Intro:

Hello and welcome to CleanLaw from the Environmental and Energy Law Program at Harvard Law School. In this episode, Dale Bryk, director of State and Regional Climate Policies at EELP talks with Jamie Van Nostrand, recent chair of the Massachusetts Department of Public Utilities, the entity that oversees investor-owned electric and gas utilities. Together they dive into the regulatory frameworks that govern utilities, how those rules drive utility investments, and what that means for consumer energy bills in the transition to clean energy. We hope you enjoy this podcast.

Dale Bryk:

Welcome to CleanLaw. I'm Dale Bryk, the director of State and Regional Policy at the Harvard Environmental and Energy Law Program. Today we're going to look behind the curtain of the clean energy transition and try to understand what's going on with our gas and electric utilities. We're going to try to demystify the arcane world of utility regulatory proceedings, clarify both market and policy drivers for clean energy investments, and explore how a relentless pursuit of safety, affordability, and reliability could actually bring about a much cleaner energy system.

To do that, we are so fortunate to have with us Jamie Van Nostrand, who until recently was the chair of the Department of Public Utilities for the State of Massachusetts since May of 2023. He was also a law professor for 14 years at West Virginia University, the executive director of the Pace Energy and Climate Center, and he had over 20 years of experience in private practice. And I can just say that Commissioner Van Nostrand is one of the leading thinkers on these issues nationally, and his work in Massachusetts is truly at the forefront of the industry, and I'm so happy that we're going to be able to dig into these issues with him today.

So Jamie, welcome to the podcast. It's so great to have you.

Jamie Van Nostrand:

Thanks very much Dale, and thank you for that really kind introduction. I hope I can live up to those glowing words.

Dale Bryk:

I'm sure you will. So let's start with the fundamentals. Can you help us understand just the most basic things about the utility business model? How do utilities make their money now on both the gas and the electric side, and why does that create issues with respect to affordability and transitioning to clean energy?

Jamie Van Nostrand:

Basically, utilities make money for delivering energy, whether it's on the gas side, the therms of natural gas on the electric side, electrons of electricity, they make their money by delivering it. The cost of the commodity itself is just a flow through. Where they really make their money is all the infrastructure that takes to deliver that gas and electricity. What are the gas distribution companies doing in terms of replacing pipe that are causing delivery costs to go up so rapidly?

On the electric side, we're looking at a rather substantial clean energy build out. As we decarbonize both the building sector and the transportation sector, we're looking at moving a lot more electrons around. That means more and more investment in transmission and distribution infrastructure. Those delivery charges on the electric side are probably going to be going up as well. That's really how they make their money is in that investment in poles and wires on the electric side, on gas distribution, mains on the gas side, that goes into their rate base and they earn a return on that. And that's pretty much how they generate their profits.

Dale Bryk:

And can you tell us how this has changed over time, the investment that the utilities are making in all those pipes and the system itself, versus just the cost of managing the system and passing through the commodity cost, the actual cost of the gas or the electrons themselves?

Jamie Van Nostrand:

So on the gas side, what we've seen particularly in Massachusetts with lots of aging pipe, what's been referred to as leak prone pipe, lots of investment by the gas companies in replacing that pipe, particularly over the last 10 years. And as a result, the percentage of your bill that consists of delivery charges versus the portion we representing the commodity charges or the gas itself, that's pretty much flipped. About 10 years ago, 2014, that number was about 70%, 65% of your bill was the commodity, the gas itself, and about 30% was the cost of delivering it to your house.

Most recently, that number is like 70/30. 70% of the cost is delivering it to you. 30% is the gas itself. Now, some of that gas costs have been relatively stable, but the delivery charges have gone up because the gas companies continue to invest vast sums of money frankly, in replacing pipe and just increasing the size of the rate base upon which they earn a return. It's problematic because we're seeing throughput go down. The number of molecules going through the pipes as people transition into electric heat pumps. And so the throughput goes down, the costs of operating the system don't go down. That results in upward pressure on bills.

