

Regional Energy Resource Council Minutes

October 14, 2020

Tennessee Valley Authority Virtual Meeting

The Tennessee Valley Authority (TVA) Regional Energy Resource Council (RERC or Council) convened for the third meeting of the fourth term at 9:30 a.m. Eastern on Wednesday, October 14, 2020. The meeting was held virtually, in keeping with public health guidance during the coronavirus pandemic. The meeting recording is available at www.tva.gov/lerc.

Council members attending:

Bill Carswell, Erin Gill, Dana Jeanes, Jonathan Levenshus, Jennifer Mundt, Doug Peters, Patrice Robinson, David Salyers, Charles Snavely, Lloyd Webb

Designated Federal Officer: Joe Hoagland

Designated Federal Officer Alternate: Althea Jones

Facilitator: Jo Anne Lavender

- Appendix A - TVA staff and members of the public who attended the meeting
- Appendix B - Agenda
- Appendix C – Written comments submitted by RERC member, Commissioner David Salyers
- Meeting presentations and recording can be found at www.tva.gov/lerc

Purpose

The purpose of the meeting was to provide an update on TVA's COVID-19 response and Board decisions; to host a virtual public listening session (no members of the public signed up to make comments); to hear RERC members' views on TVA's Electric Vehicle (EV) strategy after TVA staff members' presentations; and to obtain advice from the RERC (in the form of an Advice Statement) regarding TVA's EV Strategy.

Advice Questions

The advice questions posed to the Council were:

- How should TVA partner with others to remove barriers to EV adoption in these key areas?
 - Charging Infrastructure
 - Innovative and Supportive Policies
 - Vehicle Availability
 - Consumer Awareness
- What gaps do you see in TVA's electric vehicle strategy?

1. Welcome and Introductions

- A. Jennifer Mundt, RERC chair, welcomed everyone to the meeting. She thanked TVA staff for doing yeoman's work to prepare for the meeting.
- B. Joe Hoagland, Designated Federal Officer (DFO), welcomed everyone to the virtual meeting and introduced Althea Jones, who recently was named Senior Manager for Stakeholder Relations.
- C. Althea Jones spoke briefly regarding her position and excitement to work with the Council.
- D. Jo Anne Lavender, Meeting Facilitator, provided a safety moment, recapped the June 23, 2020, RERC meeting, and reviewed the agenda and meeting protocols.

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2. Designated Federal Officer Briefing — Joe Hoagland (Presentation can be found at www.tva.gov/lerc)

Joe Hoagland, DFO, provided an update on TVA's response to the COVID-19 pandemic and an overview of TVA's August Board of Directors meeting, including TVA's efforts in the Tennessee Valley related to pandemic support and approval of extending the current budget until the November Board meeting.

Hoagland discussed mechanisms that could be considered to better manage the changing loads during the day as more renewables come on the system that are subject to weather events with a greater chance of impacting generation. One mechanism to manage that is to build more gas generation assets to manage the fluctuations. Another mechanism may be an energy exchange market between TVA and a number of utilities in the Southeast which would provide an opportunity for those who are having good output days to provide energy to those that are having intermittency issues. TVA is considering joining the Southeast Energy Exchange Market, but has not made a final decision. More information will be provided to this group as it becomes available.

Hoagland also mentioned that TVA is trying to get into the area of energy storage beyond Raccoon Mountain. He announced that TVA is starting on two transmission scale battery demonstration projects. One is a 20 MW facility with four MWh lithium ion battery system that it is using as a non-wires alternative, which is located in Vonore, Tennessee, southwest of Knoxville. The purpose is to understand the value that batteries bring to the system, how well the battery system can manage load and how well it can provide frequency and voltage support so TVA can figure out how to plan on using batteries in the rest of the system. In addition, in a power purchase agreement for solar, one of the 200 MW solar facilities will also have a 50 MW lithium ion battery which will be used to shape the load. TVA is talking to several LPCs about putting batteries at the distribution system, trying to understand the value batteries bring for them as a distribution asset and, potentially if TVA aggregates them, the ability for TVA to better manage the system. As TVA increases distributed generation on the system, the ability to manage system load at the transmission and the distribution level will be critical.

On December 1, TVA intends to hold a joint RERC and RRSC (Regional Resource Stewardship Council) virtual meeting to discuss TVA's 2019 Sustainability Report. TVA would like Council members' input on gaps in the 2019 Report and to help TVA think about what it needs to do to improve the report. Council members will receive more information soon, and were asked to hold the date.

QUESTIONS

Jonathan Levenshus asked about transparency related to the regional energy exchange concept, how stakeholders would be involved, and whether trade and price information would be available to the public?

Hoagland: A lot of it is still being developed. In terms of the actual mechanisms, there will be an electronic platform that will be developed that will allow people to voluntarily post available energy and prices for that. Utilities will have the opportunity to purchase that for their system. Regarding details of how pricing will be released, I am not sure yet. The best way to think about it is: Everyone wants to equate it to a market you would see in an RTO, but it is going to be much more like what you would see in a balancing authority – balancing energy between regions during the time of day. It is not a competitive bid process but more of a “what is the excess energy you have available that can help balance the system?” We will go through our normal environmental assessment process once we get a little clearer about what it is going to

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be and how it will work. Regarding what other companies do, I am not sure yet. There are multiple jurisdictions involved with multiple commissions. Then, eventually, the whole thing will have to go to FERC. We have started some initial conversations with FERC, but that will have to continue.

Bill Carswell asked if there was an opportunity to talk about new topics and how long the batteries at the Vonore facility will provide back-up power? He also applauded TVA for exploring this technology.

Hoagland: 40 megawatts capacity is available and can operate for four hours.

Joanne Lavender added that the agenda does not have a new business section, but new topics could be considered for future meetings.

Charles Snavely asked about issues with reliability or planning for the future related to the exchange concept.

Hoagland: This is definitely planning for the future. We do not have enough solar on the system yet to see flexibility. Based on conversations in developing the IRP and what we are seeing from customers, we expect several thousand megawatts of solar to be coming online over the next few years, which will eventually begin to impact the system. We are getting ahead of the curve and managing it before it gets here.

3. Electric Vehicle Opportunity (Presentation can be found at www.tva.gov/lerc) — **Drew Frye, TVA Transformative Innovation, and Travis Reid, TVA Commercial Energy Solutions**

Drew Frye, in TVA Transformative Innovation, led off the presentation by explaining that he and Travis Reid would cover the impact of electrifying transportation, background on EVs and the market, consumer research insights, the EV roadmap and barriers to EV adoption, and how TVA and stakeholders can remove market barriers.

Frye said that TVA is focused on electrification in transportation because it helps reduce emissions, use energy more efficiently, balance the power system to keep rates low, keep investments local, attract economic development with EV production and suppliers, and drive sustainability. He noted that:

- Transportation is the largest source of carbon emissions and the largest sector that does not use electricity now.
- 90 percent of carbon emissions are from vehicles, and over 80 percent of the energy use is transportation as well.
- Looking at fuel economy equivalency, EVs are over 100 mpg on efficiency compared to a gas vehicle at 34 mpg. It is more efficient, which helps on the emissions side. It also leads to savings from fuel and maintenance, the more efficient the vehicle is.

He noted that EVs also encourage economic development, and the EV market provides a tremendous market opportunity for the Tennessee Valley. There are more than 5 million cars and pickup trucks on the road in the Valley, and there are also commercial trucks, buses, tractor trailers and other vehicles. If just 4 percent of the cars and pickup trucks were EVs, the benefits would stack up over five years, leading to a 4 million metric ton CO₂ reduction as well as more than \$600 million staying local, either with local utilities or in consumer's pockets due to reduced gasoline and maintenance costs.

Frye provided a 10-year retrospective view on EVs, noting that in 2020, as compared with 2010, the EV market now offers more choice, lower costs, more range, better performance and more availability. He also noted that EV sales have increased, with more than 1.5 million EVs on the

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road now, and that electrification is growing among vehicles such as buses and commercial fleets, although large vehicles have different barriers to adoption. TVA's EV market is playing catchup, with its 14,000 EVs in the Tennessee Valley, which is well below 1 percent of the marketshare.

What are the barriers to EV adoption in the Tennessee Valley? What role can TVA play in increasing those numbers?

