



# Electric Vehicles: The Utility Connection

Webinar Transcript

December 11, 2019

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*This transcript reflects the statements made during a live webinar on December 11, 2019. The transcript has been reviewed for accuracy. Any grammatical errors or otherwise unclear passages are true to the statements of the presenters.*

## I. *Electric Vehicles: The Utility Connection*

### Slide 1. U.S. EPA's State and Local Energy and Environment Webinar Series

Operator: Ladies and gentlemen, thank you for standing by and welcome to the Electric Vehicles (EV): The Utility Connection conference call. At this time all participants are in a listen only mode. If you require any further assistance please press star zero. Please be advised that this conference is being recorded. I would now like to hand the conference over to your first speaker today, Ms. Andrea Denny, please go ahead.

Andrea Denny: Thank you J.P., and thank you everyone who is listening in today. We're happy to have you and we're very excited about the topic that we have coming up on the utility connection to electric vehicles.

### Slide 2. How to Participate

Andrea Denny: I'm just going to go through a little bit of logistical information about the Adobe software before we get started. There are several ways to participate during today's webinar. So the first is that participants can answer questions on the question and answer (Q&A) box in the right side of the screen. We ask that if you can please let us know who your question is directed to, if it's for a specific speaker that just helps us with moderating the questions at the end of all the presenters. The questions that we don't have time to get to we will have the presenters answer the questions offline and we'll post those answers on the Environmental Protection Agency (EPA) website when we post the webinar material. Another way to interact with the software is through the hyperlinks that you can see like the one on the screen that says State and Local Webinar Series page. All the hyperlinks that you see today are active, and if you click on those they will open the website that they're referencing.

### Slide 3. How to Participate

Andrea Denny: We will also be using, doing several polls throughout the webinar. It's fairly simple to participate but if you are on a mobile device or tablet you may need to exit full screen mode, tap on the poll icon which looks like a piece of paper dropping into a ballot box in order to be able to participate in the poll. There is no submit button. We see your responses as soon as you make your selection.

### Slide 4. Today's Agenda

Andrea Denny: And then the final way to participate is through the webinar feedback form. The link is posted in the Q&A box and at the end of today's webinar we'll share the link again. We do encourage you to fill out that webinar feedback form, it's very helpful to us for learning more about your experience on the webinar and we use that to improve our future webinars.

So that's just a little bit of background and now we can get into the content for today's webinar. We're going to start, I'm going to do a little bit of intro about my program here at EPA and as well as my colleague Jessica Daniels from EPA's Office of Transportation and Air Quality (OTAQ), who's going to talk about some of the resources they have.

And that's going to be followed Erika Myers, from the Smart Electric Power Alliance, Hanna Terwilliger from the Minnesota Public Utilities Commission (PUC), and Emeka Anyanwu from Seattle City Light. At the end of all three speakers, we'll have a question and answer session based on the questions that you type into the Q&A box.

## II. Introduction

Slide 5. Introduction

Slide 6. U.S. EPA's State and Local Energy and Environment Program

Andrea Denny: So I just wanted to briefly introduce the State and Local Energy and Environment Program which is where I'm housed at EPA. We try to support state and local and tribal governments that are interested in energy strategies that lower emissions. We offer free tools, data, technical expertise about energy efficiency, renewable energy and other emerging technologies. And you can access all of those resources at Energy Resources for State, Local and Tribal Governments website which is available through the link on your screen. Sorry, Alexis, I lost my internet connection, so I may need you to advance the slide for me.

Slide 7. U.S. EPA's State and Local Energy and Environment Program

Andrea Denny: OK, we are doing – one of the resources that we're offering is this electrification webinar series in addition to our webinar today. We are planning to kick off a series of additional topics in February of 2020. We'll cover topics such as shared mobility, codes, planning, and other relevant topics.

You can get notifications by subscribing to our newsletter and you can access all webinar materials at our State, Local, and Tribal Webinar page. We do – have done two past webinars - one on workplace charging and one on electric vehicle (EV) trends and projections and the recordings and all the materials for those webinars are available on that webinar page.

I also wanted to mention our ENERGY STAR-certified EV supply equipment resources, in addition to the website linked there. I wanted to let everyone know that we actually have ENERGY STAR-certified Level 1 and Level 2 chargers, and direct current (DC) fast charger certification will be coming in spring of 2020. On the website that's linked here, you can find buying guides and sample procurement language. And something that might be interesting to the state and local governments on the site is that the California Energy Commission and New York State Energy and Research Development Authority (NYSERDA) have adopted ENERGY STAR as a purchasing requirement. So that's just an interesting way that we're seeing state governments start to integrate these ENERGY STAR certifications into some of their requirements.

Slide 8. U.S. EPA's State, Local, and Tribal Transportation Resources

Andrea Denny: And now I'm going to turn it over to Jessica to talk a little bit about OTAQ resources.

Jessica Daniels: Thank you, Andrea. My name is Jessica Daniels. I work in EPA's Office of Transportation and Air Quality. OTAQ aims to reduce emissions from the transportation sector. We develop and implement mobile source regulations and conduct emissions and fuel economy testing in our National and Vehicle and Field Emissions Lab in Ann Arbor, Michigan. We also work closely with state and local governments by offering expertise on state implementation plans, the Motor Vehicle Emission Simulator (MOVES) Model and related programs.

Slide 9. OTAQ's Voluntary Programs and Initiatives

Jessica Daniels: OTAQ coordinates several voluntary partnerships to help reduce emissions through the Clean Diesel Program, the Ports Initiative and the SmartWay Program for freight transportation.

Slide 10. Electric Vehicle Trends

Jessica Daniels: Annually, we evaluate and publish information about new light-duty vehicles, greenhouse gas emissions, fuel economy data, technology data, and auto manufacturer's performance data in meeting the agency's greenhouse gas emission standards.

Slide 11. EPA Resources for Consumers

Jessica Daniels: And we provide resources to make it easier for the general public to understand vehicle emissions and their impact on the environment, both on [fueleconomy.gov](https://www.fueleconomy.gov) and EPA's website.

Slide 12. Contact Information

Andrea Denny: Great, thanks Jessica.

### III. Poll 1

#### Slide 13. Poll 1

Andrea Denny: And now we're going to do our first poll. So our first question for everyone participating today, is to learn more about what type of utility action on transportation electrification you are aware of in your state, city or region. You can select more than one answer.

So some of the choices include: we're evaluating potential interest, we are engaging with the utility to explore options, our utility is seeking approval for EV-related programs, our utility is implementing EV-related programs, it's too complicated to answer in a simple poll, or so far there has been no action, or other. And if you feel so inclined you can provide more detail about some of those choices in the Q&A box, particularly maybe if it's too complicated to answer via one of these check boxes. So we'll just give people a few moments to fill out that poll.

All right so it looks like we're seeing a pretty broad split, but the largest answer was that our utility is implementing EV-related programs, so that's great to hear. Followed by we're engaging with them to explore options which is also another thing we're very happy to hear. Tied with 22 votes, we have people who are evaluating potential interest and utilities that are seeking approval for EV-related programs.

Eighteen votes for it's complicated, 13 votes for no action, and 20 votes for folks who aren't quite sure and maybe this will inspire you to go home and dig a little bit more into that and find out what's happening in your community. All right, well we're going to move on now to our first speaker.