Dale Bryk:

Right. And we're going to dig into that more. And when you're saying throughput, that means the therms and the electrons that are flowing through the system, basically our demand as customers for electricity and the gas side is going down. Because people are both becoming more efficient and transitioning to electric heat pumps. So that's a big trend that's happening in the system that we have to manage. And I want to get into that more in a second, but just another minute on this situation that we have where the utilities have a bias in favor of making large capital investments, investing in the infrastructure, the pipes and wires. Even when it might be much cheaper to do something else, to be investing in distributed resources, to be helping their customers invest in energy efficiency or heat pumps.

So when we have that bias, how do the utility regulators address that? You know that that's happening. So how can you push back on proposals from utilities that are not the most cost-effective investments, and are actually making energy less affordable for their customers?

Jamie Van Nostrand:

That's a big challenge for the regulators, frankly. On the gas side, what we've seen as the measures that the utilities are taking to address the leak-prone pipe or the aging pipes, there's a bias in favor of replacing the pipes and these pipes last for 50 or 60 years. Whereas in Massachusetts, the Global Warming Solutions Act, we have a net zero by 2050 goal and a Clean Energy Climate plan, which provides sector limits in terms of greenhouse gas reductions that we need to achieve. So we need to stop thinking about the gas system remaining in place in perpetuity, stop thinking about replacing pipes with 50- and 60-year assets, and thinking about can we pursue a lower-cost solution like we relining or repair, which is less profitable for the utility, but it's an operating expense. And so they don't own a return on an operating expense, they earn a return on the investments. And so when in doubt, the utilities tend to want to spend money on investments that will add to their rate base and upon which they earn a return.

On the electric side, we have the same issue in terms of, as you mentioned, distributed energy resources, which are batteries, solar panels, the battery in your electric vehicle. Those are all potential resources on the customer side of the meter that represent lower-cost solutions. The utility's bias is going to be let's spend more money on

reinforcing the grid, more upgraded substations because that's going to increase their profits. Whereas a lower-cost solution might be taking advantage of that flexibility of those customer-sided resources like using that battery on the customer side of the meter as a resource for the utility. The utility will not have to build as much stuff because they can take advantage of customer-sided resources. And so the challenge of the regulator is being mindful of making sure the utilities are pursuing that lowest-cost path for customers, which in many cases is not the most profitable path for the utilities.

And we try to do that by thinking about incentive mechanisms. Does it make more sense to promote a program that encourages virtual power plants or those batteries on the customer side of the meter versus additional investment in transmission and distribution infrastructure?

Dale Bryk:

So let's talk more about the pipe replacement issue. That's where we have the utilities replacing, like you said, leak-prone pipe. It's very, very expensive. The ostensible reason for that from the gas utilities is for safety that it's like we just said leak-prone, but it's not always actually leaking. And the plans for replacing pipe can extend over 30 years. So we're not talking about an urgent safety matter, but we are still talking about safety. At least that's the proposal from the gas utilities who are making these investments. So how do you approach that issue, both the cost and the safety issue for the pipe replacement proposals that the utilities are putting forward?

Jamie Van Nostrand:

In Massachusetts, ever since 2014 when the legislature passed what was called the Gas Leaks Act, there's been a program, the Gas System Enhancement program or GSEP, which pretty much allows the utilities for expedited rate recovery of these investments that they make when they're addressing leak prone pipe. They've been spending up to 3% of their annual revenues on this program. And it's like I said, there's been a bias to move towards replacement of those pipes, rather than looking at potential lower cost options like relining or repair, we had a major, what I would call a reset of that in an order that we issued at the DPU back in April, to scale back, the level of that spending, and pointed out that we don't want to be putting 50 and 60 year assets in the ground when maybe we just need to repair and reline and just extend the lives for a few more years.

Because ultimately we're going to be decommissioning lots portions of the gas system to achieve net zero by 2050. So move away from thinking that the gas system's going to remain in place in perpetuity and think about lower cost solutions that are going to merely extend the life of the pipes for a few years and then potentially decommission them. But at the same time, gas is dangerous, it's explosive, so we have to make sure the system's going to be operated safely. So as we reduce the level of spending, we had our Gas Pipeline Safety Division, which is incidentally one of the best in the country, get involved in making sure the utilities are more rigorous in their risk assessments.