At this point in the meeting, TVA staff member Travis Reid talked about TVA's efforts to understand consumer concerns and to determine ways to position TVA and local power companies (LPCs) as innovative leaders in electric transportation.

For more than five years, TVA has been tracking consumer interest in the EV market to understand how to break barriers to EV purchases. Consumer interest has been flat in terms of purchasing or considering an EV. In October 2019, TVA set out to better understand TVA customers' views and thoughts on electric transportation. TVA benchmarked the EV market in Austin, Texas, which has a similar regulatory environment to the Valley's and has a service territory similar in size to Nashville Electric Service, which is one of TVA's 153 LPCs. Austin has as many EVs in its service area as there are in the entire Tennessee Valley. After its research in Austin, the team engaged consumers in Nashville in in-depth interviews and then developed core insights.

The TVA research team involved a variety of other stakeholders as well, including TVA's fleet managers, several LPCs, school systems, city and state governments about sustainability plans, state agencies and businesses. After extensive brainstorming, concept development and the building of 21 prototypes, the team has been working on eight experiments. The group also interacted with five people to gather consumer insight.

Reid noted that consumer insights from the team's research include that:

- EVs feel risky. Consumers want to make sure they are making the right decision from a financial standpoint, and they have a lot of questions about how to charge EVs, how far EVs can go between charges and what the charging infrastructure is like in rural areas.
- There are people whose motivation to buy an EV is environmental, but they question if the benefits are there. They also are concerned about the battery lifespan.
- Many people in the Southeast drive trucks, and they do not feel like an EV car is large enough to carry their family. Some people think EVs are expensive, and they would prefer to buy a used car rather than a new one.
- People who the team spoke with knew very little about EVs.
- EV owners form a unique network. They leave notes on each other's cars, let strangers test drive their cars to get them interested, and often are more informed than the folks at the dealerships.

Additionally, he noted the following insights learned about dealerships:

- It takes about three to four times as long to sell an EV as a traditional car, and a lot of times the OEMs do not give as much of a sales bonus compared to other cars.
- A lot of EVs are sent to zero-emission vehicle states, so a lot of customers need to buy an EV sight-unseen if they want to get it in the Tennessee Valley.
- There does not seem to be a push from the dealerships to sell EVs.
- The role of the car salesman is shifting as consumers are purchasing online.

Reid also explained that the following business insights that were uncovered in TVA's research:

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- Public companies are curious about EVs but hesitant to invest because they are concerned about whether the technology is there to meet their needs and they are concerned about their budgets.
- Private businesses are willing to take advantage if it will put them ahead of the curve with their competitors, but they would like to see the infrastructure and partnerships to make it happen. Some of the transportation companies, the infrastructure might not be quite there yet for them to get as far as they need to from one truck stop to the next.

Based on TVA's research, three key factors for consumers are:

- **Awareness.** We are going to have to invest in the awareness piece and offer people reasons to care and pay attention.
- **Access.** We need to make it easier to buy and to own EVs. The charging infrastructure is a little bit of an issue. What does customer ownership look like?
- **Amplify.** Owners need to be rewarded and we need to grow them as a source of support.

In the next couple months, the TVA team is launching a new website with information for buyers and sellers so that people can understand the total cost of EV ownership and the available options. The team is working on an EV awareness series and is looking at launching an EV ambassador program, a think tank that helps build rapport between current EV owners and possible purchasers.

At this point in the meeting, Mr. Reid asked the RERC members to take the poll.

In response to the question, "Have you driven an EV?," RERC members answered:

- 20 percent — "Yes, I own an EV,"
- 40 percent — "Yes, I tried it and liked it,"
- 10 percent — "Yes ... it's not for me,"
- 25 percent — "No, but I want to drive one,"
- 5 percent — "No, not interested."

In the country, less than 1 percent of the population owns an EV, so the RERC is ahead of the curve.

In response to the question, "In one word, what keeps you from buying an EV right now?," top concerns from the RERC members included:

- Charging,
- Cost,
- Range, and
- Covid-19.

These answers are consistent with answers from across the Tennessee Valley.

4. **The EV Roadmap — Identified Market Barriers** (Presentation can be found at www.tva.gov/erc) — Drew Frye, TVA Transformative Innovation

Drew Frye of TVA described the recently developed EV Roadmap. Over a year ago, TVA started working with over 30 organizations that are EV stakeholders – companies that make EVs, make charging stations, sell the electricity. The partners came together and went through a process to look at the EV market compared to other markets and created a road map for increased EV adoption.

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EV Roadmap identified four major market gaps or opportunity areas which can increase EV adoption by addressing these barriers:

- Charging infrastructure availability (range anxiety),
- Innovative and support policies (federal, state, local, utility companies),
- EV availability and offerings (available vehicles), and
- Consumer awareness.

Charging Infrastructure Market Barrier

Frye explained that “range anxiety” is consistently a top consumer barrier. He noted that the current charging infrastructure is unstandardized and inconsistent. There is often a lot of distance between charging stations, particularly in rural areas. He noted that there are a lot of growing pains to building a charging infrastructure from scratch.

The team found that in other areas of the country where EV use is growing, states, utilities and industry are coordinating and collaborating to build regional systems to facilitate travel. In those areas, utilities and industry are supporting home and around-town charging stations, and there is a lot of state support for charging stations between cities. Providing people the ability to travel between states is important in growing EV use.

Looking at what TVA and stakeholders can do, Frye said there is a real need for leadership in this space. The partners can create a foundational charging network that allows people to drive their EV everywhere they want to go.

Policy Market Barrier

Top EV markets (West Coast, Colorado, some Northeast states) are boosted by strong policies at the state, local, utility regulatory or utility levels. But Southeast states are less inclined to push EVs. There are some states that have zero-emission vehicle mandate programs. They have policy mandates forcing automakers to sell more electric vehicles.

Looking at what others are doing, states, utility regulators, local governments and utilities are setting supportive policies and programs. This could be anything from incentives to mandates to local ordinances that make cities EV-friendly, as also utility investment approval and rate designs.

Looking at what TVA and stakeholders can do, partners can set and support innovative policies in this space. On the utility side, TVA and local power companies can have a central role in doing that. We can set supportive policies for rates and regulatory determinations and clarifying things between TVA and the local power companies. And, then, we will leverage stakeholders to create positive EV policy guidance at the state and local levels.

EV Availability & Offerings Market Barrier

On vehicle availability, markets that thrive have vehicle choice, competition and inventory. Limited markets struggle with having affordable EVs available for folks to test drive and purchase. Of the 25 best-selling cars, only one has a plug-in option today.

Looking at what others are doing, they are working on the availability of other vehicles either by state mandates, which are most impactful, or also by automaker and dealer incentives, rideshare programs, and other ways to bring more EVs to the market. You also see large companies that have fleets looking at how they can electrify their fleets of trucks and vans as well as automaker and utility partnerships.

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Looking at what TVA and stakeholders can do, we can convene. We plan to engage with local automakers to bring more EVs to the Valley. We plan to engage with automakers that make EVs here or that plan to make EVs in the Southeast to collaborate to investigate larger vehicles for those EV opportunities.

Consumer Awareness Market Barrier

Awareness of EVs (the benefits, the viability for everyday use) is relatively low and has been unchanged in the past few years. This is a major, multi-year consumer decision, and automakers and dealerships are currently unprepared to handle the education associated with EVs.

Looking at what others are doing, they are driving awareness and education through digital marketing campaigns, online tools, social media, multi-media campaigns, and ride n' drives.

Looking at what TVA and stakeholders can do, we can boost that consumer-focused efforts to educate, inform and promote EVs in our area.

What Are We Missing?

All four of the market gaps are equally important, and they are all interdependent. TVA's role and EV stakeholders' roles may be different for each of the market gaps. We are interested in what we could be missing and what the group would encourage TVA to focus on.

Questions and Discussion

Bill Carswell:

When I talked to Stacy Cantrell of Huntsville Utilities and asked her about my vision for solving the range problem — which is that every Waffle House, every Cracker Barrel, and similar facilities, would have a couple EV charging stations, she said the problem is that only local power companies are allowed to sell electricity to a consumer. You mentioned encouraging third-party investments. How do you do that if the third-parties can't make revenue. What is your vision for solving that issue in order to put in this infrastructure?