## IV. *The Role of Utilities and Vehicle-Grid Integration*

### Slide 14. The Role of Utilities and Vehicle-Grid Integration

Jessica Daniels: All right, welcome, Erika Myers. She's the Principal of Transportation Electrification for the Smart and Electric Power Alliance, also known as SEPA. Erika has 15 years of experience in the clean energy sector, and specializes in the nexus between the grid, electric vehicles and renewable energy. She heads SEPA's transportation electrification research. Erika has a bachelor's degree in Biology from Clemson University and a master's degree in Earth and Environmental Resources from the University of South Carolina, with a specialization in clean energy.

### Slide 15. The Role of Utilities and Vehicle-Grid Integration

Erika Myers: Thank you all so much, I appreciate being here, and thank you for inviting me to speak on this webinar today. For those of you who aren't familiar with the Smart Electric Power Alliance, we are a non-profit organization based in Washington D.C. and we envision a carbon-free energy future by 2050. We believe that our members and the folks that we coordinate with will be ultimately required to make this vision a reality.

### Slide 16. About Smart Electric Power Alliance (SEPA) - Four Key Pathways

Erika Myers: And our mission is to facilitate the electric power industry's smart transition to a clean and modern energy future through education, research standards and collaboration. We are focusing on four key pathways in order to enable this transition: utility business models, regulatory innovation, grid integration and transportation electrification are four key things that we think will enable a smooth transition and the things utilities are focused on today as important pivot points for enabling more clean energy integration. And as it relates specifically to transportation electrification, we believe that the nation's fleet of light, medium and heavy-duty vehicle should also be carbon free by 2050.

### Slide 17. Electric Vehicle (EV) Infrastructure Forecasts

Erika Myers: So when we think about electric utilities and their role in this transition to carbon free fleets, we have to think about utilities in the context of their competitors in this space at this point which are the fossil fuel industry, for example, Shell and Exxon.

And so thinking about utilities becoming that sort of a fuels provider is obviously going to require a lot of change internally and externally for utilities. The thing that's going to be more challenging I think for a lot of utilities to reconcile is that their business models are not going to be exactly the same. Oil can be stored, it can be used when it's needed. It can be more flexible for demand seasonally or across years. Whereas for electricity, it's got to be used instantaneously at the point of generation. So it requires a lot more thought and coordination than the traditional fuels that we have today. So from that perspective, SEPA's focus has been largely built around the idea of load management. And load management being what we think of is vehicle grid integration, specific to the EV sector, we've bucketized into two major areas of manage charging and vehicle to grid.

What we think about the opportunities for EV infrastructure, now is the time for us to think about integrating load management strategies as opposed to after the infrastructure is in the ground. For example, this chart here on the webinar shows the forecast from the Edison Electric Institute (EEI) in conjunction with Navigant that was published in 2018 that believes that we'll be between now and 2030,

require roughly a tenfold increase in the amount of charging infrastructure, both for home, public and workplace charging.

When we think about the opportunity set here, with a tenfold increase, we, we can absolutely influence how we would go about designing a managed charging program, for example, through the equipment that's deployed, making sure that it's managed charging capable and I'll talk about what that means exactly here in a moment.

#### Slide 18. Impact of Residential EV Charging

Erika Myers: So a lot of times we talk about the impacts of EVs, so don't get into a lot of the specifics. This chart from Synapse Energy showcases that we see a widespread deployment of Level 2 EV chargers among residential consumers like we – was suggested in the previous chart from EEI. We will see a quite a bit of growth on the distribution system in terms of capacity demands.

As you can see here comparing one type of energy consuming device versus others, Level 2 EV chargers today there are somewhere between 3.3 and 6.6 kilowatts actually could potentially exceed the demand of central air-conditioning units. And this is not just the seasonal demands, this would be a daily demand potentially that you would see showing up over the course of the year.

#### Slide 19. No title

Erika Myers: Same study done by Synapse Energy, they found that on an average feeder circuit in Midwest, if they saw a 25 percent increase in EV load penetration on a typical day in September, it could increase the maximum demand on that system by up to 30 percent over their average. So they would, that would be for uncontrolled charging that overlaps with on-peak hours.

#### Slide 20. Load Management is Important

Erika Myers: So what we believe will be the opportunities out here with load management is to help encourage people to charge off-peak. You can do that through rate design, it showcased here in the light blue, or helping to align the charging pattern with potentially lower-priced energy or off-peak energy as showcased in the dark blue. It's what we call active managed charging.

One of the potential downsides of relying heavily on a rate program, is what's known as timer peaks. And this would be when everybody charges, or sets their charger or their cars to start charging the exact same off-peak times, resulting in distribution system spikes during those hours, and we're starting to see some of that in higher penetration areas becoming more and more of an issue.

With active managed charging, you can help smooth out some of that, (i.e.,-demand) and also, again, better align with things like clean energy as showcased here on evening hours with wind or in a daytime, you could encourage workplace charging programs that could utilize solar.

#### Slide 21. Managed Charging Strategies

Erika Myers: So we see basically two forms of managed charging here as I illustrated in the light blue. Passive managed charging could include thing like time varying rates. But it could also include other behavioral load management programs we've seen before. Things like communication via text to encourage customers to charge maybe delay by an hour, also retroactive incentive programs that

reward off-peak charging, through things like bill credits or Amazon gift cards. Active load management is a lot more like direct load control through things like the charging device, or through the vehicle itself using automaker telematics.

#### Slide 22. All Utilities Are Not the Same....

Erika Myers: Not all utilities, of course, are starting from the same place, where they would go about with their load management program largely depends on a number of variables. Just for illustrative purposes, we identified for example, the penetration of light-duty residential EVs, the available distribution capacity, the integration of intermittent loads so, for example, if you're in a state that requires renewable portfolio standards you may want to think about that as a variable to consider, as well as the cost of on-peak electricity which for folks that rely on generation and transmission cooperatives (G&Ts) for their power maybe more of a sensitive, you know, thing to consider. .

#### Slide 23. ... Some Have a Different Starting Point

Erika Myers: We also, we divided some examples here both for passive and for active.

#### Slide 24. Passive Managed Charging

Erika Myers: All of this information is available in our report that we recently published called the Residential EV Rates That Work: Attributes That Increase Enrollment.

#### Slide 25. EV Rates Landscape

Erika Myers: When we looked across the landscape of passive managed charging opportunities, specifically for time varying rates, we found that only 64 rates were EV specific, most of which were time of use rates. We also found that most of the rates were fully implemented, with some of them being part of pilot programs, meaning that they would eventually be rolled off.

We also found a different variety of strategies in which the rate applied to the home load. Some of them applied to the total household energy consumption including the EV charging load, and some of them were applied strictly to EV charging. Some rates allowed both underneath a single tariff.

We feel that offering maximum options to customers was most likely to increase enrollment, because not everybody has the ability to alter their energy consumption patterns for their entire house, but they may have more availability to alter those on-peak charging versus off-peak charging times, if it's just applied to the charger itself.

