

Abby Husselbee:

Welcome to CleanLaw from the Environmental and Energy Law Program at Harvard Law School. I'm Abby Husselbee, a staff attorney with the program, and today I'm joined by Michael Stoddard. Michael is the executive director of Efficiency Maine Trust. As we'll discuss in this episode, the Trust is Maine's independent administrator for programs that promote energy efficiency, alternative energy resources, and carbon savings. Michael also serves on the Maine Climate Council and is the co-chair of the council's working group on buildings, infrastructure, and housing. Michael was formerly senior council at the Acadia Center. Thanks so much for being here today, Michael. I'm really looking forward to the conversation.

Michael Stoddard:

Me too. Thanks for having me.

Abby Husselbee:

One of the reasons I'm so excited to have you on CleanLaw, is that Maine has been doing an incredible job at building electrification, and just to give our listeners a glimpse into what I'm talking about, in 2023, the governor announced that Maine was two years early in surpassing its goal of installing 100,000 heat pumps, and upped the goal to 275,000 by 2027. Now, that update was in 2023, so I'm sure you've made some additional progress since then. And along with that, the share of residents using home heating oil in Maine has fallen quite dramatically in recent years. I'm really looking forward to hearing more about how your programs work, why your approach has been successful, and what's next for the Trust. Before we get into your programs though, I thought it might be helpful to learn a bit about the heating fuel mix in Maine.

You're dealing with some unique challenges, and perhaps opportunities. Maine has cold winters that require reliable heating equipment that works at very low temperatures. So just to orient our listeners a bit, can you talk briefly about the current and changing heating fuel mix in Maine?

Michael Stoddard:

Yeah, sure, I'd be happy to. Starting in around 2010, the census data showed that more than 70% of homes and businesses in Maine heated their spaces with heating oil, or number two distillate fuel. Another 10 to 15% use propane. So mostly fossil fuels, and those are both delivered fuels. They don't come to your house through a pipeline like natural gas does, they have to be put in a truck and brought to your building. Today, it's down to about 50% of homes are reporting that their primary heating system is heated with oil. So there's been a significant decline in the last 15 years, from heating oil to other things. It's still a very significant number, it is the highest percentage of any state in the country, but it is changing gradually, and people are moving to much more electrification, as you mentioned, and also to other sources of fuel, like propane.

Abby Husselbee:

So with this heavy reliance on delivered fuels, I think it would be great to learn a bit more about how you see the drivers, or the why of your programs, what's motivated the policies and program that Maine offers. Why is the Trust working to accelerate the market for heat pumps and heat pump water heaters?

Michael Stoddard:

Well, there's no one single reason, it's a collection of multiple reasons. To be sure, Maine has struggled for much of the last 40 or 50 years, with its heavy, heavy reliance on imported fuels. So whether it's heating oil, which is what we've mostly used, or natural gas, the fact that it's not made here, in fact, it's not made anywhere close to here, it's all brought in from very far away. Means two things, number one, by the time it gets here, the price is a bit higher, it had to travel a long distance, and that means there's a higher cost to pay for that transportation. So it's always been a little bit expensive. But number two, especially with regard to the heating oil, it is subject to whatever is going on in global politics. And ever since the OPEC embargo in the '70s, and leading all the way up to the invasion of Ukraine, those fuels that are being imported are getting yanked around, whipsawed around, in the prices that we have to pay.

So when your whole economy, all the businesses and all the schools and all the local governments and all the homes, are dependent on these imported fuels, you're really at the mercy of what's going on in the world. And so they've been sort of volatile prices, and they've been pretty high prices. So there's a lot of motivation just to try and insulate ourselves from those high and volatile prices. That's number one. Affordability has really been the key driver.

Obviously, we're very concerned about environmental impacts also, and that's always been the case, but there weren't a lot of good options. Now that you have a variety of much higher efficiency heating systems, and using cleaner sources of energy, people have options, for the first time in a meaningful way, in this very cold climate. So I think that's another big driver, is trying to move to fuels that are cleaner and more sustainable. I think those are the key things.

Abby Husselbee:

That's really helpful context, thanks. And then because you're running incentive-based programs, I imagine the why is equally relevant on the consumer facing side. So do you have a sense of what is motivating both customers and the supply chain, to move towards heat pump technologies?