Frye:

We have talked with charging station companies and folks looking to develop charging infrastructure. We have heard their pain points, and it falls into a couple of categories. One is that electricity resale question and one is rate design specifically for charging infrastructure. The majority of states through their regulatory or legislative bodies have allowed the resale of electricity to charging stations. We are working toward bringing a recommendation to the TVA Board to look at that. That is something that is bound up in the contracts between TVA and local power companies, so we are looking at contractual changes that would enable that consumer pricing. We have definitely heard that, and it is something we are looking to correct on the policy side of things.

The second piece is the rate design. We have heard from charging station developers that demand charge rates and rates that were designed without EV charging in mind are cost prohibitive. We are looking at rate structures that are designed with low use, high power, fast charging in mind, and building those rates from the ground up should be a lot more attractive for folks that are looking to build charging stations. Because, simply put, our rates were made with businesses and other folks in mind before EV charging was a thing. We have used real world data to look at rate design options for charging stations. The third piece of that is that we are encouraging local power companies to get in this game as well by being sure that our regulatory stances encourages local power companies to engage and invest in the public charging infrastructure as well.

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Lloyd Webb:

Early on, in the first or second slide, you listed the benefits of EVs. One was improved efficiency. But, my recollection was, if you look at efficiency across the supply chain, that does apply to renewables, even when you include line losses in batteries, etc. My recollection was that it doesn't apply when talking about fossil fuel generation. Is that correct?

Frye:

There are some very thorough analyses out there that study the emissions and efficiencies associated with generating a fuel, building a car and fueling that car in operation, whether that is pulling oil out of ground, turning it into gasoline and putting that into a gasoline car and using it, or whether that is electricity generated by a utility or renewables, putting it in an electric vehicle car and operating it. There are detailed studies that look at that. The efficiency of electric drive vehicles are just so great. Electric motors are so efficient that it compensates for losses of charging a battery, the losses associated with generating the kilowatt hour and delivering it to your house. It really is an efficiency-positive.

Webb:

Yes, and my recollection was, though, that when you look at converting either coal or fuel oil into EV power, that it wasn't more efficient.

Frye:

I think it is looked at on the emissions side and the efficiency side. I think everything I have read is that it is a net positive for electric vehicles.

Webb:

I have seen those studies, and they reference California as an example and that kind of fuel mix in the generation. Again, I am thinking I saw a specific example where you don't mix all of your generation together, you look at it by type of generation. If you have any data on that, I would like to look at it, specifically on a generation type efficiency.

Frye:

Sure. We will follow up

Charles Snavelly:

I had the same reaction that Bill did. I have had contact in the past with you all on your electric vehicle program when I was in the state government. I am probably the only person to put down that I haven't driven an electric vehicle and didn't really want to. That is not because I don't think they are good, but I look at it from a more individualistic approach. I like electric vehicles because they accelerate well. I like them because they have less parts, and, theoretically, they should be cheaper. When they fix the battery issue, I think they will be cheaper.

I've got, I don't know how many, independently owned gas stations within five miles of my house. You keep talking about this from a policy standpoint or from a public infrastructure standpoint, it makes me feel like, one, I am being sold something rather than something I want to buy, and number two, that it is some governmental thing that eventually you are going to figure out how to stick it to me. All of the electricity basically comes from TVA in this area, so there is a control on the price. The price is going to go up as soon as I get rid of my gasoline vehicle.

The biggest thing is, I am from the mountains, and I am not going to let my wife run out of fuel somewhere 50 miles from a charging station. I think you have to look at how to monetize the sale of electricity so that all the people who own gas stations who want to put in charging stations. It has to be fast. I can fill my vehicle up in 5 minutes, and I can go anywhere I want in America. I can't do that with an electric vehicle, and until that time comes, I am not buying one. If the government tells me to buy one, I'm not buying one.

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Look at it from the standpoint of how do you make it create its own market. Not try to force market, but figure out how everybody who has a gas station wants to put in charging stations. Then I would feel comfortable and would like to buy one, and I would know that Elon Musk figured out that you can make a good-driving electric car. I would buy it then, but I won't buy it until that time. We did this in Kentucky, where the definition was that only a utility could sell electricity, and we changed that. I think that is key.

Frye:

I think you have outlined several of those four big barriers such as charging infrastructure. Something that also came up in Travis's consumer research is that how you message the benefits to folks is different. Some folks are into it for the smooth, fast acceleration and some folks are into it for another reason. It is a big challenge, the consumer side of things. All four of them are a big challenge. Thanks for the comments.

Jonathan Levenshus:

Thanks for the presentation, and I also appreciate the research shared by Travis. Following up on something you said to Lloyd, how does TVA view vehicle charging as a way of incorporating more solar onto the grid? If so, how does that impact TVA's plans for solar acquisition? We keep hearing about TVA's plans for solar acquisition. How does putting more solar onto the grid relate to the vehicle charging issue?

Frye:

The two can be very complementary. If we look at other areas like California, they have taken the unusual approach of trying to coordinate EVs charging at the same time the sun is shining, because they end up having excess solar on the system. When solar comes on, as you add more solar, and we are looking at all sorts of ways to do that — whether it is local energy market, or energy storage on the system, or whether it is coordinating the uses of electricity like EV charging to coincide with the renewable generation— they all need to work together. EVs are such a small number right now, and each individual EV is such a smaller number related to TVA, that for a while, there is not going to be a lot of impact to the TVA system. We looked at different adoption scenarios in the IRP. We looked at those impacts and also the different scenarios of adding renewable generation at the same time in the IRP scenarios. I definitely think that is a possibility, I definitely think that is a future activity that will be done when we have enough EVs that we can manage charging and when we have enough renewables on the system that warrant some other actions.

Joe Hoagland: TVA is managing the portfolio from the IRP perspective, and we are going to continue to green that portfolio over time. Right now, renewables are being driven primarily by customers that are in that commercial segment that need renewables for their own goals. As we get more of those renewables in and we get the system to where it can manage and balance those things well, the net result will be that whatever you are charging your car with will be cleaner. I don't know that we have any plans for any time in the immediate future to say that we would put, specifically, solar energy, for example, to just car charging. The goal is to clean up the whole portfolio.

Jonathan Levenshus:

Is TVA anticipating directly installing any public chargers?

Frye:

No. We are looking at partnerships with EV stakeholders across our region. We can facilitate that happening. We see a need for leadership coordination and some programs to help push that along.

Erin Gill:

This has been really interesting, and I appreciate all of the work Drew and Travis, have done. It makes sense to me that TVA is not envisioning directly installing and managing chargers. At the same time, we are trying to shift the market so that private entities — whether that is an EVgo or

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a private gas station or charge point — find it more economically competitive to enter the space and enter, presumably, agreements with property owners, whether those are commercial entities or gas stations. Are you are looking at a rate that would bake in some of the infrastructure cost into the kilowatt hour pricing, so the barrier to entry is lower?

Frye:

We are looking to encourage the market – those folks that are the EVgos, the Electrify Americas, builders of charging infrastructure. We also want to encourage third parties who own and operate restaurants and gas stations to install EV charging. We also want to encourage local power companies to become involved as well. The rate design is really about reallocating the cost to serve the electricity. We understand that charging stations have a cost, they have their own O&M and other costs. We do not anticipate those costs as being part of the rate right now. The rate is really about the cost to serve the electricity and structuring that in a way that is more attractive for the folks who are trying to build charging stations.

Erin Gill:

Fast-charging infrastructure is a pretty intensive investment that requires usually a pretty significant upgrade by either the property owner or the EVgo private charge point developer. Level 2 charging is a much lower bar. For example, in the City of Knoxville, we have been putting in non-network level 2 chargers on public property. They are great. Our electrician does them in-house and we pay Clipper Creek maybe \$600 to \$800 a pop, and they are great. We don't recharge the power; we eat the cost, because it is a service to residents and visitors. Is the vision here that we see a networked level 2 buildout, or is your focus at this point very much on that fast-charging infrastructure that would be for the 50-mile, fewer and farther between, but when they are there, they are predictable, reliable and you have created a market incentive to actually deploy them in partnership with the private sector?