#### Slide 26. Why Utilities Created EV Rates

Erika Myers: When we asked utilities as part of a survey for this report, why they created EV rates, the vast majority of utilities that participated said that they wanted to incentivize adoption. They felt that by helping consumers save money through things like off-peak charging, that it would be an incentive for the people in their service territory to buy EVs. And actually that does align with some other research that we did with Enel X, with approximately 3,000 EV drivers, is that the number one reason, people buy electric vehicles is to save money.

There second highest reason to buy EVs is to help with the environment. So we found that by offering EV rates that utilities are in fact helping to send price signals that are important to their customers.



#### Slide 27. EV Rates Work When....

Erika Myers: We also relayed the information we received from utilities that have had at least one year of experience with an EV rate at the time of the survey with their enrollment levels to see what factors increased the amount of adoption of those EV rates. And not surprisingly, marketing budgets made a big difference. In fact, a 3 times increase in enrollment if a marketing budget was available within a utility to tell their customers about the rate versus those that did not.

We also found a big increase if it was a utility-driven EV rate initiative versus if it was required by the public utility commission or legislatures. We also saw 2 times increased for rates that had bill savings for the customer versus those that did not have a bill savings or that were neutral between the EV rates versus the generic rate. Also free enrolment in the rate was a big deciding factor and the use of multiple marketing channels.

#### Slide 28. Main Challenge: Metering

Erika Myers: One of the sections that we added to this report was metering. We realized pretty early on that metering is the major challenge for implementation of rates. I won't go into a lot of details here, but I would encourage you to take a look at this section of the report, if that's of interest to you.

#### Slide 29. Active Managed Charging

Erika Myers: The second report we wanted to highlight as part of the remarks today is a Comprehensive Guide to EV Managed Charging. This is also available on this SEPA website and free to download.

#### Slide 30. How does it work?

Erika Myers: And it goes through all the different opportunity sets by which utility could go about designing a managed charging program and some factors to consider, including things like messaging standards, protocols, examples of how utilities are implementing programs today, as well as a complete list of managed charging program in the U.S.

On a very high level on its face, managed charging is very simple. So essentially you start – for example with the illustration in the left, you've got basically two layers. You've got a transport layer, so this is how the message is actually physically delivered to a – to eventually to an electric vehicle. And then you have the message itself. So, you have to make sure that the message can be received by the charger or the vehicle and then an action can be taken that's called a messaging protocol.

So the transport layer protocol for the example on the left is essentially utility data center would send a message through broadband to the homes that are subscribed in or enrolled in the program. And then that message would be directed from the home router via Wi-Fi to the charger as you can see in the garage. That charger would then understand the message that's been relayed and it would tell the vehicle to either delay or stop a charge.

On the example on the right, the utility would coordinate with a network service provider. They would say, hey, please curtail the charging by a couple of hours. On this day we have constraints that we need to manage around. So then the network service provider would send a message through cellular to all the chargers enrolled in their workplace charging program that would then send the signal to delay or curtail a charge for those hours. So it's very simple on its face.

#### Slide 31. Managed Charging Projects to Date

Erika Myers: The implementation obviously is a little bit more challenging. Managed charging projects to date, this showcases that we've – we identified normally 38 projects around the country, we knew that that's probably changed since we did this survey earlier in the year. We knew more and more utilities are looking at opportunities. When we did the survey, we identified most of those charging programs were done through the charging device with five related to the vehicle and six behavioral load control.

#### Slide 32. How Utilities are Using Managed Charging

Erika Myers: We asked utilities why they were using or planning to use managed charging programs. Major – pretty much two major reasons, to avoid higher cost periods of energy supply and to help their customers manage use and increase customer engagement.

#### Slide 33. State of the Managed Charging Industry

Erika Myers: The state of the managed charging industry, it's important to note, we see that there's more and more progress compared to when we did the survey originally two years ago. We found that the vast majority of network service providers have managed charging-capable software platforms and roughly 65 percent of EV charging infrastructure and manufacturers also provide at least one managed charging-capable device.

#### Slide 34. State of the Managed Charging Industry (Cont'd)

Erika Myers: We did a closer review of the managed charging capable equipment by level. We found that 63 percent of all those managed charging-capable devices were Level 2. With the some larger portion about 25 percent DC fast charging for light-duty. And then rounding out the balance was DC fast charging from medium and heavy-duty in Level 1.

#### Slide 35. Next Steps

Erika Myers: There are obviously a number of different steps that we need to take to get to a managed charging future. The first, I'll just note that probably the biggest two are identifying the value of managed charging - creating an evaluation framework were by everyone can agree on what are the cost and the benefits and then determining the values of each.

And then second, defining a business models for managed charging to make this as cost effective as possible to implement. We think about load management it's not just in a vacuum for EVs, you're comparing the cost as well as demand response program, including a smart thermostat or water heater program. So we've got to make sure that the value exists and then it is a positive return on investment (ROI) for our utility members.

#### Slide 36. SEPA EV Working Group

Erika Myers: I would like to also note that we have an EV working group that's open to all SEPA members. If you aren't sure if you're a SEPA member, we have information on our web page here at the bottom. The link is [sepapower.org](http://sepapower.org). And we keep that up-to-date, it's – with all the organizations that are members of SEPA and you're welcome to participate in any or all of our working groups. We have a total of 11, not just for electric vehicles. We have a variety of subcommittees as well, if you'd like to work with other of your peers on these different topics, they also have their own meetings and their own activities.

#### Slide 37. Erika H. Myers, Principal, Transportation Electrification

Erika Myers: Here's my contact information if you'd like to follow up with me after the call today, I'd be happy to chat with you. And that concludes my remarks. Thank you.

Andrea Denny: Thanks so much, Erika. And just a reminder which we're seeing a number of questions come in, but if you have questions for Erika you can take a moment to type them into the Q&A box now, or later on during our webinar.

Slide 38. Poll 2

Andrea Denny: And we are going to move to our second polling question. So, with this question we're interested in learning about what types of EV program you're most interested in collaborating with utilities on. The answer choices include, we're evaluating potential interest. We're engaging with them to explore options. Sarah, I believe these might be the wrong answers.

I'm sorry, guys. I think we're having an issue with this poll. And I think the wrong answers were inserted in into this question. So I'm going to suggest we actually skip this poll, and just move on with our next speaker. Sorry about that.

## V. *Minnesota Public Utilities Commission Transportation Electrification Efforts*

Slide 39. Minnesota Public Utilities Commission Transportation Electrification Efforts

Andrea Denny: So our next speaker is Hanna Terwilliger.

Jessica Daniels: Hanna Terwilliger has worked as an economic analyst with the Minnesota Public Utilities Commission since 2016. At the Commission, she works on a wide range of issues related to electricity including distributed and energy Resources, integrated resource planning and electric vehicles. Hannah graduated from the University of Minnesota's Humphrey School of Public Affairs with a Master of Public Policy and also holds a bachelor's degree in Political Science from St. Olaf College. Prior to her time at the PUC, Hanna worked in the nonprofit sector on environmental and energy policy, and completed a year as an AmeriCorps Volunteer in Service to America (VISTA). I'll welcome Hanna.

Slide 40. Minnesota Public Utilities Commission (PUC) Transportation Electrification Efforts

Hanna Terwilliger: Thanks. So I am an analyst with the Minnesota Public Utilities of Commission.