So as the spending goes down in the GSEP program, we're making sure that the riskiest pipe is still addressed first. And so more rigorous risk assessment prioritization, then utilities have to show their work. Did you consider relining or repair as an alternative to replacement? Because that is a lower cost option for customers, it's going to help keep rates down and then it's going to make sure that we're not stranding all this investment as we shrink the gas system to meet the greenhouse gas targets that we're not putting that additional investment in the ground. Which ultimately is going to be paid for by ratepayers in all likelihood.

Dale Bryk:

And just to be clear, stranding the investment is a stranded asset where an investment is made and then it's not used for its whole useful life, and then we never have the resources to pay it back in just our normal energy bills the way we pay them. And now it's just a huge debt that's sitting there, an asset that we're not using anymore.

Jamie Van Nostrand:

Correct, yes. Otherwise, if your throughput's going down and your fixed costs are staying the same or even going up as they continue to invest in additional capital investments in the system, then it's going to just have massive upward pressure on rates, and that's what we're trying to prevent.

Dale Bryk:

And can you give a sense of the scale of the cost here? I know in New York the proposed expenditure is $150 billion over many years for replacing the pipe. But what's the ballpark cost and the savings that you could get from relining? The relining is only a fraction of the cost, correct?

Jamie Van Nostrand:

The numbers in Massachusetts, since the Gas Leaks Act was passed, were probably upwards of $5 billion has been spent. And I think of the utilities under their proposed GSEP plans before we did the reset, we're probably going to spend another $15 billion over the next 15, 20 years to address all the leak-prone pipe. I think what we're seeing with relining and repair, frankly there just has not been enough attention devoted to it. Really not enough research and development because there hasn't been much incentive. A lot of the gas utilities around the country are in the same situation of having these enhanced rate recovery programs to address leak-prone pipe. So there's just been this default to just replace the pipe.

And what we kept hearing in Massachusetts was relining or repair, that's only going to delay the ultimate replacement of the pipe. And that's just not the way we need to be thinking about these things. If we can just extend the life for 10 or 15 years and then think strategically about shrinking the system by maybe electrifying houses, decommission the pipe, rather than spending the additional money to replace the pipe, that's going to represent a lower-cost solution for customers and it's going to avoid those stranded costs.

Dale Bryk:

So let's think more about shrinking the system and what that would look like and the obstacles that are preventing us from doing, for example, in instances where it might be cheaper not just to reline the pipe but actually to decommission the pipe. Because the investment that you would be making in the natural gas distribution system infrastructure is much more expensive than it might be just to electrify the buildings that are at the end of that portion of the system right there. But there are regulatory barriers to doing that. And two of them are what we call the hundred-foot rule. The rule that allows utilities to basically socialize the cost across all customers when they're going to extend a line to a new customer.

And the obligation to serve, which is a legal obligation in many places in statute that the utility must serve the customers in its service territory with gas. So that creates a huge challenge for doing just what we're saying, electrifying a slice of the system, downsizing the system when that is the most cost-effective option. And maybe also the best option from a safety and reliability perspective.

Jamie Van Nostrand:

Yeah, there's a couple of different elements to that. The line extension that's really... are the gas companies going to provide an allowance if we give a new customer hookup? Let's just give an example that customer hookup is going to cost $10,000 to extend the pipe to serve a house. The gas utility would typically provide an allowance towards that, maybe $8,000 of the $10,000 based on assumptions about how much gas has been going through the pipe and whether the customer's going to have a gas furnace for how many years.

And so it's generally been calculated by the gas companies in a way to generate fairly generous line extension allowances, right? Because they're encouraging additional hookups. As Dale you mentioned in New York, there's

actually in the statute a hundred-foot rule, the first a hundred feet is free. When the legislature passed a bill to eliminate that, I believe it's still waiting for the Governor Hochul whether or not to sign that. In Massachusetts in August, we adopted a policy still subject to some further discussion to basically eliminate line extension allowances.