Frye:

You'll need a mixture of all of those charging levels. We see a real need in the coordination to look at the fast-charging across state lines, across regions, and really bring in that coordination and leadership. But we see local leadership in cities, installing level 2 local charging stations with local power companies now. The bar is so much lower on level 2 charging stations, that we think that is an option for folks to do right now. As we communicate the benefits and communicate what folks can do to encourage EVs, some of that might happen on its own. We see local power companies already starting to get into that space and helping around their communities. But their community stops at the border of their service territory, so we are looking at it at a much higher regional level and working across those boundaries.

Joe Hoagland:

The business model on the level 3s has got to evolve. If you think of it somewhere down the road, TVA is like the person providing the fuel, like you would see in a gas station today. But the business model that makes that gas station function needs to be effectively sorted out. If you think about it, most gas stations don't make their money off the gasoline they are selling you. They are making their money off a lot of other stuff. That is going to have to evolve over time. This is really to get people started thinking about it and enabling that process.

Chair Jennifer Mundt:

Thanked Travis and Drew. In reply to Bill's and Charles's points earlier regarding the interplay between what is likely a public utilities commission and how they regulate third-party sales, "I think we are seeing a lot of PUCs or the state legislatures reacting to that, seeing how many of these charging stations are going in and local governments or organizations eating the cost of providing that service to the public. In 2019, in North Carolina, the General Assembly made some tweaks to the statutes that allow for our utilities commission to provide for third-party sales for plug-in electric vehicles, specifically with perimeters and boundaries, keeping it such that it doesn't run amuck but it provides for a whole lot more flexibility and breathing room in this space. It was very much a reaction to greater adoption — although we are nowhere near

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California or Georgia levels — of EVs across the state and trying to meet that demand. We might see that more in a reactive versus proactive manner, but I think that is coming. I wanted to make mention of North Carolina's experience in that space.”

More questions after a break

Erin Gill:

I am interested in having some more discussion around fleet opportunities... I saw on the website that you have a couple things that look like they may be related to fleets, but I couldn't tell if that is trying to get at general market penetration or more commercial penetration.

Reid:

Part of what we are looking to do is to work with some of the folks in the Valley to help them develop the business case for what it would look like for them to bring EVs into their fleets. We are providing some technical services. We are looking to start conversations with different stakeholder groups to share best practices, what has worked, what hasn't worked as folks try to convert things like buses, regional transportation, and also plan to engage from a fleet level.

Frye:

Fleets can mean a lot of different things, from a collection of small cars that your company uses to large semi-trucks. It is important to get a stakeholder group together and understand their specific barriers and what role TVA and local power companies could play. The first round is discussion, but we have also had some hand-raisers from some interested fleets — whether they be ride shares or transit agencies that are taking that first step.

Jonathan Levenshus:

What does TVA's electric fleet look like? What are the procurement rules you have in place for buying, using or leasing electric vehicles?

Frye:

Our current electric fleet is about 10-plus electric vehicles spread out across different organizations within TVA. In talking with our fleet agency, we face a lot of the same barriers that the general public faces. We have a very large footprint across seven states. In non-COVID times, employees travel all over the place on long trips. So we are definitely interested in having a charging infrastructure that would work for our employees and having a charging infrastructure at our facilities. We have about 100 charging stations spread out among TVA facilities, and those allow our employees to drive their electric vehicles to work and to drive electric vehicles from site to site. We currently don't have procurement rules. We have federal reporting rules, where we look at greenhouse gas emissions and alternative fuel guidelines. We are in the process of talking about what it would take to fully electrify or more electrify. You see a lot of announcements from other utility companies that in next five, 10, 15 years they will be electrifying their fleets. We have definitely taken notice of that as well.

Jonathan Levenshus:

We didn't really talk too much about the worker impact. What might be the economic impact of having EV companies based in Tennessee or the Valley on the manufacturing side as well through car components, steel, aluminum? Is there data you can share on that economic impact on the Valley?

Frye:

As far as resources go, I will direct you to the Tennessee Advanced Energy Business Council. They do a report that looks at advanced energy jobs in general. It includes things like electric vehicles, renewables, and that kind of information. They try to put a number on it for the whole sector. I will say that from speaking with the Economic Development folks within TVA and at the states, electric vehicle manufacturing and the supply chain around that — batteries, components for electric vehicles — are a really hot topic right now, with folks looking to build new stuff or supply the automakers that are already building electric vehicles. There is definitely

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a big push and you see a lot of announcements. Hopefully, those announcements will be in the Southeast going forward as well.

5. Individual RERC Member Comments

Each RERC member was given time to provide comments on the Advice Questions:

- How should TVA partner with others to remove barriers to EV adoption in these key areas?
- What gaps do you see in TVA's electric vehicle strategy?

Written comments from David Sayers, State of Tennessee were read to the Council and are included as Appendix C.

Erin Gill, City of Knoxville

This has been really interesting, and I am excited at all of the strategies. I have been poking around on the website, and I am just keen on a lot of the strategies you have been working on. I hope many of them come to life, in addition to ones you are already working on. The more we can work with partners to get those out into the community would be really cool.

In terms of consumer awareness, I totally agree on the analysis based on local data for the costs of owning an EV and the environmental benefits, trying to demystify and debunk some of the myths that might be out there with local data. I think that is very important.

The other element that feeds into consumer awareness, and we mentioned featuring CEOs driving. I think that is really cool, but I would also say, let's feature families driving as well. I know they are fewer and farther between, but the more that we can have the face of electric vehicle ownership not be always just the C-suite folks, I think that will be a big benefit.

In terms of vehicle availability, I think there are some pretty cool EV models that don't always come to Tennessee or the Southeast, so trying to leverage the network of TVA and the state to try to bring those models and make sure that some of the newer models that emerge from manufacturers make their way over to this side of the country. Hopefully, we can create a market for them.

The other thing I think about when I think about vehicle availability is the used-car market, because it brings the price point down significantly and there are many of us, myself included, who feel like it doesn't make sense to buy a new car. You buy a used car and then you can take off the depreciation. Trying to figure out ways that we can stimulate that market will be a piece, too. Part of both those, consumer awareness and vehicle availability, is around rental options. I love the idea of trying to allow people to experience an EV, not just on a test drive but on a weekend, for example, where they can drive it and see if it fits with the way they do their business.

On the charging infrastructure, I have been thinking about the opportunity for coordination. TVA has already articulated the role you can play there, but coordinating aggregated purchasing of EVs, coordinating potential site placements so that those national providers can see across board where they might go and assist in negotiating those contracts so that each individual location partner isn't having to go through the negotiating and the contracting process one at a time, but rather trying to aggregate that somehow.

I will also very much echo the ecotourism opportunity. I think that is really huge, and it is a win-win when we think about placing EV fast chargers in places where people want to go, where

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they can spend money in state and also charge their car for the 30 minutes or hour that it might take on a fast charge.

Another point I will make is that the fleet opportunity is huge, and I am glad they are looking at that. You get more load for the time that you spend. If you can convert a fleet, you have multiple cars as opposed to trying to convince one EV owner to buy one car. It seems like good opportunity to insert some motivation there.

Jonathan Levenshus, Sierra Club

The transportation sector comprises the largest source of U.S. greenhouse gas emissions. The point I am taking away from this conversation today is that vehicle electrification is an essential strategy for achieving emission reduction targets, and that is something that TVA continues to hammer on and they should be commended for. Vehicle electrification needs to be a part of that strategy. Also, investing in EVs is critical for maintaining the economic competitiveness, and I think the commissioner made that clear in his comments.

There are a few areas of interest to me and the Sierra Club. I think we need to incent ways to enhance consumer demand. I think driving manufacturing across the sectors will enhance and create high-quality, good-paying jobs in Tennessee, which is something we should be supportive of. And, I think we have to invest in the building out EV infrastructure. This transition to electrification is a real opportunity. I don't think we are missing it by talking about it and by bringing it forward. I think TVA, TDEC and other stakeholders are making sure this issue is front and center.

I will leave the group with three recommendations:

If the third-party chargers don't materialize, TVA ought to step in and install and operate public chargers, particularly in areas where the EV market is emerging. Third-party companies, we have noticed in other parts of the country, are not market shapers; they are market followers. If that doesn't materialize, we should be pushing TVA, perhaps, to become those installers and operators of charging systems. It also is critical to ensure that we have equitable access to charging - poor areas, rental units. We shouldn't just be focused on the high-value locations.