Michael Stoddard:

Yeah. So number one is affordability, people want to take control of their energy costs to the best they are able. And so switching to these heating and cooling systems that are not dependent on these imported fuels, is a big first step. And they also are motivated to have more comfortable spaces to be in, whether you're in a classroom, in a school, or whether you're in your living room, the ability to have heating and cooling directly in that space where you are located, is a nice improvement over a lot of the homes and spaces that are in our state. So I think comfort has been a big driver. Again, the environmental and health advantages to things like a heat pump system, there's no combustion in the building, there is no emissions of any kind of pollutants in the building or around the building. So that's something that people are really keen to see.

And then I think, between the customer and the product, is this whole supply chain, and that's a really big piece of the equation that I don't want to overlook. They play a huge role, and of course, the manufacturers are cranking out these widgets and they're excited to have growing markets for their product. But I think the small businesses in Maine have jumped at this opportunity to really make some money and do some good and serve their customers. So a lot of very entrepreneurial small businesses have gotten very involved in marketing heat pumps, and selling and servicing heat pumps, and they've grown their workforces tremendously, they've trained them up, they're making very good wages. So I think we've been really lucky with the number of small businesses that saw this as a business opportunity, and got into it.

Abby Husselbee:

That's amazing. And yeah, it sounds like there are a lot of factors really converging to help bolster your success there. With that, I'd love to talk some about the basics of your program mechanics, and what your programs look like. You have a really robust set of programs promoting both heat pumps and heat pump water heaters for both residential and commercial use, as well as a suite of energy and efficiency incentives. Starting at a high level, can you paint a picture of some of your key residential electrification programs? If I were a Maine resident looking to install a heat pump in my home, what might that look like?

Michael Stoddard:

When we first started these programs back in 2012, we started small and we started really simple, and we were just trying to get customers interested at all, in using heat pumps to provide some heat to their home. And in Maine, the easiest, simplest way to do that at the lowest cost, was to encourage people to add what we call a mini split heat pump. So it's a single outside compressor, and there's a thin line set that is insulated that runs into the house and it goes into the room that you want to put the inside heat exchanger into. And that's that thing that you see up against the ceiling, up high on the wall, usually. And so there was an outside unit and an inside unit and a little bit of piping in between them, and you could originally get that installed for a few thousand dollars in Maine, 12, 13 years ago.

That had the benefit of bringing air conditioning into that room. And a lot of Maine homes either did not have air conditioning previously, or if they did, they had the good old-fashioned, what we call window shakers, the window air conditioning units. They're very inefficient, they're very loud, and they're a big pain in the butt to move in and out to put away for storage in the winter. The heat pumps can do that for you, but most importantly, they can generate heat extremely efficiently. And so to the degree that you're able to use that heat to displace running your central boiler, or your furnace in your home, you could save a bunch of money too, because it was going to heat that room for you, and take the load off of your central boiler so you would burn less fuel in your boiler. That is what we grew into a program that you reported a moment ago, led to putting in more than 100,000. Really, we've now gotten well over 150,000 of those units installed around the state.

About two years ago now, we made a shift and said, "It's time to make this shift where, instead of just promoting people to put in these single heat pumps as a supplemental heating system, it's time to jump to making them your primary heating system for your home." And the way we want that to happen, is we want this to be a system of mini split heat pumps, if you need more than one to heat your whole home, or if you have a ducted distribution system within your home, you turn off your furnace and you would just replace it with a big heat pump to feed the central ducted system. But either way, we want it to produce enough heat, and to be able to distribute that heat throughout the whole home, so that this becomes your primary heating system. And not just for summer air conditioning, and not just for the shoulder seasons in the fall and the spring, but year round, this should be the thing that you use, so effectively you can just turn off that old boiler that was burning whatever fossil fuel you were using. And that way we can be assured that the heat pumps are going to perform to their full capacity. Depending on where your listeners live, they may not be familiar with the way most of the homes in Maine distribute heat around the home.

Most homes here, and I think this is true throughout a lot of New England, especially rural New England and the Northeast, we use radiators that have forced hot water being pushed in a loop throughout those radiators. That's how the heat gets into each separate room. Right now, there aren't a lot of good heat pumps that will efficiently and affordably get the water hot enough to make those radiator systems work well. Part of our success is that the contractors are willing to do that and the customers are willing

to put those into the individual rooms of their homes. So we're really pushing people to get a big enough system of multiple mini splits, or one big central ducted system, so that they can turn off their old central boiler and just let the heat pumps provide their heat.