Slide 41. No title

Hanna Terwilliger: And I want to note that any views expressed are the – my own views and not necessarily those of the Minnesota PUC.

Slide 42. Minnesota Public Utilities Commission

Hanna Terwilliger: So the Minnesota Public Utilities Commission regulates Minnesota's monopoly industries. So that includes electricity, natural gas, telecommunications and routing and need for large energy facilities. We have around 60 staff in our various units, and then we have five commissioners, and we are a quasi-judicial agency. And so at that level, we are similar to a court in that our orders have the weight of law.

Slide 43. Electric Vehicles (EVs) in Minnesota

Hanna Terwilliger: So quick overview of electric vehicles in Minnesota. This map shows the distribution of electric vehicles throughout our different electric utility service territories. As of April 2019, we had just hit about 10,000 passenger EVs registered in the state. The majority, of course, are in our major metro area, but they are through almost every single county in the state. And well over half of our electric utilities have at least one electric vehicle registered.

Slide 44. Major EV Policy in Minnesota

Hanna Terwilliger: A few notes about major EV policy in Minnesota. At the Commission, we would regulate and approve any utility EV rate and infrastructure proposals, but we don't have any authority over charging providers. Those have been exempted from Commission regulation. And then the other – another major player is the Minnesota Pollution Control Agency who regulates air quality.

They are the Volkswagen settlement funds disperser and they are currently working on a rulemaking to adopt the zero-emission and low-emission vehicle standards. Of course, other state agencies also play important roles like the Department of Transportation, our Metro Transit, Department of Administration's State Fleet Goal, et cetera.

And each state agency has a different role in regulating and encouraging EVs. So check to see who in your state is both funding the – or working with the VW settlement and what your state's PUC, MP (inaudible) or public service commission (PSC) is doing because they will have a big impact on what your utilities are doing.

In Minnesota, the PUC only regulates our investor-owned utilities and one coop. And so cities with their own municipal utility or if you're in a cooperative utility may have different regulatory structures. So if you are from a city that has your own municipal utility, there's a really great opportunity for you to interact with them, and work with them to promote EVs and get EV specific rates in place.

#### Slide 45. Commission EV Inquiry

Hanna Terwilliger: So in 2017, the Commission initiated an inquiry into EV charging and infrastructure. And that's where we wanted to look at the possible impacts of EVs on the electric system and also look at the benefits. So we gathered input from our stakeholders, utilities, state agencies, local governments. And then the Commission made a series of findings that transportation electrification is in the public interest. How EVs are integrated with the grid will be critical to ensuring widespread benefits not just for EV owners but for ratepayers and society as a whole, and that utilities have an important role to play in transportation electrification.

There are many state public utility commissions that have opened similar inquiries and are looking for broad stakeholder input. So this is a great place for state and local governments to weigh in on what your EV plans are and what your needs might be, and how the utilities can assist.

In Minnesota, one result of our inquiry was to require utilities to engage in transportation electrification plans for an annual look at what EVs are doing in their service territory and what programs the utility plans to offer. And if your state has something similar, this is another great place both for information and to weigh in.

So for example, during our review of the utility's first Transportation Electrification Plan this year, the city of Minneapolis, our largest city, noted that there was a lack of support for multifamily housing charging programs by its utility, Xcel Energy, which was important information for us with the Commission to have and we subsequently ordered Xcel to file a multifamily housing charging program within the next nine months.

#### Slide 46. Existing and Forthcoming EV Dockets

Hanna Terwilliger: So I won't go through all of these individually, but this is just a quick snapshot of the projects, pilots, and programs that the Commission has seen over the past few years and that we have forthcoming. They address a lot of the different challenges that we're seeing with EVs anywhere from infrastructure for residential customers to fleets, rate designs for demand charge relief, residential time of use, and then as I mentioned the multifamily housing and metering solution.

And I'll note that Xcel Energy has indicated it was – it's looking into vehicle-to-grid demonstration projects for school buses. But – And then if that turns into something that would be feasible, they will file a pilot with the Commission.

And this is only a list of what our regulated utilities are doing. Over half of Minnesota's 44 electric cooperatives have at least one off-peak charging rate. Some have two rates, as do many of our

municipal utilities. And at least two of the co-ops that I've talked to folks from have over 50 percent of their vehicles on time of use or off-peak charging rates that are specific to EVs.

And a key focus for the Commission has been requiring rate design that is more reflective of hourly system costs with price signals to reduce peak demand. And so that's really to help avoid those adverse system impacts, especially in the distribution model that Erika was talking about.

And so, we're collecting information on that specifically through those transportation electrification plans. And we've also required smart chargers for any ratepayer-funded chargers that are going in. So even if we don't have the more advanced managed charging rates, now when those come into effect, customers who already have their chargers can switch on to those more actively managed charging rates.

#### Slide 47. MN Interagency EV Working Group

Hanna Terwilliger: One thing that we have going with our state agencies is a very informal interagency working group. And so the goal of this is to share information about what different agencies are working on, on EVs. This is this is really easy to start. Our Pollution Control Agency convenes it. But it's a great way for us to all share resources and it doesn't take up a lot of time and to share that information.

So that's a great thing to consider in your state, if you're from a state government, is to get together different agencies that have a stake in EVs whether that's working with utilities, working with state fleet procurement goals or local transit agencies.

#### Slide 48. State, Local, and Tribal Government Involvement

Hanna Terwilliger: And so at the Commission, as we're reviewing utility proposals, local governments and state governments and tribal governments are all really important stakeholders for us to hear from as we're doing EV planning. We need to know if the pilot the utility is proposing is something that's going to meet your needs, or if it's just not the way it's proposed, you wouldn't enroll in it even if you are the intended customer. So, it's important for us to hear from you as we go about that.

#### Slide 49. Example: Xcel Energy Infrastructure Pilots

Hanna Terwilliger: So I'm going to give an example of a recent infrastructure pilot that our largest utility, Xcel Energy, proposed. And I will just make a starting note the PUC did issue final approval this program on October 7th of 2019, however, it is currently being appealed before the Minnesota Court of Appeals. And so we're waiting to find out what the final status will be but the Commission has issued its final approval.

So in this proposal, there are two pilots that would provide make-ready infrastructure for different charging use cases, fleet charging and public charging. Make-ready infrastructure is the necessary electrical upgrades and wiring up to but not including the vehicle charging device. And especially for public and fast-charging applications and depending on the location of the charger, this can be a really large portion of the installation costs for charging equipment and necessary to help out with the transportation electrification.

So in the first pilot, it would provide make-ready EV charging infrastructure and then an optional charger service for fleets. And in this case, there was strong support from our local municipal governments, including Metro Transit, which is our bus provider, the State Department of Administration, and City of Minneapolis, as it would help support their fleet goals.

And during our input process, comments from the state agencies helped both Xcel and the Commission modify portions of the program to make it more accessible to local government bodies to some of the terms and conditions of the service agreement.