Joe hit on this earlier: TVA should establish time of use or other rate structures to incentivize charging off-peak or during maximum solar output. That seems to be where TVA is headed, and I think that is a good approach. Doing demand charges for charging could depress the market, so I would be looking at those rate structures to incentivize charging.

My last recommendation would be that TVA ought to consider rebates for chargers and EV purchases to increase the availability of EVs and make sure those rebates are done equitably. TVA has done this in the past on the energy efficiency side, and so maybe that is a place where TVA could go forward on the EV side.

Jennifer Mundt, State of North Carolina

I think the others have already provided great suggestions and feedback, so I will just layer on a couple other high-level and specific thoughts in terms of partnership. I would suggest that TVA consider very strongly partnering and having collaboration with the LPCs and local governments to coordinate where infrastructure should belong and also identifying some of those vulnerable or lower-income communities that would need additional focus and attention when this sector evolves.

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In terms of developing innovative and supportive policies, and I think this recommendation speaks to all key areas, is looking at a regional approach and what other states have done, and recognizing that a lot of this work is focusing on Tennessee, but where we represent different states or pieces of different states that all are part of the Valley, and looking at what the composite of rest of states are doing in the EV space to identify complementary opportunities to build on efforts that, for instance, North Carolina is taking on to advance our number of electric vehicle registrations, shifting our motor vehicle fleet that is state-owned and other approaches that are under way. So, just looking at what is complementary across this region and not just within the state of Tennessee but how TVA, the LPCs and everybody can work with other utilities, states and local governments.

With regards to innovative and supportive policies, I would suggest that TVA build coalitions and partners to help support policy initiatives that would help spur and advance EV adoption, whether they be supporting efforts to address third-party sales concerns or identifying local or state building codes that need to be amended to address issues like number of parking spaces, location of where charging infrastructure can be located proximate to a building and how that might interfere or contend with other requirements with building codes such as ADA and other access. I know a lot of local governments and other entities are already dealing with that, so there might be good models and approaches that TVA and other partners could look to model.

Mr. Salyers and others have already mentioned the VW settlement, and I would just suggest looking very strongly at partnering with folks like Electrify America and developing this build-out of fast charging infrastructure to support the full region. Jonathan mentioned the consumers. I think it is really important that we keep very much in mind the impact on the folks in the region and within the Valley who are energy burdened and who might not see themselves as potential customers or proponents of EVs and not necessarily see how the benefits might outweigh the upfront costs, and identifying some supporting financial mechanisms that could offset the increased costs to shoulder such that they could achieve the same benefits so they are not all just for C-Suite folks.

In terms of consumer awareness, Travis and Drew mentioned that car dealers seem to be a weak space in these discussions, and perhaps TVA could help sponsor or partner with other organizations to do some training or some types of events to help build dealers' knowledge base such that it is not just people who have personal curiosity about EVs but it is more standard across industry.

In terms of the efforts that you have been engaged in thus far, 30-plus partners, I think that in order to increase consumer and general public awareness, we can look to the leaders in corporate America and specifically how many corporations have sustainability and greenhouse gas reduction goals that are built into their corporate models. There might be a space to build off that approach or building on what they have done and molding that into TVA's domain.

And then, obviously, with the high adoption rate of EVs, we need to be mindful of the unintended consequences of less funds going into highway use taxes, and manage various efforts in that regard, and to be mindful of how does that balance out in state and local coffers.

Doug Peters, Tennessee Valley Public Power Association

I will concentrate on what we are doing. We think we are doing quite a bit in the charging infrastructure space, especially through our Seven States organization. Since June 2019, we have installed 64 charging stations around the Valley, three of those include DC fast chargers. If you roughly think about June of last year to the end of this year, I mention that because we already have 46 new charging stations in our pipeline between now and April. I think it is clear

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that TVPPA, Seven States and our members very much are supportive of the electrification of transportation. And, in addition to the work we have done installing chargers, we have worked out preferred pricing with ChargePoint to the point where — I think I have this right, and I would be happy to confirm it offline — if anybody wants to buy a ChargePoint charger inside the Tennessee Valley, they have to come through us. We are the designated distributor of ChargePoint chargers now. We also have fleet agreements with all of the major manufacturers, but the fleet agreements with GM and Nissan include the LEAF and the Bolt, and our members are adding them to their fleet of vehicles right now.

TVPPA will certainly add EVs to the two or three vehicles we own, but like TVA, under normal circumstances, we are driving all over the Valley, and we are waiting for a little more infrastructure. That is, in part, why we are working so hard with our members to get some more infrastructure out there. We had a Board member last fall drive his Nissan LEAF from Greenville, Tenn., to Chattanooga, Tenn. The drive down was pretty uneventful, but the drive back was a bit arduous. He found a lot of charging stations that weren't operational. I think that is one of the things that the general public will appreciate as local power companies get into this space. I think there is every reason; historical evidence points to how well our members will deliver public charging. I don't want to say a counterpoint to something Jonathan said, but I would offer it as an option: Personally, I believe that charging is a retail function, and I think that best fits within the distribution space. That is why we are working with TVA and Drive Electric Tennessee. We have a staff member who is on the Board and Executive Committee of Drive Electric Tennessee, because we want to be involved and understand where those DC fast chargers need to be along major thoroughfares. We think our members will want to provide that charging. If they don't, we will have Seven States take a hard look at it on their behalf. And then, of course, maybe the business model doesn't work and TVA would need to step in, but I would like to suggest to everybody that we continue to look to the local power company for charging infrastructure to the extent possible.

With the extent to removing barriers, we have been working with TVA on a wholesale rate for EV charging. I think that is well under way at this point. For the other three bullet points under the first question, I am going to be forced to say that TVPPA and Seven States, between us we have 22 people. And, it is very difficult for us to do a whole lot more than we are doing in this space, based on resources, so we are going to continue to look for TVA to lead in those other three areas.

In terms gaps in TVA EV strategy, at this point, I personally believe you have kind of a chicken and egg sort of situation. It will make it easier for EVs to propagate if there is more infrastructure, but then there is an expense and an investment that has to be made in that infrastructure, and from a public power standpoint, how do you get that investment paid back? So, things like the Volkswagen money that might be used as almost grant money to support additional infrastructure. Things like that will be pretty key to doing that, and there are some policy issues in terms of who can sell electricity — at least metered electricity — that will have to be resolved. We will certainly be working with TVA to do that.

I will make one final long-term observation. Somebody asked about jobs. Certainly, there are a lot of jobs that the Valley will benefit from in terms of manufacturing and all the support behind that, but if you think about EVs, they are so much simpler in terms of the number of parts and maintenance. In the long run, we will see a new sector of jobs emerge but also — and we are nowhere near this, I understand that — but over the next 20 or 30 years, we are probably going to see a decline in the number of mechanic jobs, because EVs just don't need those kinds of mechanics.

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If you look at what Google and others are doing with self-driving cars, if that really propagates as Google suggests it would, you could see a major drop in body shops. There would be fewer accidents if we actually get self-driving cars. I might even take you to some recent movies where they show cars being controlled almost like an aircraft controller would do. So, I think this is all very interesting, we are very supportive of it, but I do think we are going to see a lot of things unfold over next 20 years that we just don't know how to anticipate. So, I mention that because I don't know what gaps there might be in TVA strategy over a protracted period. I think we will discover that as we go, but for the near term, for what my members are trying to do, I don't really see any gaps, and we are concentrating very specifically on charging infrastructure at this point.

Patrice Robinson, Memphis City Council

First, I want to share that I have really enjoyed the presentations this morning. I would love to have an electric car; the Tesla is my favorite. As it relates to the community, especially the one that I represent, I have been talking to people about this. They are not comfortable, especially people in my age group. They want a network of charging stations. I heard someone say today that they didn't want their wife to be out 50 miles away and need some charging. That is a real concern.

I also talk to people who need transportation to and from work, but they would like for it to be more affordable. I am thinking that TVA could probably work something out with the bus company or some transportation industry that we can provide some affordable transportation using an electric vehicle. It is also my belief that we need to talk about regulation around the cost of electricity. If it is low now, how do we put in place some legislation that will encourage us to keep the cost as low as possible while we also maintain a reliable electric system?

My last point is that we really need to advertise. In advertising, we need to think about people who need the economic value, people who look at their budget from a middle point of view, and then we have the high end. This is just an analogy to fears, where they have good, better, best. We probably need to look at those three components so we have something that is marketable to the whole community and not just a few.