In our mind, it doesn't make sense when you have aggressive greenhouse gas reduction goals to continue to invest in expansion of the system. It's merely a way of existing customers having to subsidize the addition of new customers, and just eliminating those allowances would save gas company customers about $160 million a year.

Now the obligation to serve, that comes into play when we're looking at potential non-gas pipeline alternatives or NPAs, we call them. In the order that we issued in December of 2023 in our Future of Gas docket, we instructed the gas companies you need to consider whether there's a non-gas pipeline alternative. Is there a cheaper path that doesn't involve additional investment in infrastructure as a way of fulfilling your obligations to continue providing service? And that example you gave, if you think about a subdivision at the end of the line, maybe you've got 30 houses in that subdivision and maybe you're looking at half a mile of pipe, potentially leak-prone pipe. It may be cheaper to say, let's decommission that leak-prone pipe and let's electrify all these houses.

And that way we're going to save the money by not having to address the leak-prone pipe. And we're going to instead, electrify and eliminate those costs of operating the system for that half mile of pipe. And what happens with the obligation to serve you've got 30 customers, well maybe 28 of the customers. Sure, I'm in on that. I'm ready to electrify, I'm ready to take out my gas first. You got maybe two customers that are potentially are holdouts who say, no, I like my gas. You're not going to take away my gas. And what the gas companies in Massachusetts are saying now is based on the obligation to serve, it's all about the customer choice. And if two customers say no, then there will be no decommissioning. And so that's a serious barrier to actually shrinking the system.

But right now, the LDCs, the gas companies are citing the obligation to serve. Citing it's a matter of customer choice and that's preventing achieving any decommissioning of the pipe. So it's a huge barrier. The DPU, shortly before I left, we issued a hearing officer memorandum in the pending dockets to basically tee up that issue of the obligation to serve. Is it the statute says gas or electric, does that make a difference? What about the public interest? What about achieving greenhouse gas reductions? What about avoiding stranded costs?

Thinking about the customer choices, you've got 28 of those 30 customers who want to electrify. Why do the two customers who don't want to electrify, why can they thwart the choice of the 28 who do want to electrify? So you can't just say it's customer choice and those who want their gas can't have it taken away. It needs to be a broader evaluation of the public interest. So the commission teed all that up and the parties filed some very insightful comments in that, and that'll be up to the currently constituted commission to figure out what to do with that.

Dale Bryk:

So in Massachusetts, it could be that the obligation to serve is interpreted in a way that it's the obligation to serve heat. You said it could be gas or electric. As opposed to the obligation is only very specifically to serve therms of gas.

Jamie Van Nostrand:

Correct. And there were some pretty significant changes made to the governing statutes in the 2024 bill that talked about the substitutability of other sources of energy instead of natural gas. That's part of the consideration. And also talked about non-uniformity of service, that the utilities could basically vary the type and quality of service. So we think there's an opening based on what the provisions were to the statute that says that utility is providing the essential service of energy or heat. It doesn't need to be natural gas if electricity is an adequate substitute.

Dale Bryk:

And can you say a bit more, you hinted at this earlier about what are the ramifications if we don't address the obligation to serve, and we don't start shrinking the system in an intentional methodical way that is really identifying the most cost-effective path forward. Given not just the state's clean energy goals, but just what's happening in the marketplace as customers transition to heat pumps, whether states have incentives for them or not, this is happening nationwide. Then as you say, the throughput is going down, the demand for gas is going down. That's what the throughput is. So there's less and less demand, but we still need to maintain the same system. So just tell us more about where we're headed if we stay on this road.

Jamie Van Nostrand:

Well, the fact that those numbers have flipped from being 70/30 commodity versus delivery to now 70/30 delivery versus commodity, that's just going to continue because we don't see much change in the commodity price of gas. It may go up a little bit because of the LNG exports that we're now doing, but those delivery costs are going to keep going up, and that throughput is going down. I think in Massachusetts over the last five years, we've got maybe 90,000 air source heat pumps have been installed. So the point is the transition is underway.