The incentives that we provide are a fixed price per unit of heat pump. So if you just got one, you'd get \$1,000. If you bought two, you'd get \$2,000. If you got three, you would get \$3,000, capped at \$3,000 per home for most folks. If you're moderate income, in the moderate income bracket, we'll double that, and if you're low income, we will triple that. So we have this tiered system of incentives, to make it more affordable for folks who have less disposable income to put towards the cost of installing these units.

In especially some of the more rural homes in our state, and they tend to be a little bit smaller, most folks can cover the entirety of their home with just two heat pumps. We've tried mightily to keep it as simple as possible, to reduce as much friction as possible from the transaction. Because people are busy, they got busy lives, they don't want to become experts on heating systems. They've heard of this thing, their friends and neighbors have used it and liked it, they want to get one too. So we try to make it extremely simple, there are not a whole lot of rules, there's not a whole lot of restrictions, and we have a very robust website with information to help them take those first steps. Essentially, our first and most important step is to get them connected with a contractor who does this kind of work in our state. We have a list on our website of every contractor in the state who is registered with us, and there are more than 700 in the little state of Maine, who have signed up and registered to provide that service. And that also means it's easier for them to get a couple of price quotes so that they can try to get some competition in the services being offered to them, and they can keep the prices affordable, and that's very important.

So we encourage people to, either through our call center or through our website, find some of these contractors, get in touch with them. The contractors will come to the home and give them a free price quote, so they can know right away what they're looking at for a cost, and when they could get scheduled. And there's not a lot of rules after that.

So we have found, is part of our secret to success, is keeping it really simple so people don't get bogged down in tons of forms they have to fill out, and paperwork, and waiting a long time, because nobody really wants to wait for these kinds of services.

So that's the core part of our residential heat pumps. And we have something quite similar for commercial buildings, although there are so many more shapes and sizes of heat pumps that can be deployed in commercial buildings.

Abby Husselbee:

I really like that focus on simplicity of access for the residents, I can see how that would be really important. I want to pick up on a couple of threads that I heard there, one of which is contractors. Obviously you need contractors who know how to install heat pumps, that can do it well, that will be available when people need them. Can you talk a little bit about your process for building up your contractor network, and what it looked like to get those 700 contractors ready and available and registered with the trust to do the work?

Michael Stoddard:

I'm happy to talk about that. I think our perspective on this at Efficiency Maine, is a little bit different than perhaps what the conventional wisdom is. I think the conventional wisdom is that you need to have a bunch of training sessions, make sure people are certified, qualified, run them through a bunch of hoops, maybe encourage them to get into the business. We did it a different way, we made it lucrative for them to provide their services. We created demand and we focused all our effort on getting

the customers jazzed up about this, and demanding it. And they, the business community, responded to that opportunity. They grew, they went out and figured who they needed to recruit and hire, they figured out what training was needed to be able to responsibly perform these services. There's all kinds of resources just within the supply chain, for them to get the training that is needed.

The manufacturers will come to your state and provide training, if they know contractors are interested. What we call the distributors, which are sort of the wholesale part of the supply chain, that's where all of the equipment gets sent from the manufacturers, and that's where the contractors go to pick up the things to put in their truck or their van.

The distributors have classrooms set up, they will host contractors to come and get a training on a particular piece of equipment, or a particular brand, and everything from how to fix it, how to maintain it, how to install it, all the tricks of the trade. So there's a lot of training that is going on in the supply chain, before we ever showed up and made any suggestions about what would be important.

We have been fortunate in our state to supplement that with a variety of other training programs. So the community colleges in our state, several of them are very engaged in providing week long trainings and certifications for folks who think they want to get into the HVAC space, and doing heat pumps. They have labs, they have set up a bunch of heat pumps, and they can take them apart and put them back together again, and experiment, and practice with installing them and repairing them, and that's been a great resource. And our state government has also established a clean energy partnership, which is a program to help recruit more people into this space, and provide some trainings where we find gaps. So we've got a lot of things going on with workforce developments, that have really helped us. But I think the number one first and foremost driver, has been just creating market demand.

Abby Husselbee:

You've talked about the fact that Maine has a large number of homes on delivered fuels, which can be quite expensive in comparison to electricity from a heat pump. Do you have strategies to think about targeting households that might see immediate bill relief, and how does that fit into your market building strategy?

Michael Stoddard:

Well, I think the first point to note, is that a lot of the marketing for heat pumps in our state is conducted by the small business community. That the contractors themselves are out there pounding the pavement, they are advertising on radio and in print and on television. So it's in their own interest, and they're motivated and they know their business and they know their customers.