David Sayers, State of Tennessee

The State of Tennessee greatly appreciates TVA's leadership and the staff time and funding they have dedicated to Drive Electric Tennessee. Our Office of Energy Programs has been very much a key part of DET (Drive Electric Tennessee) from its inception, and we have several staff members that are currently leading working groups under two of the focus areas: Awareness, and Policy and Programs.

The DET roadmap and charging infrastructure needs assessment have been critical to our charging infrastructure planning efforts. In listening today, that is so important for all of us. Following the recommendations of the needs assessment, we incorporated the development of a statewide public EV charging network into our Strategic Plan that has been adopted by the governor. This network is expected to cover primary interstates, some of the secondary corridors, and expand accessibility of EV charging for all Tennesseans and regional travelers. While we principally look at high-density markets being the foot in the door, one of the things that I am very excited about is actually having those charging stations in our state parks. I noted earlier today that people have rediscovered the outdoors and want to spend some time there. And then, the other part of that is in some of the rural communities, at town squares and things like that, so we have that out there to look forward to and to help promote this.

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To do this, our Office of Energy Programs is working to secure multiple funding sources. We have allocated the maximum allowable percentage — 15 percent — of our VW environmental mitigation trust allocation, a little over \$6 million, to fund light-duty EV charging infrastructure. TDEC, in collaboration with the Department of Transportation, are evaluating opportunities under the Highway Infrastructure Program to support the charging infrastructure along interstate corridors. We are going to continue to collaborate with TVA to ensure that all funding sources for public EV charging infrastructure in Tennessee is leveraged to optimize the effectiveness and eliminate some of the redundancies. While I would love to comment on the gaps in TVA's electric vehicle strategy, I really don't want to give credit to that, because I am so pleased with the work that TVA has done in moving this forward. I want to say how much I appreciate the work that TVA has done.

Charles Snavely, Commonwealth of Kentucky

Did I hear it correctly that TVA had 11 electric vehicles? (confirmed) That shows you the fallacy of these discussions. Eleven vehicles is a drop in a bucket. If TVA is not backing the strategy, I am not sure TVA believes in it. That is not a criticism; that is a statement of fact, because you've got the same issues I've got. If I can't get from Cleveland to Chattanooga and back reliably, why do I expect all the consumers in the Tennessee Valley to buy an electric vehicle?

The longer I have sat and thought about it, who benefits, from an economic standpoint and not the societal benefits? Who benefits economically from electric vehicles? It is TVA, and it is the local utilities that are part of the TVPPA, because you are taking market share from the oil industry and you are selling electricity. So it seems like the investment should be made by people who are going to receive the benefit. Even the renewables. In fact, I agree with Jonathan about this, that the utilities are getting this benefit, the renewables producers, because if taken to an extreme, if you increase that much load in the Tennessee Valley, you are going to need all the electricity that everybody can produce. There is not really competition between fuel sources for electricity.

But, maybe we are looking in wrong direction, because the most difficult thing is to get individuals to buy new electric vehicles based on societal benefits or based on anything other than is it more convenient, does it perform better, is it cheaper. To overcome all of the issues with charging for individuals, it seems like the target market should be industrial fleets, rental fleets, ride share and corporations. A lot of the large industrial customers that TVA already has that have very low electric rates and perhaps have more routine routes that they can manage.

Finally, governments. Governments are the ones that own a lot of vehicles and drive a lot of routine routes. Those seem to be easier to build the charging, easier to manage all of the charging and manage the routes such that it would be successful. I think you should really target in government and in the industrial sector more so than individuals, because that is by far the biggest lift is to get individuals is to build electric vehicles.

Lloyd Webb, Olin Chlor Alkali

The first comment I have got to make and I don't think anyone has made this comment today, but I think it is a critical comment. What we are talking about today is a subset of a global business — the automotive business. And, like any global business, if there is an opportunity for EVs, they will make sure and work with the appropriate partners to make sure that marketplace develops, and that is going on today across the world. So, I really don't see any opportunity for TVA to participate in this marketplace other than maybe doing the things Drew and others talked about today, and that is being an advocate for the development of that marketplace, facilitate events, the kinds of things that TVA does today to support energy efficiency, for example. I don't think it should be any different than that. You start handing money to commercial interest and

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others, or you try to go up against commercial interests to displace what they would typically do, it is just not a place where TVA should be participating and certainly not a place where it should be putting ratepayers' money into that.

This marketplace will develop. I am 100 percent confident of it. I know there are a lot of heavy-duty commercial interests trying to figure out how to make this marketplace develop. I know they are spending time in DC. I am sure they are spending time at the state level talking to people, trying to find some way to get these markets to develop with the help of taxpayers' money. I just simply don't see why we should be throwing TVA's money at it as well, given where this marketplace is today.

And, finally, I think there is a significant social justice issue with this as well, because low-income people are not going to be able to take advantage of this marketplace for a very, very long time. Many low-income people simply cannot afford to buy a car flat out, and I'm talking about a used car for \$2,000, a gas engine car. If they can't afford to buy them, there is no way they are going to be able to afford to buy a \$30,000 electric vehicle. Again, if you are talking about taking TVA ratepayer money and putting it into this effort, and putting significant dollars into this effort, you have a social justice issue, in my opinion.

Bill Carswell, University of Alabama, Huntsville

I think what Lloyd just said about a social justice issue is true. I don't think that vehicle availability really is in the TVA sphere. Maybe it is?

I would like to talk about the last sub-bullet first: consumer awareness. Clearly, TVA is going to have to work with their LPCs to develop a canned, boiler plate, consumer awareness campaign. I will use Huntsville Utilities as an example. I get something in my mail every month along with my bill that Huntsville Utilities sends out as an education thing, and it is very helpful. They don't overwhelm me; it is very simple and clear-cut.

You can't expect 153 LPCs to invent that wheel. That really ought to be something that TVA can say, if you want to do this, here is what we suggest. Then let them go and do it. But LPCs cannot promote electric vehicles until they have the infrastructure to support electric vehicles. That takes back to the first sub-bullet: charging infrastructure.

Most of everything else I am thinking of has been said. I want to say congratulations to TVA for even considering. When the presenter today said they are talking about modifying the basic TVA contract to make an exception for electric vehicle charging stations, I was flabbergasted. I have never known any LPC who got TVA to modify their contract. I don't mean that as a criticism. We all have contractual obligations and charters and TVA is doing a great job, but for them to even consider changing their contracts to enable charging stations is fantastic. Go guys go. I hope you win that one.

But, one way that LPCs are going to get comfortable with the electric vehicle charging infrastructure is if TVA can implement some sort of incentive program for the LPC vehicle fleets – someone earlier touched on it, what about TVA's fleets? — for their vehicle fleets to go electric, and then, they will really start understanding the challenges with distance, cost and all that stuff. That would be a great partnership to just get everyone on the learning curve a little bit steeper than we are now.

I don't know if there are contractual issues. If you can do that with municipal customers also, like the City of Huntsville, which is not Huntsville Utilities. Those are the things that would at least get the infrastructure from TVA building out to the community and TVA's first link to the

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community is the LPCs. Getting them comfortable with what it is really going to take and starting to think about it.

Another option is, can TVA form a partnership with LPCs similar to what they did in Huntsville with low-income energy efficiency partnerships? TVA provided many millions of dollars and Huntsville Utilities did a really good job of reaching out to the low-income community to improve the energy efficiency of homes. Can a program like that be set up to provide home-based electric vehicle charging equipment? It is not expensive, but it is part of the link that adds to the cost. That is something I would like to see TVA propose to its LPCs.

Due to the 30-minute charge time, even if you had a chain of charging stations, still, if traveling across the country, 30 minutes is a long time to stop for gas. We really need to build something out at places where people stop to eat, like Waffle House and Cracker Barrel. I applaud TVA for thinking about changing the contract to allow Waffle House and Cracker Barrel to set up charging stations and charge their customers. The likelihood of a contract change coming in a timely manner, I think is pretty low. I am sorry if I am skeptical, but I have worked with bureaucracies all my life. So, I see two solutions to the problem:

- You can encourage the LPCs to set up the charging stations in partnership with Waffle House or Cracker Barrel. Then, each charging station, when you put in your credit card, you are not paying Cracker Barrel or Waffle House. You are accessing an individual, unique account to the LPC. So, you are buying electricity from people who are supposed to sell it. You could do that right now.
- Or, encourage the restaurants to give the electricity for free and wrap it into their overhead. They might need to raise the price of a meal by a nickel or a dime. That is not the preferred way for me, because we are then all subsidizing rich people who have electric vehicles, but something like that.