The second pilot would provide make-ready charging infrastructure for public charging and community mobility hubs. So there's two components to this portion. There's the public charging which is your DC fast charger, so any DC fast charger that's publicly available can access funds to help with that make-ready charging infrastructure. And then the community mobility hubs are a really cool pilot where a nonprofit ride-sharing – or nonprofit car sharing, HOURCAR, will provide electric one-way car service stationed throughout the Minneapolis-St. Paul metro area. And then there would also be Level 2 and DC fast chargers available for the public to use. And those would all be located around community mobility hubs with access to other forms of public transportation. So this was another example of a partnership with local government in this case and the nonprofit where it was important for us to have their buy-in with the Commission and with the utility as they came forward and proposed their program.

And then both pilots are using an existing demand charge limiter time of day rate. And so it's a lot of fancy words, but basically, the existing rate structure was already fairly favorable to DC fast chargers that have a lower utilization faster and so the most demand charges can be really high, but the way that the rate is constructed helps mitigate that, especially when you're just getting started on DC fast charging.

And so these two pilots, as we went through the approval process, state and local government was really involved in providing input to the Commission, which was very helpful to us as we went through an issue to our final approval.

Slide 50. Thank you!

Hanna Terwilliger: And then I will just note that our web page linked here has more information. It's got a lot of the charts and the graphics that I showed along with the data download of EVs per service territory, so you can check that out and updated as we get new filings in. And you can, of course, reach out to me if you have any other questions. And there's a lot more details in our eDocket system about each of the individual pilots. Thanks.

Andrea Denny: Thanks so much, Hanna.

## VI. Poll 2

Slide 51. Poll 3

Andrea Denny: We are going to go ahead and try and do that poll again. I think we have the correct answers this time. All right. So what type of EV programs are you most interested in collaborating with utilities on? And your choices include: infrastructure deployment, enabling fleet electrification, rate design and getting EV charging costs down, basic consumer outreach and education, promoting EV adoption, generally meeting air quality or climate goals, other, and if you choose other, please type it into the Q&A box so we know what you're talking about, and not sure or none of the above. And you can select more than one answer.

All right. Take a few more seconds to get your last answers in. All right, I think we can go ahead and close the poll. Great. So it looks like the most popular thing that people were interested in working with their utilities on was infrastructure deployment, followed closely by promoting EV adoption.

And then we saw enabling fleet electrification and basic consumer outreach and education with 51 votes, meeting air quality and climate goals with 49 votes, rate design and getting EV charging costs down with 48 votes, and then just a handful of other or not sure, none of the above. And thanks to those of you that typed in your other in the Q&A box. All right. Thanks so much for participating in our poll. This is helpful information for us. And we are going to move on to our third speaker.



## VII. *Building an Action Plan for Transportation Electrification in Seattle*

### Slide 52. Building an Action Plan for Transportation Electrification in Seattle

Jessica Daniels: Emeka Anyanwu joined Seattle City Light in March 2018 and leads teams responsible for power resource management and planning, regional affairs, customer energy solutions, and electrifications strategy, including grid modernization and strategic technology deployment. This team is helping to lead Seattle City Light's efforts to evolve the utility as operational and business models become more innovative and pivot to meet the current and future customer and community needs and expectations in the new energy marketplace. He has also served on the External Advisory Committee for the Electrical and Computer Engineering Department at Iowa State University and is a graduate of the Greater Kansas City Chamber of Commerce's Centurions Leadership Program. Welcome Emeka. Thank you for being here.

Emeka Anyanwu: Thank you. Can you hear me OK?

Jessica Daniels: You sound great. Thank you.

Emeka Anyanwu: All right. Thank you and good morning to everyone.

### Slide 53. Building an Action Plan for Transportation Electrification in Seattle

Emeka Anyanwu: I'm here to share with you a little bit about how we are approaching transportation electrification in Seattle. As you've just heard, my name is Emeka. I am the Energy Innovation or Resources Officer at Seattle City Light, which is the municipal utility that the department of the City of Seattle serves the Seattle area.

### Slide 54. City Light Quick Facts

Emeka Anyanwu: So first, I'll start with the requisite quick facts about our utility. Seattle City Light serves both the City of Seattle as well as the portion of about seven neighboring cities and unincorporated King County, which is the area surrounding the City of Seattle. We serve a population of just over 906,000 residents and more than 460,000 meters. And we have about 1,800 employees, just over 1,800 employees here.

From the supply side, we operate principally on clean energy. So 52 percent of our power is hydropower that comes from dams that we own. And we also have a significant portion of resources from the Bonneville Power Administration.

So, on the usage side, as you can see from the numbers where we use about 98 percent non-emitting resources. Our utility has also been carbon neutral since 2005. And we use renewable energy credits (RECs) to offset any carbon impacts of our utility operation.

### Slide 55. Carbon Emissions

Emeka Anyanwu: So this next slide shows a comparison of carbon emissions between the average in the United States and what we have here in Seattle. The one thing you'll note, of course, is that Seattle doesn't have any electricity or agriculture emissions really to speak of because of the clean power from our dams and we serve primarily an urban area.

And as such, for us, transportation electrification offers the single greatest solution to meet decarbonization goals. The City of Seattle recently passed an ordinance for the Green New Deal, which sets a goal of becoming carbon neutral for this city by 2030. And so city – Seattle City Light, as I said, has been carbon neutral since 2005 and is part of that city infrastructure trying to advance the Green New Deal.

#### Slide 56. Utility of the Future

Emeka Anyanwu: This slide shows representation of some of the things we think that are part of our vision of the utility of the future. We believe that transportation electrification is a triple win, for the utility, for the customer, and for the environment, because of our clean energy and lower rates. Anything that we electrify essentially is decarbonized. But for us to capitalize on that win, we need to act quickly and be strategic.

So I'll start by giving you some background on how we've gotten the authority to do this work. Then I'll outline our journey so far toward transportation electrification. And then finally, I'll talk a little bit about some of the next steps that we have planned.

#### Slide 57. Washington State House Bill 1512

Emeka Anyanwu: So the picture that you see here represents is a picture of a signing ceremony that was – that took place in the office of Governor Jay Inslee. In the State of Washington, earlier this year we passed House Bill 1512, which was our trigger to begin this work.

This bill allows utilities to incentivize and promote transportation electrification, including the charging infrastructure. And I think it's important to note here that utilities were granted this authority, because that highlights the way the role we play as public service entities in this transition to electric transportation.

Also, the legislation stipulates that before we can start incentivizing transportation electrification and move forward with this work, we need to create a plan and get the approval of our governing body which for Seattle City Light is our City Council.

#### Slide 58. Transportation Electrification Journey

Emeka Anyanwu: This slide shows our journey, really in four steps. The first step is to put together a strategy. The second step is to create an action plan to achieve that strategy. The third step is to design and implement that action plan. And finally, the fourth step is to evaluate and adjust from that implementation.

#### Slide 59. Transportation Electrification Journey

Emeka Anyanwu: So, what I'm going to probably – or I'm going to talk about next is really the first two steps which is where we are with our development and sort of what our plan is to create the document we will take to our governing body for approval.

#### Slide 60. Step 1: Internal Strategy Development

Emeka Anyanwu: The first step for us was getting square on our strategy and values, which really is to answer the question why are we going to do or what we're going to do? In our strategy, which was released publicly earlier this year, we concluded that we needed to prioritize the values of the

environment, the value of equity, and the value to the grid. We want our interventions to reflect in as much as possible balance those three core values. On the environment piece, we want to include – improve air quality and public health and reduce traffic congestion.