There's been a lot of technological developments in terms of efficiencies of electric heat pumps and customers are now choosing to go with electric heat pumps. So the demand for gas is going down. The transition is underway. The question is whether it's going to be a managed transition. A managed transition says we need to shrink the system as the throughput goes down, otherwise the rates are just going to continue to escalate and even more dramatically I think, than they have given the number of decline in demand for gas so far just as people move to electric heat pumps.

Dale Bryk:

And what does a managed transition look like? I've heard you a few times say, we've got to get the maps out. What does that mean if we have the regulatory framework to drive the smartest investments on behalf of the utilities and customers, what does that look like, and what do we need to do to support that managed transition?

Jamie Van Nostrand:

The big thing that comes out of looking at shrinking the LDC system is what's called integrated energy planning, where you've got the maps in terms of there may be a logical place for a gas system to be reduced by taking out some leak-prone pipe at the end of the line, so to speak. If you're going to electrify all those houses to be able to decommission that pipe, does the electric system have the capability of taking on that additional load? Because you're looking at more electric heat pumps. So it needs to be coordinated. But I think managing the transition means you take that longer view that looking at where the leak prone pipe is, looking at opportunities for shrinking the system in terms of the pipes at the end of the line, so to speak.

And maybe you're not going to do it this year or next year or five years from now, but you're going to be thinking seven, 10 years from now and you start putting customers on notice. Don't buy that new gas furnace because seven, eight years from now we're going to be decommissioning the pipe here and converting and electrifying your home. So it's basically taking the long view and just looking at opportunities to shrink the gas system to be able to decommission the pipes and avoid those costs of continuing to maintain the pipes, and then make sure the electric companies can take on that additional load. That's going to be the lowest cost path for customers.

You really can't afford to maintain both systems. The transition's clearly underway, and we need to provide the cost-effective solution for customers, and that's primarily through decarbonization, electrification.

Dale Bryk:

So that's a great segue way to talking about how we do more integrated gas and electric planning. You said that word yourself, but I think that's a foreign term to many. And historically we've had quite separate planning for the gas side and the electric side. And I think on the electric side, we do have a long history of long-term planning, not so much on the gas side. For many years it's sort of like, how are you going to keep the heat on this winter? And it's really just an annual look versus the long-term planning that you're talking about. And to have some utilities are gas and electric combined, others are separated even when they're combined. The service territories don't overlap entirely. So it's not without challenge. But it hasn't even really been attempted in a lot of places.

So you're highlighting the need that if we're going to have this transition, more and more customers are switching to electric heat pumps for space heating and for water heating. How do we ensure that balance and equilibrium across the two systems as one is declining and one is increasing and they don't have a long history of doing that planning together and you have sort of uncertainties on both sides?

Jamie Van Nostrand:

Well, the fact is those utilities, even when you have utilities that provides both gas and electric, oftentimes those divisions don't really coordinate or talk to each other. So it's completely different planning model. So just within a utility that operates both gas and electric, being able to combine those operations. And I think we're seeing those developments at National Grid and Eversource in Massachusetts. You're seeing folks who are now taking on the role of integrated energy planning where you're going to get those divisions talking to each other. I think the more challenging situation is where you have a customer who might be getting their electricity from Eversource and their natural gas from National Grid. That's a much more complicated situation. Or we have in Massachusetts, we have a couple of standalone gas companies, Berkshire and Liberty, all they do is provide gas. They don't have an electric division.

So it's very complicated in terms of maintaining the financial viability of those gas companies, making sure the system continues to operate in a safe manner. But one of the things that the DPU did in that December 2023 order in the Future of Gas docket was require the LDCs, the gas companies to come in with electrification demonstration projects by March of next year. Show us where you're going to decommission part of your service territory, and you have to bring in your electric distribution company with you because we've got to make sure that electric company can take on that additional load.