The strategy that I see as a gap in what I saw today, and it could be because it is so far down the road, because we have to get the baby steps before we can do the big steps. But: an aggregate use of electric vehicles for peak shaving, essentially. I haven't seen anything on that, and I was wondering how that might integrate into the IRP in the next iteration.

6. Draft Advice Statement

After the individual comments period, TVA staff members and the RERC Chair created a draft starter advice statement that incorporated members' thoughts into a draft written statement. After the starter statement was presented to the Council, members offered suggestions that shaped the RERC's Advice Statement from this meeting.

Draft Starter Advice Statement

We appreciate the hard work of the state of Tennessee, TVA and the many other entities that came together to create the Drive Electric TN Roadmap. Widespread electric vehicle adoption has the potential to help the region with cleaner air and meeting carbon reduction goals, and manufacturing of EVs and supply chain already benefits the region's economy.

Overall, we support TVA's proposed strategy. TVA should continue its focus on thought leadership, convening stakeholders and enabling adoption of EVs in the Valley. As TVA partners with others to make the Roadmap a reality, together they must ensure that these efforts cross state lines.

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The Council agrees that the four barriers TVA has identified must be overcome in order to facilitate widespread adoption of EVs in the Valley. Consideration should be given to efforts in other parts of the country, social justice and overall cost impacts to ratepayers.

TVA's Joe Hoagland:

I think that is the start, and if everybody wants to include all of the other ideas, which were good ones, we can include them in the minutes, rather than trying to list every one of them here. Or, we can list every one of them here. Whichever the Council wants.

Jo Anne Lavender:

I can go through each sentence and paragraph, and group members can speak up if they have a comment or suggestion. Jo Anne read the first paragraph.

Bill Carswell:

In addition to helping the region with cleaner air and meeting carbon reduction goals, widespread EV adoption would reduce the negative impacts of stranded assets as we move into reduced energy usage and increased renewables. I have heard that TVA is starting to consider the fact that there is a problem with investments that are now not used. The reason I am throwing that in there is because that would be really important to your Board of Directors and your ratepayers, that we are reducing that negative impact.

Lloyd Webb:

Bill, the issue I've got with that is this advice statement is really meant for EVs and you are really broadening the landscape when you start adding things like that. I have got probably 100 other things that I could add related to what you have just brought into it, and I think we need to stay away from that.

Erin Gill:

I think, if I am understanding your perspective, Lloyd, there is a lot with other technology associated with distributed energy that we may want to stay away from. But I do think there is a very valid point in the sense that this is new electric load growth, and that is a very compelling value proposition to an entity that has invested in creating electricity to serve electric growth and electric load.

Lloyd Webb:

That is one of the issues I've got. We don't know if it is attractive or not, the load growth. This is all early enough in its development that we don't really know how it is going to impact it. In fact, what we may find is that it's restrictive.

Erin Gill:

The key point here is that there is the, and I don't know what evidence you are looking at that would suggest that electrifying a vehicle that is currently running off of gasoline or diesel is not adding to the electric load.

Lloyd Webb:

If somebody was to ban fracking and TVA as a result of that was forced to shut down fossil fuel generation, the last thing we will be looking for is more load.

Jennifer Mundt, RERC Chair, recommended that Council members limit recommendations to information heard in the presentations, without bringing outside information into the conversation. The Council members agreed.

Lloyd Webb said:

Everything in here I am OK with, except for one word in the 2nd paragraph, in the second sentence — the word “enabling.” I would rather have the word “support” adoption rather than “enabling” adoption of EVs in the Valley. I think “enabling” is too much of a commitment.

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Erin Gill:

I have a proposed edit for the last sentence of the third paragraph that we add “benefits” to the statement that says, “overall cost impacts to ratepayers” so it reads “overall cost impacts and benefits to ratepayers.”

Joe Hoagland:

If anyone has a “no” vote, speak up. Otherwise, we will say it is good.

There was no opposition to the change.

Jonathan Levenshus:

I don’t have a wordsmith change at this point, just a comment in that last paragraph, where I need to understand if in that first sentence we might want to say something about TVA or other stakeholders playing a part in addressing those barriers. My concern is that it reads a bit like there are four big things that stand in the way of EV adoption, and TVA can wait until the barriers are gone before pursuing EVs. So, in addition to noting that there are four problems, we should also state that TVA can help solve them and TVA stands ready to solve them or other jurisdictions are doing it. That is how I am reading it, so I just wanted to put it out there for discussion.

Erin Gill:

Might I suggest an edit that would maybe get at Jonathan’s point. You have your original statement, “The Council agrees that the four barriers TVA has identified must be overcome in order to facilitate widespread adoption of EVs in the Valley.” Might you say: “TVA has an important role to play in working to address those barriers.”

Jonathan Levenshus:

Yes, that gets to the heart of it. “TVA must play a part in addressing those barriers.” Or, TVA and other stakeholders must play a part in addressing those barriers.”

Erin Gill:

Maybe it could say: “TVA and partner stakeholders must play a role in helping address those barriers.”

David Salyers:

Instead of “must” play a role, maybe “shall” or “should” would be a little more acceptable. Other Council members suggested “should,” rather than “shall.”

Council members discussed the sentence further, resulting in the final sentence revised to read as follows: “The Council agrees that TVA should work with its stakeholder partners to overcome the four barriers identified by TVA in order to achieve widespread adoption of EVs in the Valley.”

Jo Anne Lavender:

Does anyone object to that sentence as it reads?

No one objected.

Jo Anne Lavender:

Are there any other conceptual changes that you want to make in the statement?

Erin Gill:

In the second paragraph, can we say, “Overall, we support TVA’s proposed strategy.” Then, new sentence, “TVA should continue ... “

Jonathan Levenshus:

I have just a quick question: What do we mean by social justice? When we talk about social justice, are we talking about equity? Is that what was meant?

Jennifer Mundt:

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That is my understanding, Jonathan. We were trying to capture the concerns that a lot of us raised about making sure the rollout, the adoption of EVs, the infrastructure and everything that comes with it is done in a just manner, an equitable manner. I don't know how you want to frame that, but we were trying to capture those conversations.

Bill Carswell:

We have not defined social justice, and I don't think we want to go down that rabbit hole.

Jo Anne Lavender:

I think what the group was trying to do was reflect the actual conversation that we had during discussion time.

Jennifer Mundt:

I would agree with Jo Anne. I was taking pretty prescriptive notes of what everyone was saying, and several of you specifically referenced "social justice." We were trying to be respectful of your use of that term. If you all feel that a different phrase would better capture the theme we are trying to address here, we would all be open to some suggestions. Perhaps equitable access is the right term? I will open that up for other suggestions.

Bill Carswell:

That is good, Jennifer. If we want to use the phrase "social justice," I will not object in any way, but we need to be careful when we put things into a document like this that people are going to come back and say, "What did you mean?" Equitable access is really good.

Erin Gill:

I am in favor of using the term "equitable access," however, that then leads me to want to broaden some of our terminology around cost impacts and benefits to include other considerations such as pollution and the other considerations around environmental justice that otherwise would have been addressed in the broader "social justice" term. If we are going to go with equitable access, which I think is a more precise terminology, then I would ask that we consider something related to costs from our last statement in that phrase "overall impacts." We could say "costs and benefits" to ratepayers with the implication that cost becomes a much more inclusive term than simply financial.

Jennifer Mundt:

Is everyone ok with Erin's suggestion to supplant social justice with equitable access and remove the word impacts from the last clause?

Lloyd Webb:

I think this is getting too specific. What I am thinking is "consideration should be given to efforts in other parts of the country" and "the impact on ratepayers" and get rid of all that stuff.

Erin Gill:

I will make a hard pitch that we need to keep equitable access. I don't think it is appropriate to drop it. If we are talking about EV adoption, we need to include availability for those who are not just upper income.

Lloyd Webb:

The problem with equitable access is that depending on the reader, it is interpreted in a million different ways. At least social justice has a common understanding.