Abby Husselbee:

Do you see yourself having an active role in marketing or targeting to households that are currently on delivered fuels, that might see some affordability benefits in the very short term, to switching from their delivered fuel to a heat pump?

Michael Stoddard:

Initially, there was such a high percentage of homes in Maine that were on delivered fuels. We didn't really have to do very much targeting, because any general broadcast media or marketing we would do, would likely land on somebody who was a good candidate for a switch to heat pumps. So in the early days, we really were just doing media across the board, to everybody. And we've gotten quite a bit more targeted. We do a lot of online advertising, that is very targeted for anybody who's searching for information about heating systems. That's a pretty cost-effective way to get to people, a fair amount of

social media as well. We're generally avoiding some of the areas where there's a lot of natural gas infrastructure, because that, to your point, that is not the first line of customers that we think are going to see the most economic benefit.

So we got to get out to the rural areas, we got to get out to the areas where we know folks are on these delivered fuels. But we haven't had to do too much ourselves because, as I said, the contractors have figured out where the customers are who will stand to benefit the most, and they're really out there pounding the pavement themselves, with marketing and providing quotes on projects.

Abby Husselbee:

And then one more targeting question. Do you have different areas of focus, or maybe different strategies when it comes to working across new construction, versus maybe buildings that are being retrofitted with heat pumps? Are there cases where you think it makes sense to target equipment for earlier retirement, and how do you manage those dynamics?

Michael Stoddard:

Partly you manage it by figuring out how much financial incentive you're going to offer. And if there's a significant amount of the customer's own funds that is going into the project cost, they're going to be motivated to figure out whether this is a good deal for them or not. If they know their old heating system is on its last legs, or maybe it just stopped working, they know they're going to have to go out and get something. And so for those customers, in that sort of urgent purchasing mode, we have one set of strategies. And the best example of that is our heat pump water heater program, which I think currently is maybe the most successful one in the country. And that is because we have recruited every single distributor of plumbing hardware in the state, to participate in what we call a midstream program. And that means that any plumber that goes to their supply store to get a water heater, will be walking in the door to a store that is participating in our midstream program. And we offer a rebate, an instantaneous rebate on those heat pump water heaters, that will bring the price of that water heater down below the price of a regular electric water heater. So it would actually be cheaper for the customer to get the heat pump water heater.

So there doesn't really have to be much of a discussion. The plumber can just say, "Well, I'll get my customer the cheapest one that is here, thanks to this instantaneous markdown from Efficiency Maine." So they go load the thing onto their truck, they go check out at the cash register, and put it on their account, and we make a record that they have gotten a qualifying heat pump water heater. It is instantly marked down by the supplier, and we reimburse the supplier the next week.

So for people who've got an urgent purchasing decision, because something just broke or is about to break, that's our strategy for dealing with them. We don't do a lot of advertising to them, because they don't know it's about to happen, it's a surprise to everybody. Where we go is we focus to the store where they're going to go purchase it. So that is true at the Supply Store, it's also true at Home Depot and Lowe's. So there's a huge rebate that's instantaneous, and when they scan their little barcode, when they go to leave the store, the rebate from us will be deducted from the purchase price. So the customer doesn't have to pull out their checkbook and write a big check, and wait six weeks to get a rebate in the mail, it happens behind the scenes instantaneously for them.

And so that's a great way to get to those customers. But for people who are taking their time, and planning a purchase in what we call a retrofit, so they have a system that's working now, it's working okay, but they would like to switch to something different. Those are the folks that need more marketing, more background information to help them make a decision. And we try everything we can think of to help them see what the advantages of heat pumps would be. We have tons of case studies

and videos on our website, we have testimonials, we do a fair amount of advertising, as I said, online. And then we know that we've created enough momentum in the marketplace, that now the contractors themselves are doing a lot of that marketing. So I think the message is really getting out to people.

Abby Husselbee:

That's great. It sounds like you're doing a really effective job at making relationships with residents in the state, but also leveraging relationships with the business community. I thought we could also, now that we've talked about the program basics, talk a little bit about the Trust's role in running programs. So in contrast with many states, where the incentive-based energy efficiency programs, say, are being run by the utilities in the state, Maine is one of a handful of states doing things another way. You are a quasi-state agency, can you talk a bit about the trust relationship with the state, and how you collaborate with other agencies within the state?