So we're starting down that path and National Grid filed last December an electrification demonstration project for Leominster and Winthrop that looks at 118 customers on 14 segments and basically looking at potential for decarbonization by electrifying those homes and then decommissioning the pipe. And National Grid highlighting the obligation to serve, as you said. And if we can't find any one of those 14 segments where all the customers agree, then we won't be decommissioning any of those pipes. Highlighting the fact that in order to decommission any of those segments, there has to be 100% agreement by all the customers served by that segment. And so we'll see how that plays out, but it really highlights the fact that if we can't address the obligation to serve issue and the substitutability of electric for gas, it's going to be very difficult to achieve when you're decommissioning.

Dale Bryk:

Yeah, it's interesting that you're seeing everything that we're talking about is being reflected in real life, in real time in the plans that some of the utilities are putting forward. How do you think about the utility business model and how that has to change over time, and even is maybe starting to change in some places now? This is a 25-year transition, it's not happening tomorrow. We do need to maintain, of course, the integrity of the system, safe, affordable, reliable energy all the time, but what is the future for the gas utilities? You can imagine

that if you are a gas and electric combined, you're kind of eating your own lunch. And even if they're distinct companies with distinct leadership, that's a less challenging situation than for the standalone gas utilities.

What is the future of their business model? Are they manufacturers of rotary phones that are just not going to be needed anymore? Or is there a future business that they can sort of segue way into as they go down this road over the next decades?

Jamie Van Nostrand:

One of the exciting things in Massachusetts is the ability of a gas company to transform itself into a thermal utility. And Eversource has a really interesting project in Framingham, about a 135, 140 homes on a couple mile loop that are now served by network geothermal. I've toured that project and basically you've got lines running down the middle of the street and laterals out to houses, much like what gas companies do, except instead of natural gas going through the lines, it's geothermal fluid basically. And then the ground source heat pumps then within each individual house. And instead of having a pipeline delivering gas, you've got boreholes to be able to access this constant temperature ground at 600 feet down and you have a pump house to be able to move that geothermal fluid around. So there are opportunities, and Eversource has filed a proposal for network geothermal for new construction.

So a new subdivision going in rather than having a gas pipeline delivered to it, let's look at whether we can have ground source heat pumps with a geothermal loop within that subdivision. So there are opportunities to transform into a thermal network company. And the good news about that is it's great opportunities in terms of workforce transition. When you look at job opportunities for existing gas company employees, it's a good transition because the work is very much the same. It's just different products being delivered to the homes. But it is very challenging in terms of, as you say, for a combination utility that has both gas and electric, you're going to sell more electric and less gas. And the overall profitability, you can probably figure out ways of maintaining that overall profitability.

For the standalone LDCs, it's going to be more of a challenge and you need to be looking at those opportunities to think about getting into the thermal network business. But thinking more generally about you're providing the business of energy of heat and not just one fuel versus another.

Dale Bryk:

Right. So if they think of themselves more as a heat utility then they have a lot more business opportunities in front of them.

Jamie Van Nostrand:

Yeah. And the governor's affordability bill in Massachusetts contains some measures to really try to address those upfront costs of network geothermal and give opportunities for potentially reducing the cost of financing that infrastructure. But just to try to open up the opportunities for competitors to come in and frankly, for gas companies to think about becoming thermal network companies.

Dale Bryk:

Great. Let's shift over and talk more about the electric side of the equation. And we talked in the beginning about the bias that all utilities have in favor of capital expenditures, investing in infrastructure, and I want to understand how that plays out on the electric side where the context is completely different, right? We're looking at a place of dramatic growth and we should talk about how dramatic and the drivers of that growth. But how do you see that bias playing out? Are there the same challenges with respect to affordability for customers and transitioning to cleaner resources, or is it completely different for electric utilities?

Jamie Van Nostrand:

The challenges are very similar. I mean, we're basically expanding this additional investment in the system to be able to deliver more electrons. Because we're talking about decarbonization of both the building sector. So you're taking out the gas furnaces, you're replacing with electric heat pumps, whether it's ground source or air source. And then you're talking about decarbonizing the transportation system, which means electric vehicles and car chargers. So it's just a matter of scaling up the distribution system, being able to deliver more electrons.

