Mid-Atlantic region. We're in PJM right now goes, you know, basically up to New York, down to the Carolinas, west of Chicago. And that region is seeing, you know, somewhere around 13 gigawatts of new load, mostly from data centers wanting to come onto the grid a year.

And like, let's talk a little bit about what that actually means, because I think it's helpful to, you know, unpack this a little bit. The city of Baltimore uses about six and a half gigawatts of electricity every year. So we are talking about adding two Baltimores to the grid every year between now and the early 2030s.

If you believe the projections, put another way that's approximately 10 new, large nuclear power plants a year. Which we are nowhere there. And so what we basically are saying is there is tens of billions of dollars of new energy infrastructure that is required to serve this class of customers, these new data centers.

And the question becomes who pays for it? And you know, and this is a great discussion. I'm really glad to be on with these two gentlemen 'cause I actually rely on their work quite a bit. And so we see these sort of long-term trends and prices go up and prices go down. And I think the question that I struggle with is, are the data centers different?

You know, Dr. Bowring talked about it being not undue discrimination. Yeah, I agree with that. I actually think data centers are different 'cause we simply just do not have new cities coming to seeking to hook up to the grid on a daily basis, or at least we haven't until now. So it's not, I don't think it's a huge mystery.

About why we're seeing such large price increases. 'cause at the end of the day, this is just supply and demand, right? You can get as fancy as you want about it, but where we have, you know, fairly

constant supply or supply that changes really slowly and you have a ton of new demand coming onto the system, prices go up and that's where we are right now.

PATNAIK: Great. Thank you Ryan, I want to come back to you a little bit. So you mentioned that there's a lot of variation across states in rising electricity prices and that even states that have not had any load growth, like in New York and other places, you still see the prices spike. So what drives those price spikes and why do you see so much difference across different states?

WISER: I think you see differences across different states simply because states are different. Some are hit by storms, winter storms, hurricanes, and have to rebuild others, not. My home state of California, my electricity price has gone up dramatically, largely because of wildfire mitigation and liability insurance claims.

Not a problem In many of the northeastern states, certainly not of the same magnitude. States have different policy mechanisms, different societal objectives and programs that they're seeking to achieve through electricity policy and regulation. And of course, states have different resource endowments, different resource mix.

The supply demand balance can vary by state and region as well. And so the fact that the underlying drivers of price increases vary across states should come really is no as no surprise. California, we've had declining load for a long time. Our prices have increased the most. It's not data centers. Data centers has had played no role in increasing the prices in California.

Indeed the CEOs of the major electric utilities into this state have noted that they would welcome data centers because they would be able to spread some of the fixed costs of their electricity system over more megawatt hours, which mathematically reduces electricity prices. In California, the story is largely one of wildfire mitigation and liability insurance and increased distribution and transmission expenditures.

The PJM story is a totally different story, and the T centers are a big part, not the only part, but a big part of that story. So I think it's ultimately just that we've got states differ because states differ.

PATNAIK: Great, thank you. Abe, I wanna talk to you a little bit. So you grew up in Maryland, and so Maryland is an interesting example.

The Maryland has seen a huge spike in electricity rates over the last year. There are a couple of reports that have attributed it to decarbonization strategies at the state level that Ryan also mentioned could play a role because they shut down several coal fired power plants, but didn't replace them with the same capacity supply and demand right. Rates spiked. So what do you see the main reasons for the rate spikes in Maryland? Is that a case study that has lessons for other states on the East Coast and PJM? I'm curious what you think.

SILVERMAN: Yeah, you know, I really like Ryan's point. Every state is different. Every, you know, all happy families are happy in the same way.

So Maryland has a couple things going on. You know how many people are Maryland rate payers in the room? I'm guessing? Yeah. Okay. All right. So you have all probably saw on June 1st, 2025, your electric rates went up and the question is why? And you know, it's, it is a story of death by a thousand cuts.

There's a lot of individual pieces, but that the end of the story is the giant sledgehammer. So absolutely, we have seen transmission rates increase over the last few years, really almost across the entire country. And that is a major part of the story. We've seen distribution costs increase, and it is a lot of that local distribution piece.

These are the wires leading to your house, you know, so when you look at your electric bill, approximately half of it is state charges, the distribution system, those small wires and then transmission, which is the big, you know, the big bigger wires, right? And both of those are seeing the increases.

The other half of the bill is what we call the supply portion, and this is the cost of generation and capacity and energy. And as everybody has noted, there's a lot of reasons why all those costs are going up. But the one that really hit us. Starting on June 1st, 2025 was what we call the capacity market.