Michael Stoddard:

Yeah, I'm happy to. So we were created by statute in 2010 as an independent trust, and I cannot overstate how valuable I think it has been for our organization, and for the programs that we run, to be truly independent and impartial. We are directed by our board of trustees, we have regulatory oversight from the Maine Public Utilities Commission, but our staff are professionals who are there to do what is in the best interest of the utilities customers. So the electricity rate payers of Maine, and the natural gas rate payers of Maine, and the energy customers of Maine, that's really who we answer to. And we're trying to do whatever we can through these programs to help those customers save the most money, and have them achieve the most comfort in their homes, by making these shifts to higher efficiency products and cleaner equipment. So we literally, in our statutory directive, are given a fiduciary duty to those customers.

I think this independence that we've had means, among other things, that we don't really have a conflict of interest the way you sometimes can experience with other program administrators. If they are also in the business of selling some of the fuels, or the energy supply, or the equipment that goes with these programs, they can get stuck in an awkward position where they might be asked to promote a product that will use less of what they offer, which would potentially reduce their profits. We don't have that conflict. We're not part of the executive branch and we're not part of the legislative branch, as a quasi-state agency. And that I think has earned us a lot of respect from folks on both sides of the aisle, that the information we're sharing has integrity, the analysis that we're doing and the strategies we're employing, are not questioned as to whether they're giving some partisan advantage to one side or the other.

I think the business community, the contractor community, and the customers, collectively see that we are just there trying to help grow these markets, and help people improve the energy efficiency of their homes and businesses. So in addition to that translating into, I think, a lot of trust that people have on the information that we're putting on our website, and the different products that we're trying to promote, it has also, I think, been extremely valuable in sustaining the funding, and the other kinds of policies that made our organization possible and make these programs possible. So I think this impression that we give out that we are nonpartisan, we're not affiliated, we're entirely impartial, and agnostic as to different technologies or fuels, means that the policymakers in our state look at us and say, "If we give the money to these guys, it's going to get out where it belongs, to the places we intended it to go, and it's going to be done efficiently and strategically."

And we've been able to deliver good results, and I think they've appreciated that the results are what they were hoping for. And so that has just meant that everyone feels like they have a little bit of

ownership of this. Everyone feels like they contributed, which they did. And I think that has really helped us out.

Abby Husselbee:

And you alluded there, to maybe other policies or programs in Maine that are supportive to the work you're doing. Can you talk about any of the other policies or programs that you think have helped make your heat pump programs successful?

Michael Stoddard:

Sure. So most of these kinds of programs around the country get funded through the utilities. And so the regulator of those utilities, in our state it's called the Public Utilities Commission, gives a directive to the utilities to say, "Hey, you need to set aside a certain amount of your budget next year, to invest in these energy efficiency programs, and you need to have a strategy and a plan for how you're going to do that. You need to report back to us next year." In our state, and in a couple of other states, that assignment was outsourced to us, as sort of an independent third party to administer those programs, to come up with those plans, and to do that reporting. Subsequently, Maine joined another nine states in the Northeast, about maybe 2008 or '09, to join a carbon cap-and-trade system called the Regional Greenhouse Gas Initiative, or RGGI.

Regulated entities need to buy their carbon allowances, buy them at auction. The proceeds of those purchases go to each state, in their proportionate share of the carbon allowances. In Maine, the policymakers said, "Let's give all that funding to Efficiency Maine Trust. They're independent, they'll put it to good use to help energy consumers get more energy efficiency, more weatherization projects, more clean energy projects, to help lower their energy bills and also reduce our carbon emissions." So it was a nice twofer, another example of a complimentary policy that we have in our state.

Recently, there's been a lot of grant funding from both the federal government, and then also we occasionally get settlements. A good example of that is with electric vehicle and electric vehicle charging funding. So those settlements and some of those grants have also been directed to Efficiency Maine, because we've built this institution that is very good at dealing with the marketplace, and with consumers going to that marketplace and promoting whatever these preferred products are.

So the most intriguing policy that was recently adopted in our state, is something called the Beneficial Electrification Policy Act. And I think that was in 2023, which said to the utilities and to us, "When you make your next three-year strategic plan, you need to include in that, plans for capturing as much electrification as you can, that will be both cost-effective and will reliably reduce electric rate payers' rates." We live in a state where there is a pretty sizable electric grid, it is used a lot during the day, but not very much at night. There are rural areas where there used to be bigger industrial facilities that aren't here anymore, and so there's a fair amount of capacity on our grid. And if we can get more users to put more use onto that grid, it will have the effect of diluting the price per kilowatt hour that they need to charge in order to pay for that grid.