Dale Bryk:

And we should add the rise of the data centers and the demand that is projected, which we should talk about from them as well. So it's at least those three things, right? Electrification of buildings, electrification of transportation, and data centers. Three big drivers needing more electricity.

Jamie Van Nostrand:

Yes. And in Massachusetts, the legislature in 2022 required the utilities to file electric sector modernization plans. So that's basically what the electric companies are planning to spend over the next five, 10 years. How many additional substations is that going to require? How many upgraded substations? What does that investment look like? And then our job as regulators is to make sure that the utilities are not over investing, right? Is there a lower cost solution for delivering that additional energy? And that's where the virtual power plants, which is pretty much anything on the customer side of the meter, whether it's solar panels, whether it's a battery on the customer side of the meter. Whether it's the vehicle to grid if you have an electric vehicle, having that resource available for the utility to call upon.

Are there lower cost solutions by encouraging virtual power plants? They're also generally known as non-wires alternatives. In other words, it's anything other than the default solution is, well, let's just build more poles and wires, let's have more substations. And that's additional investment that goes into the rate base and the utility earns a return on it. That's pretty much the default path. The job as regulators is making sure that they're not building any more transmission distribution infrastructure then is absolutely necessary. Taking advantage of non-wires alternative solutions, and if there's a lower cost path for customers pursuing that path. So I think one of the things the commission will be looking at this fall and into next year is trying to align the incentives for the utilities to pursue that lower cost path for customers, and address that capex bias.

So the default isn't simply to build more transmission and distribution infrastructure, but to look at non-wires alternative solutions to take advantage of technology. And I think one of the metrics the commission's going to be looking at is it's kind of wonky, but it's asset utilization ratios. If you're building something and it's only being used 10% of the time, maybe there was a non-wires alternative that could have been used that would've made that transmission and distribution infrastructure investment unnecessary.

So just starting to track those metrics because that's a good way of making sure there's not overbuilding going on, and that utilities are taking advantage of technology to pursue the lower cost path of a non-wires alternative. Drawing upon that customer sided battery, drawing upon the vehicle to grid if the customer has an electric vehicle to be able to take advantage of that. And solar panels, it's all basically using all those resources in a cost-effective demand to hold rates down for customers.

Dale Bryk:

So asset utilization rates, can you give us an example of an asset, something that a utility would invest in that then wasn't really used that much and turned out not to be the smartest thing to invest in? And is there any way of figuring out that in advance, or you need to sort of learn by doing and say, "Hey, you just built one of those and now we can see it wasn't really used that much, so why is this one going to be a better deal for customers?"

Jamie Van Nostrand:

It's really just looking at load factors by circuits. And the default solution would be, well, this load factor is growing, we need to make some additional investment to reinforce that circuit. Well, maybe there are things on the customer side of the meter by taking advantage of a battery storage at a customer's house, or distributed energy resources in the terms of solar panels, to avoid that additional investment. You just watch that load factor, and if that load factor is going down, then that means that that investment's being used less and perhaps that was unnecessary. Maybe there was a non-wires alternative.

So in order to keep costs down, we got to be seeing those asset utilization rates going up. Because just because we're delivering more electrons doesn't mean rates need to go up. We need to use the system smarter. And frankly, time varying rates, when those come into effect, you know, in Massachusetts, we're in the process of rolling out Advanced Metering Infrastructure or AMI, that's going to allow smart meters to be installed. So we're going to be starting to roll out time varying rates. So customers will have an incentive to use electricity during off-peak times. Like the middle of the night you come home and you plug your car in and then have with time varying rates, have a smart meter to be able to charge that car in the middle of the night when power prices are low.

To be able to move that load around. But that means you're using more electrons. But if you're not having to build more T&D infrastructure to move those electrons around, then that has a downward pressure on rates. You're just using your existing investment more efficiently.