For equity, we want to conduct racially inclusive collaboration and engagement. And in addition, we want those benefits – the benefits of electric transportation to extend to underserved communities. And then finally, for the grid, we want to optimize our asset utilization, avoid unnecessary upgrades and ensure reliability and resiliency for our system. When we talk about the grid here at Seattle City Light, we think of the grid as a shared community asset because we are a public utility.

#### Slide 61. Step 1: Strategic Utility Intervention Areas

Emeka Anyanwu: Our strategy also highlights three main strategic utility intervention areas. The first one being investing in charging access and coverage, the second being creating new rates and improve customer service for the transportation market, and the third being preparing for medium and heavy-duty commercial fleet electrification and supporting and facilitating that transition.

We think of those, really, as we looked at this as areas where our intervention is most likely to have a positive impact on transportation electrification. And so our goal is to engage in those areas and hopefully impact the overall outcome.

#### Slide 62. Step 2: Action Plan Scope

Emeka Anyanwu: Our next step or second step is putting together a plan for council approval, as I mentioned earlier. That part of the plan includes three components. The first component is that we're bringing a proposal of a resolution for our council to adopt the state legislature language, which allows us to promote transportation electrification. Secondly, we're putting together a portfolio of ideas for transportation electrification, which should include some quick wins and a five-year portfolio of projects and programs.

This is intended to include a high level budget based on our rate impact threshold and processes for two phases of community and stakeholder engagement, which I'll talk a little bit about early – later. But the legislation puts a cap on the impact that our efforts in transportation electrification can have on rates. And then finally, we'll be requesting a change to city law that will enable us to more flexibly develop programs in the future.

#### Slide 63. Step 2: Engage Underserved Communities

Emeka Anyanwu: One of our most important challenges and lessons learned, as I mentioned earlier, is that we should prioritize community engagement. And so I talked about equity earlier. You know, we want to make sure that we are racially inclusive and that we put a highlight improving and engaging underserved areas early and often. So we're addressing this by conducting two phases of community engagement.

Our first phase, which we're actively working on as we speak, is getting feedback from community leaders on our strategy. And so, we're out in the community talking to folks, holding public meetings, engaging community-based organizations to get feedback.

The second phase which will occur both initially and on an ongoing basis as we execute the plan will be engaging the community on program-specific development after our action plan has been approved by council and as we execute it.

#### Slide 64. Step 2: Other Lessons Learned

Emeka Anyanwu: So, a couple other lessons learned. You know, we certainly have learned from past efforts that it's important to have a sense of urgency for developing this plan and beginning to execute the plan because we want our customers to see these positive outcomes sooner rather than later.

We also need to be diligent and disciplined about managing the scope of outcomes and avoiding scope creep as we do this. We really can't afford to boil the ocean as the saying goes if we want to see positive outcomes delivered for our communities.

And then finally, one underlying lesson that we think about as we go forward with all of our work is to lean towards structural solutions and systemic solutions and recognize that, you know, things like incentives and payouts and those other kinds of enablements are only part of the solution. They're only part of what it takes to facilitate and enable transportation electrification.

#### Slide 65. Transportation Electrification Action Plan: Timeline

Emeka Anyanwu: So, this last slide here just shows our work plan to getting – for getting us to the point in time where we expect to achieve Council approval of our transportation electrification action plan. And we are expecting and anticipating that, you know, if our timeline holds as you can see, we will be achieving that approval sometime in the early third quarter of next year – or early second quarter, I'm sorry, of next year.

#### Slide 66. Emeka Anyanwu

Emeka Anyanwu: So, that's it for my prepared remarks. You can see on the screen my contact information. I'm certainly happy to engage with anyone who's interested in the work that we're doing here in Seattle. Thank you.

Andrea Denny: Great. Thanks so much, Emeka.

## VIII. Poll 3

Andrea Denny: And just before we jump into our Q&A, we are going to do our last poll. And if people could go ahead and type questions into the Q&A box as well, maybe when you're done with your answering the poll. But the last question we have for you is which of these barriers to wide-scale EV deployment are you facing in your jurisdiction? And again, you can select more than one answer here. The choices are: electric vehicle supply equipment (EVSE) permitting, demand charges and other cost issues, equitable access, stakeholder awareness and buy-in, impact assessment and emissions analysis, incentive options and sustainable program design, other, and again we encourage you to type that into the Q&A box if you select it, and not sure or none of the above.

All right. It looks like those answers have slowed down. So we can go ahead and end the poll. So it looks like the most popular answer with 41 votes was stakeholder awareness and buy-in, followed by demand charges and other cost issues with 34 votes, incentive options and sustainable program design with 33 votes, equitable access with 32 votes. So all three of those coming in fairly close together. Fifteen folks were not sure. And then we had 10 votes for impact assessment and emissions analysis, nine votes for other, and five votes for EVSE permitting. So thanks very much. Hearing the barriers you're facing is helpful to us and thinking through what types of resources and future webinar topics we might want to consider.

## IX. Question and Answer Session

### Slide 67. Question and Answer Session

Andrea Denny: So we are going to get started on our Q&A session. You can continue to type in questions. If we don't get to everything today, we will try and have the speakers answer those questions in writing and post them on our website.

But I thought I would start with just one or two questions targeted to all three of our speakers and maybe we can just answer them in the order that you presented just to avoid any confusion.

So the first, I think, some of our speakers touched on very quickly but, you know, wanted to give you a chance to elaborate on it a little bit more, how electric vehicles can be used within the grid as an energy storage resource and whether you know of any examples of that that you can recommend people check out. Erika, did you want to take a stab at that?

Erika Myers: Yeah. So, I would suggest taking a look at some resources that are available online from folks like the Electric Power Research Institute has done quite a bit on vehicle-to-grid. But there's also quite a bit of activity going on in Europe and in Asia, particularly Japan. There's quite a bit of work that's been done especially in the United Kingdom (U.K.) on looking at early deployments of vehicle-to-grid opportunities.

We are starting to see some utilities here in the U.S. that have made announcements about vehicle-to-grid. I know that Ikehu in Hawaii had a vehicle to grid (V2G) program for specifically as backup for a home application that was more like the V2H which is vehicle to home. But we're still pretty much in the early stages of leveraging the on-vehicle battery for grid purposes. We see a lot of interest in using the batteries on school buses for V2G just because of their flexibility, especially in the summertime, to be connected using the batteries for the storage purposes.

It'll be a little bit more difficult, I think, for high volume using vehicles like within certain fleets, especially delivery vehicles or residential I think just the size and the complexity of leveraging residential applications could be more nuanced. But certainly that's something that we see as an opportunity set in the future. And there will be a lot of steps to get to that stage. So that's why a lot of our research around load management up to this point has been focused largely on managed charging, which is a little bit more a way of traditional demand-response types of benefits for energy storage but less on the, you know, pushing out into the grid like you could with stationary storage.

Andrea Denny: Great. Thanks, Erika. Hanna, did you have anything you wanted to add?