So if we get more people onto EVs and heat pumps, we will be pushing down the price per kilowatt hour, for using the grid. It's not the same as what will happen to the price of the electricity itself, the energy part of the equation, but for the use of the grid that delivers that electricity to us, the price of that will go down per unit. So policymakers in Maine have said that would be a good thing, that would actually suppress our electricity prices and it would help advance our climate action plan and our climate goals. And so we put that into our plan, and that has helped justify a significant part of our budgets for the next three years.



Abby Husselbee:

That's really helpful. And I think, not necessarily a side of electrification that we hear talked about very frequently. I do want to pick up on some of the electricity needs that may come from building electrification. Listeners of this podcast may have heard a concern that wide scale building electrification, along with electrification, of vehicles could lead to electric load growth, and then potentially down the line, states like Maine could see a shift from the current summer electric peak to a winter electric peak. Of course, all of that is going to be really complicated, and depend on a lot of factors, but at a high level, I wonder how you're thinking about what that load growth looks like, and whether you will have a really active role in helping the state with demand management strategies.

Michael Stoddard:

Well, I'll start with the second part of that first, which is, we absolutely will have a role in the demand management for the state, we already are doing so. We have a program right now to encourage EV buyers to purchase a programmable charger for their home or business. And the charger connects to WiFi when you plug it in, and if you buy it with the rebate from us, it gets programmed to avoid charging during the peak hours in Maine, which is from 5:00 PM to 9:00 PM. So now, when people come home from work at the end of the workday, and I don't know how long their commute is, but suppose they left work at 5:00 and they got home at 5:30, and they pull into the driveway, and they get out of the car and plug in, it's 5:35, right in the middle of prime peak demand, which on a hot summer day would be bad for the grid, and we don't want to do that.

But if they have this charger, it's on a timer and it's just going to sit there and wait. And you go inside and you have dinner and do whatever you do in the evening, but your car is not going to start charging until nine o'clock, because it's on this pre-programmed charger. So we call this the off-peak charger program, we have been really successful marketing these to people who are buying EVs now, and also working more to reach out to people who have already bought a car in the past decade. Also, I see a huge future for batteries of all sizes, little ones and big ones, but the smaller home-sized batteries, like the Tesla wall pack is one example.

In a state like Maine, there's a lot of power outages from time to time. People are increasingly concerned about having emergency backup power during those outages. During the summertime, we don't really see very many of those outages,, so those batteries are just sitting there not doing very much. They could play a valuable role if they were aggregated together and if they were compensated to discharge onto the grid during those peak hours. So we have piloted a project that does that as well, you've probably read about the virtual peaker programs, in California and Puerto Rico and other places. So I think there's a huge future for all of these kinds of demand management projects, and we hope to play as big a role as we can in doing that.

To the first part of your question, the growth that is happening from electrification on the load of the grid, is growing for sure, but I think we have a bit of time to make a plan to meet that need, but also just in time. We don't want to over expend on building out the grid for what some hypothetical future need is going to be, because the costs of that are really significant. I mean, you're talking about billions of dollars in a region like New England.

And shifting all of that cost rapidly onto the rate payers of New England is going to turn them off of electrification, because electricity's going to get super expensive and that's not going to be very appealing. So I think we have to do it in a thoughtful, calculated, methodical way. And the timing has to line up with, as the load is growing, we're looking a couple of years ahead down the line, and building out the grid to where we think we're going to be in a couple of years, but not like 10 years into the future, but a few years into the future. So I get it that it's going to be a tricky balancing act. I know utility

people will say, "Well, we can't wait for too long, because it takes several years to build out that capacity."

And that's absolutely true, and I think all of our states should be looking at everything we could do to responsibly facilitate and expedite building out those resources, because the delays are just adding to cost and that's not a good thing. But we also don't want to have the utilities build out such a big grid so fast, that there isn't enough load base to spread the cost across. So we need to find a balance, but a critical part of it will be building out this load, so that there are more kilowatt hours being spread across the system and covering those costs, if that makes sense. It's a little bit of a counterintuitive, but I think it makes sense, and it's probably going to be a key factor in making this work.

Also, you can't overstate how much innovation has come into this space, with heat pumps and electrification in the last decade, and I would include batteries in that equation. I mean, there are technologies that just did not exist 15 years ago, they just didn't work in this environment, and they didn't work this well. And I do hold out some hope that industry will continue to bring in innovations that will help address some of the concerns for the longer term, as more and more people are shifting to electrification like heat pumps and EVs.