Dale Bryk:

So you're talking about truly smart meters that are not like I'm just getting a time of use rate that tells me in my bill that I should use my appliances at this time, versus that time. But more something, I mean, I think people are familiar with your phone battery, your phone battery learns how to charge in a way that's good for your phone. So it's like charging at a certain time. You just leave it plugged in, you're not paying attention, you're going to sleep or making dinner or whatever.

And if we had a truly smart meter system, it would enable orchestration by a grid manager who's taking advantage of the battery that's in your car, the solar panel that's at your house, the intentional orchestration of resources on the grid manager side, which could be the utility or could be somebody else. Which is not what we're doing now where people have batteries in their cars, they're not being used to support the grid.

Jamie Van Nostrand:

Yeah, you've talked about a couple of different levels there. But yeah, in terms of the grid operator being able to take advantage and just sort of managing the load on a circuit, knowing which homes have electric vehicles, which homes have heat pumps. Making sure those cars are charged, not at the same time, you can rotate that. But you can manage the demand on the system in a way that's going to minimize having to build additional T&D infrastructure.

And then within the home, I think there's a role for artificial intelligence, that interface. We're going to be with the rolling out of time varying rates, we're going to be focused on sending price signals to customers and expecting the customers are going to respond to those price signals by managing their peaks. And I think a lot of customers are going to say, I really don't want to screw around with that. I want to plug my car in when I get home and not have to worry about it. Well, I think with an AI interface, a lot of these things will be going on seamlessly. The customer won't even be aware of it.

You plug your car in when you come home and then the interface will tell you, okay, we're going to charge your car at two o'clock in the morning when power prices are lowest. You don't know that that's going on. You don't know that it's adjusting the thermostat on your heat pump and various things that can do in your house. But it's

basically taking advantage of the price signals, lowering the customer's bill and reducing the peaks on the grid, so that we don't have to build as much stuff.

So there's a lot of things that technology is going to enable, and as we roll out this AMI, the Advanced Metering Infrastructure and the smart meters, making sure that all this works together and that's digitalization, it's interoperability. Those are the terms that come into play, but just making sure that those AI interfaces that a customer might have to manage all these things in his home, work together with that smart meter that the utility is going to be installing. Because these are additional investments that ratepayers are going to be paying for to upgrade the grid, and the benefits need to exceed the costs, otherwise those investments are not necessary.

And so in order for the benefits to exceed the costs, all this stuff needs to work together and customers need to be able to respond to the price signals that we're sending them. And if they don't feel like making the effort themselves, that it's really happening on their behalf through technology.

Dale Bryk:

Well that sounds like a future that we could all look forward to. And thank you so much for helping us understand what's going on behind the scenes in the world of utility regulation that could really help drive the utilities to do their part, to create that system for us. I don't want to leave without you telling us what you're going to be up to in your next adventure, now that the citizens of Massachusetts aren't going to have you at the helm of this enormous undertaking.

Jamie Van Nostrand:

Oh, I'm glad you asked Dale. So actually as of Monday, I became the policy director for the Future of Heat Initiative, which is an organization, it's only been in existence for about a year, but we're working very much on that natural gas transition. I think the work that we did at the DPU over the last two and a half years that I was there, I think we've established Massachusetts is probably the number one state in the country in terms of the natural gas transition. But a lot of other states are working at it. And obviously as we talked about, the trends that we've seen in terms of delivery costs going up, that's happening nationwide.

That flip in terms of delivery versus commodity is happening throughout the country and the transition of people going to electrification is happening. And so it's basically helping regulators and their staffs recognize that this is an issue that urgently needs to be dealt with. If we're looking at affordability, we've got to start tackling these issues. So I'm excited to be working with the folks at the Future of Heat Initiative and working with other commissions around the country.

Dale Bryk:

Well, I know your fellow commissioners have been relying on you for advice and guidance and lessons learned during your entire tenure here. So it's great to know that now it'll be your full-time job to help them tackle all these amazing opportunities as well.

Jamie, thanks. And hopefully we'll have you on again and we'll hear how your progress goes in that work ahead.

Jamie Van Nostrand:

Thanks, I look forward to it. Thanks, Dale.