Hanna Terwilliger: I'll just – Yeah, I mentioned that our largest utility, Xcel Energy, they're starting to look at, again, the school buses. I think that's where they've indicated interest. And then I'll also just mention, I think there's the, you know, there's the vehicle-to-grid. But I think you can also look at electric vehicles as a grid resource aside from the ability to provide electricity back to the grid, for demand flexibility, to shift around when the electricity is being used, especially in a place like Minnesota where we have a large amount of wind, it can be used to prevent wind curtailments. Then you soak up that extra energy overnight while it's less expensive.

And then even doing other types of grid support are, of course, possibilities, even if it's not selling that electricity back to the grid. So I think thinking about EVs as a grid resource goes beyond just the vehicle-

to-grid capabilities and looking at kind of holistically the other types of grid support that EVs can provide.

Andrea Denny: Great. Thanks. Emeka, there's something you guys are looking at in Seattle?

Emeka Anyanwu: Yes. And to sort of echo what all of my colleagues have said here from the other speakers, just the one thing I would layer on is that one of the considerations we have in Seattle, given our vantage point, is the ability to leverage those resources such as, you know, school buses or even transit buses as community resources in the event of an emergency, some kind of a, you know, natural event or disaster or something that leads to, you know, widespread infrastructure damage and/or outages.

And, you know, those, you know, schools or even transit or fleet depots can be gathering spots for communities. And so, the ability to utilize those as community resources in the event of an – of something like that is something that we also have factored into the way we're thinking about this.

Andrea Denny: Right. Thanks so much. So, one more question for the three of you. Which is whether you are aware of or you're – if your – you know, for Emeka, if your utility is facing this, are there any very localized transmission impacts that you're seeing from unmanaged charging, you know, if a particular neighborhood might have a very high penetration of EVs, are you dealing with any transmission constraints or issues? So again, Erika – Let's start with Erika. Is this something you're hearing from the utilities that are part of SEPA or has it not really been an issue?

Erika Myers: Yeah, absolutely, our utility members are looking into this issue. We actually highlighted in a report that we did a few years ago that based on some analysis done by the Sacramento Municipal Utility District that they experience a high penetration scenario of a quarter million EVs and their service territory they anticipated they would need to replace approximately 17 percent of their pole mounted transformers at a pretty high expense and many millions of dollars to replace.

So, they saw as more and more EVs came into their service territory that in combination with rates, they could use managed charging as a way to minimize those pocket costs for system upgrades. And we are – we have had anecdotal conversations here and there with utilities that are seeing impacts from clustering in certain parts of their service territories.

Andrea Denny: Great. Hanna, is this something you're hearing from the utilities in Minnesota?

Hanna Terwilliger: We haven't heard anything specific. You know, there was an anecdotal evidence not of a distribution upgrade, but we did have one municipal utility that spoke at one of our presentations that said, oh, you know, "We knew when this one household bought two Teslas because suddenly their monthly consumption doubled."

So, especially in small utilities where they have a lot more awareness, they could tell, but it wasn't a – didn't cause a problem for them. So we haven't heard of any issues. We are tracking that through our Transportation Electrification Plan. And then of course, we're working to make sure that we don't ever have to – that we don't get to that point by encouraging the smart rate design and then looking into managed charging as well.

Hanna Terwilliger: Thanks, Hanna. Emeka, anything you'd like to add here?

Emeka Anyanwu: Yes. So, a couple of things that I will say. I mean, I think, again, once again I'll echo what has been said. We are not tracking any specific system impacts from the adoption of electric

transportation. I think we generally feel like we are in a position to be able to respond to those favorably. One other thing I will say that, you know, this is part of a picture for us, you know, one of the things that we are contemplating here in Seattle is really the architecture of the system of the future.

And so, we are thinking about and looking at how we scope what that might look like and how do – how we plan a transition to really what will be probably a new transmission and distribution (T&D) system architecture that looks pretty different from what we have today. And that includes not just, obviously, electric transportation, but also all other kinds of technologies and resources.

One other thing that I will say, which speaks to our value of equity that I talked about in my presentation, is that as we think about the way utility infrastructure costs are spread out and paid for, we are very conscious of the fact that the – frankly, the early adoption of electric vehicles specifically is very concentrated in populations that are very wealthy and very white. And so, that is just a fact of sort of social reality. And so, what we try to do is think about how – as we react to those infrastructure costs, we are being conscientious about making sure that we are managing that cost causation and being equitable about how the utility invests to prepare for those transitions.

Andrea Denny: Wonderful. Thanks for making those points. I'm going to turn now to a question for Erika. We actually had a couple variations on the question come in, but basically asking about your experience or what research you may have seen about consumer acceptance of the utility having control of one and how their car is charged, you know, and are there financial incentives that are needed or like EV specific rates to kind of encourage participation in those managed charging programs and give up that control?

Erika Myers: Yeah. That's great question. And I'd encourage everyone to take a look at the Electric Nation report that was just published in the U.K. That was probably one of the largest managed charging studies that has been done to date and essentially is roughly about 600 or 700 residential households that were participants in this managed charging pilot program.

And they did a whole host of customer satisfaction and surveys. And what they found was that, generally speaking, the majority of their customers didn't care if their charge was moved as long as they had what the charge that they needed when they used the car the next day. So, they were less concerned with when it was being charged and who was controlling it than it – than they were about having the access. And this is not just limited to the study. I've heard similar types of findings from many other managed charging programs that have published results.

I encourage you to also take a look at Avista Utilities' Managed Charging Report that they just published a couple months ago. It does detail that as well as the BMW i3 charging pilot that was done with Pacific Gas and Electric Company (PG&E). So all three had the same general conclusions that customers were fine as long as they had an ability to opt out of a charging event, as well as – so having some control over that in the event that they did have something that they needed to, you know, drive to out of their traditional charging hours and things like that. But otherwise, generally speaking, people are fine with it. And was there a second part of the question?

Andrea Denny: I think that sums it up. I think that's fine.

Erika Myers: OK.



Andrea Denny: I just kind of condensed a couple questions, so it's probably a little overly proposed in framing it. So I'm going to turn to a question for Hanna, which is asking about the standard of review that the PUC uses to evaluate the utility EV pilots and other, you know, utility EV programs.

Hanna Terwilliger: So it depends a little bit on the type of pilot or projects that we're seeing. If there's not ratepayer funds being spent. So especially in our residential charging pilots, that the costs are completely borne by the participant in the pilot, so they're paying for their own charger. They're paying for their own sub-meter. And so in that case, it's a little bit – it's kind of just looking more, if the customer is going to save money? Is it widely supported by our stakeholders? And then in instances where there are ratepayer expenditures, the Commission in its order, looking for our generic docket talks about using cost benefit methodologies, if there is a large expenditure of ratepayer funds.

Thus far, we've had a lot pilot projects and so the Commission has looked at those to see if what's needed to be studied, how that's going to impact future rollouts and looking at it from a data collection point as well. But the majority of what we've had come through so far have been revenue neutral proposals, and so we haven't had to worry about the expenditure of ratepayer funds.

Andrea Denny: Great, thank you. I'm going to turn to a question for Emeka. So you talked quite a bit about equity. And I just wanted to know if you could provide a few additional examples or a little bit more elaboration on how you're working to extend benefits to underserved communities?