So one example is thermal storage. Thermal storage is a fancy way of saying tanks of hot water, usually. It could be other things too, but the simplest solution would be tanks of hot water. If you are heating up those tanks of hot water very, very efficiently with heat pumps, and they are sitting there waiting to supply you with a source of heat, you can actually use that in some homes now, instead of pulling more electricity off of the grid to make heat.

So we have been doing some experimentation in Maine with air to water heat pumps, not air to air, but air to water, or sometimes called hydronic heat pump systems. So the heat pump is feeding into those radiators I was talking about before, filled with hot water. And if they can pull off of these storage tanks from 5:00 PM to 9:00 PM, we were able to demonstrate we could completely disconnect the heat pump from the grid for those four hours. So you can imagine a future, 10 or 12 years from now, when we are a winter peaking region, if that comes to pass, which it probably will eventually, those heat pumps could just stop pulling off of the grid, and we could just heat that whole home off of the thermal storage tanks. And we did that in five homes, way up in Northern Maine where it is super cold in the winter, and we did that for a whole winter.

So we know that it can work, we can send signals. And that is a kind of demand management. We said, "Hey, let's give the grid a break for four hours, and we'll just pull off of these storage tanks, and then they can get reheated overnight and the next day." So new innovations like that, I think hold incredible promise, to help us mitigate the impact of this growing load on the grid, and do it in a really thoughtful way, so that we build out the grid we need, but not anything that's much bigger than that, because that could be too expensive.

Abby Husselbee:

Thanks so much for that. I really am appreciating hearing about both what your program looks like and how you've thoughtfully created it, and also the innovation and the vision that you have for your programs moving forward. Continuing to look forward, I think we need to at least touch on the shifting federal landscape. Although you're supporting state programs, Maine is obviously not unaffected by the shifting federal landscape. Your program predates the Inflation Reduction Act, but IRA had some additional incentives that could be braided with your programs. For example, I'm thinking about the IRA's extension of the federal tax credits for heat pumps, which the One Big Beautiful Bill Act, which was passed this past summer, eliminates at the end of this year, and I'm sure there are plenty of other examples of shifting federal supports.

With these changes at the federal level, has that affected how you're thinking about the future of your programs?

Michael Stoddard:

Not really. Not with regard to the grant programs you described, and the tax credits. The tariffs are a little bit more disconcerting, and I think it remains to be seen how that's going to manifest in the pricing, but that has me a little more concerned. The tax credits, the average residential consumer, I think tax credits help some, but they're not nearly as potent as instant rebates that they can see at the time of purchase. So especially for low and moderate income households, they're not going to wait till next June or whenever, if they get a tax refund, to get the benefit of that tax credit. So I don't think that was really front of mind for most of them. And frankly, those tax credits just weren't around for very long, they only came around a couple years ago, and they obviously are going out in a couple months here.

So those of us who've been running programs to promote heat pumps for over a decade, we had other incentives in place, and that's what most people at the local level, in our state, are focused on. I do think that the IRA rebate program was a very welcome set of additional funding for us to expand, where we were able to apply these rebates. One place in particular we were really able to accelerate, was in new construction of affordable housing. I mean, everybody wants to increase affordable housing availability, and you got to build it if you want to have it around. We really wanted to seize that opportunity, as those new units were getting built in Maine, to make sure they went all electric, because it's the old saying, an ounce of prevention is worth a pound of cure. It's a lot more affordable to do it when you're building it on the front end, than to go in later and rip out the old stuff and retrofit it with new stuff.

So we made a big part of our IRA rebate program in our state, just focused on new construction of low income affordable housing. It's all 100% electrified, and I think we've already booked more than 600 units of apartments to be subsidized by the IRA rebate program. So that's a great thing we were able to do with that. That program is still going, it hasn't been pulled back, so we're really grateful to have that.

But we'll just have to wait and see a little bit, it's a little bit premature to tell whether all the different grant programs are going to be kept intact. I do think the tariff issue is going to be important, and it's also very hard to predict whether and what kind of price impacts we'll see, but that is a little concerning.

Abby Husselbee:

We've continued to see shifts in what grant programs continue to be available, and also in the tariffs themselves, but hopefully some of that is of some comfort. So I've really enjoyed hearing about how you've built your programs. You've talked a little bit about the future and the innovation that you think needs to happen. I'm curious, what are your aspirations for your programs over the next few years, and where do you see the biggest opportunities for growth and innovation and impact?