You know, it's, I often say the biggest threat to the clean energy transition is acronyms. And there are so many acronyms out there. Capacity is one of these kind of obscure concepts, but it's basically a payment in the future to make sure that we have the right number of generators in the right place on the system so that we don't have a supply related outage more than once every 10 years.

And what happened for Maryland in particular was we got hit really whacked. I could say that 'cause I'm from New Jersey these days. But we got whacked with very high increase for, we went from record low capacity prices to record high capacity prices basically in a single year.

And that what, what really changed? Yeah, absolutely. There were some generators including fossil fuel resources. That retired because of either environmental reasons, but the real reason they retired is because of price signals. We had a surplus in capacity in PJM for years. We had record low capacity prices. And so a lot of particularly older coal resources and other older fossil fuel resources said, I'm out, the prices are telling me to retire.

I'm gonna follow the economics and I'm gonna retire. And that's what happened with all those resources in Maryland, which are, you know, I'm about to hit a milestone birthday, they're older than me. And for a power plant that's really old. So what happened though is, you know, you had rational economic responses and then the data centers came and it was the data centers that drove us from a condition of extra generations sitting around not being heavily utilized to a period where we are now short of our reliability targets starting in 2027.

And that is a fundamental change. And yeah, there's a ton of different reasons. Everything costs more. I hate going to the grocery store these days. Everything is more expensive. That's true in the electric grid too. But the data centers and the capa, the resulting capacity price increases are what really hit Maryland extremely hard.

PATNAIK: And you mentioned earlier in our conversation Delaware as well as an interesting example. Can you talk a little about Delaware?

SILVERMAN: Yeah. I'm really interested in this question about multi-state equity. So you have a lot of data centers coming in Virginia. It's data center alley, right? It is the greatest concentration of whatever in the world.

So they are using an incredible amount of power in Virginia, Pennsylvania has also recently gotten into the game and is attracting a lot of new data center, low growth, you know, who hasn't Delaware. In fact, they are actively fighting a large data center that's trying to come to the state largely because of these costs increase cost concerns.

But despite the fact that Delaware is playing no part in the problem. They are getting hit with the same cost increases that the rest of us are seeing.

PATNAIK: Interesting.

SILVERMAN: And this is where, you know, you get this kind of like fascinating coalition of political players where you have the president of the United States and Governor Josh Shapiro and a number of other, both Democrats and Republican governors and PJM talking about the idea that data centers need to pay their own way and that no individual, you know, grandma shouldn't be paying more because of the data centers.

And so it's been really interesting and we see it playing out right here in this region, right in PJM, where Virginia, you know, has an enormous budget surplus right now largely because of data centers and yet costs in Maryland and you know, as well as Virginia and Delaware are skyrocketing.

And so it's this really interesting question, how do we design a market that encourages economic development? 'Cause we want, that encourages data centers and the taxes that they bring without taking the costs of all this new infrastructure. And having it hit mom and pop consumers.

PATNAIK: I think you hit on a really interesting point, which is what is the counterfactual, right? Like we, we want economic development.

Economic development right now is in AI and not in, I don't know, manufacturing of nails or steel bars. And so the question is kind of how can we facilitate this in a way that doesn't ruin like private households at the same time, right? So Brendan, I wanna turn to you a little bit. Like historically when you had more load come on and more customers take off some of the load this system cost could be spread over a broader base of customers.

Do you expect this to continue or do we see differences now with the data centers that make this model a bit more difficult?

PIERPONT: Yeah I think the short answer to this is that it really all depends and it all depends on those market mechanisms, how they're structured. It all depends on. Utility planning processes and how they plan for this new load.

And it depends on how quickly we can sort of build the infrastructure needed and how cost effectively we can build the infrastructure needed to support these new loads. And so when I think that there's certainly a significant opportunity in the long run to better utilize the existing infrastructure that we have.

We have. We have transmission distribution infrastructure that might only be a couple hours a year that it's fully loaded and most of the time you might be using it on an average of maybe a 40% utilization rate. So some of that there's a large opportunity to move more energy through that same infrastructure spread those costs over more megawatt hours and reduce average rates, which I think is something that, that Ryan and his team found looking at historical trends of where there's growing load there's often falling rates, but I think that really is only if there is headroom on the system to do that.

And what that says to me is there's two strategies. There's find where there's headroom, which there's virtually none of it left in the US because I think where data center data centers have looked all over the US for opportunities to connect and I think soaked up a lot of the existing remaining headroom on the system and or create that headroom.

And so that's things like investing in energy efficiency across, not just at those data center sites, but across all customers. It's investing in things like virtual power plants and demand flexibility that can actually