Emeka Anyanwu: Sure, so – I mean, I think that is, as I said, still evolving. We're in the middle of having those conversations, but sort of in a manner of speaking what we are trying to do is we're looking at a couple different things. We're looking at pilots that focus on access to- and availability of- charging infrastructure in underserved communities. And so we are running an EV charging pilot right now looking to try to get – right now we're just over 20, about 22 electric vehicle charging stations installed throughout our service territory. And we focused many of those in what we would consider underserved or historically underrepresented communities.

We are also looking at some pilot work around residential charging, both for our low income customers, but also even for access to charging for folks who are not homeowners. So those are a couple of different things in a couple of different ways where we are trying to create opportunity, trying to expand opportunity for some communities that might otherwise get left out of the transition.

Andrea Denny: Wonderful, thank you. And another question for you Emeka is how you – so, you know, today we've been talking about transportation electrification, but you could touch briefly on how this fits into and whether you have the transmission capacity to address a broader electrify everything strategy, you know, in like two minutes or less.

Emeka Anyanwu: Thank you. That actually is a really great question. And I think the answer to that is to be determined (TBD), right? I think specific to Seattle we don't have any sort of foreseeable concern. But I think they're regionally both in the Pacific Northwest and sort of the Western United States on a larger scale there is very much a conversation going on about sort of the abilities of our existing interstate transmission system to accommodate the kinds of energy transfer impacts that might happen in a fully electrified future. So, I think that's a “to be continued” situation.

Andrea Denny: Great, thanks, Emeka. I have another question for Hanna, which is, you know, there's not always very broad participation in some of these PUC proceedings and working groups. And I was wondering if you have any thoughts or suggestions or recommendations of how to better involve municipal municipalities across the state or, you know, across other states in those PUC proceedings?

Hanna Terwilliger: So in Minnesota, we are fortunate to have a very engaged stakeholder community. I will say a lot of our cities outside of our large metro areas are in cooperative or municipal utility service territories. But our utilities, we see is important for them to be reaching out to their local governments. And then we also have, at least in the metro area for Minneapolis, St. Paul, our Metropolitan Council will track some of these efforts. And then we have a number of stakeholder groups and nonprofits that routinely engage with stakeholders on behalf of our utilities.

So while we're not necessarily running our own stakeholder outreach process, that's not historically been something that the Commission has done, we do direct our utilities to do that outreach. And they oftentimes partner with local nonprofits. We also have started to even, I would say, ventured into the 21st century and use more social media to try and alert groups to when we have new filings that might be of interest to them. And then just doing outreach through other partners as well. But yes, a lot of times it does take extra resources and so as staff here, not just on electric vehicle issues, but we do try and meet with any stakeholders, local governments just to kind of give them an overview of the PUC, how to get involved, and what types of issues that might be worthwhile for them to weigh in on.

Andrea Denny: Great. Thanks, Hanna. And then one question for Erika. Your presentation showed that sometimes commissions or legislators or other governing bodies spur rules and recommendations on electric vehicle rates, how do those entities typically work with utilities to then create and, you know, enact those rules and recommendations?

Erika Myers: Yes, I think that the question was referring to the slide that showed the utility survey of the different reasons why utilities did electric vehicle rates, and certainly having legislators or public utility commissions direct the utilities to do EV rate programs is a potential mechanism by which a rate comes about. But what we actually found was that utility-driven EV rates were more likely to be successful in terms of enrollment.

We didn't get into the – we didn't flesh out the reasons for that. But we have a suspicion that it is related to the utility investments in that load management strategy and therefore, putting into play the resources, including things like staffing and marketing to make that a success. But again, we didn't get into trying to find the reasons for that correlation.

Andrea Denny: Great, thanks. And then I just wanted to pose one more question broadly to the three of you as we, you know, get to our ending time and that's really what do you see as the most common or kind of most critical challenge or roadblock for utilities interested in pursuing vehicle electrification policies and programs? So why don't we go in reverse order this time and start with Emeka?

Emeka Anyanwu: Thank you. Well, so, yeah, I mean, I think probably the most – what I would say is the most critical challenges is one of perception, which is how folks really sort of think of the transition to electric transportation and how folks think it will be – it will come about, right? The conversation seems to lend itself oftentimes to, you know, what can we sort of incentivize? What can we pay for? What can we – what charges can we cover? As opposed to sort of really thinking about the systemic issue and trying to figure out how do we enable access to the benefits of electric transportation to the largest group of people? And so, you know, really beginning to have that conversation in a way that highlights and leans into that discussion, I think is a challenge for us, but it's an important thing to an important thing to elevate.

Emeka Anyanwu: Great, thanks Emeka. Hanna, did you want to jump in?

Hanna Terwilliger: Sure. So from the Commission standpoint, we're of course – we kind of have two goals with transportation electrification. One, we want to make sure that transportation electrification is done in a way that does not cause any adverse impacts. But then two, we also want to make sure that we're encouraging transportation electrification because it can bring further benefits to all ratepayers and to Minnesota and society as a whole.

And so as we look at that, I think one of the most important things is getting participants on either time-of-use or managed charging rates for our residential and fleet charging, because that's what's going to help bring those widespread benefits, both by encouraging higher renewable penetration and encouraging demand flexibility, getting participants lower system costs. And so thinking about the challenges, as Erika mentioned around metering, around getting customers to sign up, that's what we're really going to have to focus on in the coming couple of years as we moved from our pilot phase of a lot of programs into permit program implementation.

Andrea Denny: Thanks, Hanna. Erika, I think you get the last word today.

Erika Myers: Well, Hanna, already, you know, did a great job of I think echoing the even the need for load management and the importance of that as we think about rolling out these programs. But in a more detailed and nuanced level, I think we need to also be thoughtful about how utilities might go about justifying the cost of investment for rates, EV specific rates, as well as managed charging programs. And as an industry, we are all, you know, we all can support the development of standards and unification around standards for EV charging infrastructure, making sure that we're encouraging EVSE equipment manufacturers to use open protocols versus proprietary that will help reduce costs for implementing these programs.

We also need to make sure that we are thinking about program design. There's hundreds of use cases, when we think about the whole spectrum of different types of EV deployments and who are the users and how can we integrate them and enroll them into programs and what are the value stacks that we can use to justify the cost? There's, you know, hundreds of these. And we only have identified about 40 programs to date. So we don't have enough program examples to really come up with best practices at this point and how to even go about designing a program.

So we've all – we're all responsible here for making sure that we test lots of different hypotheses and test out different strategies so that we can find the ones that work before we see this massive uptick of EV adoption. And so we have a couple years to make – to figure all this stuff out. It's very time sensitive. So yeah, timing is crucial. So that's my final word.

Andrea Denny: Thank you, and then it's a good wrap up to point out that we're nearing the end of our time and timing is crucial. So I – There are still a number of questions that were submitted that we didn't have time to get to today. As I said, we will compile those and ask our speakers to address them and get those posted on our website as soon as possible. It'll likely be after the holidays, but we will send out an email when that material is available.

Slide 68. Connect with the State and Local Energy and Environment Program

Andrea Denny: Thanks to everyone for participating, especially to our three speakers who did a wonderful job today. We hope this was valuable and we hope to see you back in February for our upcoming webinars. If you could take a moment to fill out the webinar feedback form, you can click on this link here and that would be tremendously helpful. Thank you and with that we'll end the webinar.