Michael Stoddard:

Well, a huge opportunity for growth in our state, if the technology continues to improve, will be to retrofit these homes that have forced hot water radiator systems in them, with some kind of a simple, single replacement for the old boiler. Because right now the workaround that we have is putting in a multitude of mini split heat pumps around the home. And that's a little more expensive to do it that way, and a little bit more clutter. There's more equipment, there's more pieces of equipment on the outside of the home. It would be really slick if we just had a simple replacement. There are now models of heat pumps that are coming into the market that will make really, really hot water and they'll do it quite efficiently. And so we're hopeful that that progresses to the point where it's going to be economic and effective, especially in our very cold climate, to fully heat that home.

If that happens, it's going to really open the door to people retrofitting a lot more of the homes in, not just Maine, but a lot of New England, there's a pretty big percentage of homes that use forced hot water radiators. So that would be a really simplifying way to convert to electrification. Part of the reason we're so fixated on whole home solutions, is that our research on projects that have been installed in our state, shows that when people try to do a hybrid thing, they try to run them both concurrently. Well, I'll put in a couple of mini splits, but then I'll keep using my old furnace or boiler to do the other part of the house, or the basement, or the guest room up on the third floor.

What we've learned is that the heat pumps lose that battle, they don't play nicely together. And so even though people have the best of intentions, what regularly happens is that the boiler fires up to do its job, and when it does its job, it heats up the whole home quickly, because that's what it was designed to do. And the sensors in the little thermostats in the heat pump say, "Hey, everything's done. There's nothing left to do here. The room is warm and toasty, I think we'll just sit this one out." And so they don't run. So people aren't getting the benefit of the investment that they made in this exquisitely efficient piece of equipment. So we really need to be advancing more solutions where the heat pump can do the whole job, whether it's a bunch of little mini splits, or whether it's one big central heat pump system. And so we just want to get better and better at that, because with that is going to come improved economics, and with improved economics you have the hearts and minds of the customers, because then they're really happy. They have better comfort and they're saving money.

Abby Husselbee:

Yeah, that's obviously very central to what you're doing, and exciting to hear. Before we close out, for any other state policymakers that are listening today, do you have any words of wisdom? You've clearly built something that's really valuable here. And so if there are any lessons that you've learned, or things that you would tell them to focus on or avoid, I think that would be really helpful to accelerate building electrification across the nation.

Michael Stoddard:

Well, I'm not sure that our lessons are the same that others would take. And I don't want to presume that what worked for us here would necessarily work in other places, but we have done this for long enough in our state, that we feel pretty confident there are a few basics on what we've taken away from our experience in the last 10, 12 years doing this. One, is we have really benefited by keeping it simple. We require that, for the project to be eligible for an incentive from us, they must use a registered vendor. The registered vendor really is nothing more than a list on which they have signed up and said, "I will follow the rules of your program. I will follow this code of conduct and be a responsible contractor. I will understand that you're going to inspect 10% of my projects. And I understand that if I don't do those things, you can kick me off the list."

Well, these guys do not want to get kicked off the list, this list is like the mother load of marketing leads for them. So they're pretty motivated to do a good job, and to follow all the program rules and all the customer protections that we put in there. And we have had a really good results working things out with them on the backend, instead of on the front end. So I would say keeping it simple, and not getting in the way of the purchase decision from the customer and the contractors, is number one.

Encouraging competition has been very valuable to the success of our program. Because there are hundreds and hundreds of these installers, they got to keep their price quotes pretty reasonable. They got to keep them in the ballpark. They can't just jack up their costs and gouge the customers, because the next guy will come in and outbid them. So this has been really helpful in keeping our costs affordable, and making sure that people are getting decent quality services.

And then the last thing I'd say is, because a lot of this has been driven by policies, and policymakers make policies and help get the funding in place for these programs, I guess I would observe that we've been incredibly fortunate to not have that made a big partisan thing in our state. Both parties in our state deserve credit for having supported these programs, and the funding for them, and I think they both feel like they have equal ownership of it.

So when we go to the legislature, or anywhere, to report on our programs, or to defend them, or to promote doing more of them, there isn't one side looking at the other side saying, "Well, this is their thing, and so we have to be against it because we're in a partisan fight." And so our ability to have sustained this over a decade, I think has been one of our strong suits.

Abby Husselbee:

That's great. This has been so incredibly insightful, and hopefully a much needed bright spot for our listeners who are working in climate and clean energy. So thanks so much for joining us today.

Michael Stoddard:

It's been my pleasure.