Erin Gill:

I don't necessarily agree with that statement, but I appreciate that perspective.

Lloyd Webb:

That was my interpretation; I am not sure what it means. But with social justice, I have a pretty good idea of what that means. If we are going to do away with something, let's do away with it all and just talk about the consideration of the impact on ratepayers.

Jonathan Levenshus:

I think equitable access captures it. We want to make sure the EV work we are doing — charging stations, EVs themselves — that they are deployed equitably. I think that is what we are after. At least what I am suggesting is that we want to target areas that have poor air quality,

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that are in low-income neighborhoods, rural areas. That is what I am trying to get at, and that is going to enhance the adoption of EVs if we try and deploy this strategy equitably.

Lloyd Webb:

That is not what people think of with equitable access. It depends on the context in which you are using it. If you are using the term within the context of an industry that is being served by TVA, the context is totally different than if you are using the term in reference to impacts to low income populations.

Erin Gill:

What I am trying to express is that as TVA considers how it engages in this space; that the intentionality given to it is not an exclusive focus on any one sector, such that the residential, commercial and industrial sectors are included as TVA considers its approaches; that rural communities are included, not just urban communities; that wealthy neighborhoods are considered alongside lower-income neighborhoods. So, to your point around the industrial customers, an equitable approach, an equitable access, would be considering how each of these sectors engage and can participate in the programming that TVA is developing across the spectrum of this EV-supported promotional infrastructure and other programming.

Lloyd Webb:

And, I think you capture all of that if after “country,” put “and the potential impact on all ratepayers.”

Erin Gill said:

I follow your logic. I think the nuance and precision that I would like us to explore and see if there is alignment on is that when we think about impacts to ratepayers, what I have heard from others on the call is that we want to be cognizant not just on how ratepayers participate in programs but how the costs and benefits of such programming are distributed and paid for. To me, that last clause in this statement is around the latter, around how is it that TVA can justify exerting any of the funds that it collects from us as ratepayers into this endeavor, whereas the second clause around equitable access is about ensuring that the investments and the programming that TVA develops have pathways for participation across sectors and income groups and communities.

Lloyd Webb:

I have worked with TVA long enough to know that in their business considerations, they consider all these things. But what we put here is an exclusionary statement. I think we should remove it and just make it holistic.

Bill Carswell:

I would like to take it a step higher. Maybe the way to resolve this is that consideration should be given to efforts in other parts of the country. We need to consider what other parts of country are doing in terms of our research, but our consideration is to our TVA customers, the LPCs and their customers. Maybe we can just delete the sentence?

Jennifer Mundt:

If I could put context around that last sentence. This was our attempt to capture the main themes and points that we collectively had shared in our individual feedback where we thought there were gaps and other things that we wanted TVA to be considering as it moves forward with this programming. We heard a lot about not reinventing wheel, using best practices and avoiding the bad lessons learned so that TVA and the regional partners could advance with a clear glide path. We heard from several, myself included, that we wanted consideration of social justice, whatever we call that term going forward, so that communities and individuals are not left behind as this advances. And we also talked about costs and benefits to all ratepayers. Those were the concerns, the gaps, that we had seen in the work that was presented to us from TVA. So what we were trying to do would illustrate that these are areas that we do not want ignored going forward and that they need to be addressed in order for this to be done in a manner that this Council would support moving forward. I do think we need to have a reference and a point to that equitable access component. I think it is integral. I think it is a consideration

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and concern that not only TVA and its regional partners here are going to have to grapple with, but all across the country, these concerns about equity access and where the infrastructure goes and where resources are allocated is a huge issue and it has to be addressed head-on.

Erin Gill:

I agree, Jennifer. I would support leaving this statement in, pending additional modifications we desire to make. But I do appreciate that you have attempted to capture the actual discussion and the meat of our input based on TVA's presentation today. Hopefully, this is the helpful nuance that TVA expects to hear from the experts who are a part of this panel.

Lloyd Webb:

I will leave it up to a vote, but frankly, I think I was the first one to raise the social justice issue, and I sure was not talking about equitable access.

Doug Peters:

What if you say ... "Considerations should be given to lessons learned from EV program development in other parts of the country and assurance that costs and benefits are equitably applied across all customer classifications." Or "all ratepayer classifications." Or "all ratepayers."

Bill Carswell:

I like what just got typed in. I can live with "... lessons learned from EV program development in other parts of the country, social justice, equitable access, costs and benefits to ratepayers." If we can't agree on what social justice means, which we don't, that is fine. We all intend well. So, I can accept this document as it is written right now.

TVA's Joe Hoagland:

I think there are actually a couple different issues, so I am ok with having both words in here. The Board is already aware of these kinds of issues, and it doesn't just apply to electric vehicles. It is something we are taking into consideration, so I think they would appreciate this point of view.

Lloyd Webb:

If it is OK with Joe, I am fine with it. At the end of the day, he is the one who will have to explain it to people.

Khurshid Mehta confirmed that there were 10 members, which constitutes a quorum.

Bill Carswell made a motion, and Erin Gill seconded the motion, that the Advice Statement be accepted as written. There was a roll call, and the Advice Statement was accepted with unanimous agreement.

APPROVED ADVICE STATEMENT

We appreciate the hard work of the state of Tennessee, TVA and the many other entities that came together to create the Drive Electric TN Roadmap. Widespread electric vehicle adoption has the potential to help the region with cleaner air and meeting carbon reduction goals, and manufacturing of EVs and supply chain already benefits the region's economy.

Overall, we support TVA's proposed strategy. TVA should continue its focus on thought leadership, convening stakeholders and supporting adoption of EVs in the Valley. As TVA partners with others to make the Roadmap a reality, together they must ensure that these efforts cross state lines.

The Council agrees that TVA should work with its stakeholder partners to overcome the four barriers identified by TVA in order to achieve widespread adoption of EVs in the Valley. Consideration should be given to lessons learned from EV program development in other parts of the country, social justice, equitable access, costs and benefits to ratepayers.

WRAP-UP

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Jo Anne Lavender:

Our next meeting is tentatively set for the March/April 2021 timeframe. We also will have a special meeting about the Sustainability Report in December.

Joe Hoagland:

We are going to have a meeting on December 1, so please put that on your calendar. It is going to be a combination of RERC and RRSC (Regional Resource Stewardship Council) together. It is to look at the 2019 Sustainability Report. We are getting ready to do the next one, and we would like your input about how this one was, where you see gaps, what things we can do to improve it going forward. This is very important for TVA. It is also new. We are figuring out how to do a Sustainability Report that aligns with what our stakeholders in the Valley want to see, not just simply a sustainability report that you might get off a Wall Street page. We definitely would appreciate folks' involvement, and we will send out more details shortly.

Bill Carswell:

I am looking forward to the discussion on sustainability. One thing I really want to see is how you define sustainability. That is the biggest sticking point in having a conversation about sustainability.

Jo Anne Lavender:

Thanks to the public for listening. You can find out more information on our website: tva.gov/rerc. Also, we have public comment periods on various initiatives that TVA has, and you can look at that website, too, which is tva.gov/about-tva/get-involved-stay-involved. We do appreciate your attendance, and we appreciate the attendance of the Council.

Jennifer Mundt:

I would just echo the appreciation that you shared, Jo Anne. I share that as well. Thanks, everybody, for your time and participation and your commitment to the work of this Council as we help TVA and these efforts.

Bill Carswell:

I want to say that I so appreciate the opportunity to provide input to a socially, economically, environmentally relevant environment like this. It means a lot to me.

Joe Hoagland:

Thank you, everybody. The meeting is adjourned.

Minutes Approved:



1/19/2021

Jennifer Mundt, Council Chair

Date

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Appendix A Non-Council Meeting Attendees

TVA Staff Members	
Pam Anderson	Cass Larson
Noah Ankar	Jo Anne Lavender
Jennifer Brundige	Khurshid Mehta
Cathy Coffey	Deborah Murray
Kevin Duncan	Barbie Perdue
Andrew Frye	Travis Reid
Chris Hansen	Marylee Sauder (contractor)
Amy Henry	Andrew Scaf
Cindy Herron	Rick Underwood (TVA Office of Inspector General)
Joe Hoagland	Liz Upchurch
Althea Jones	
Donald Knotts	
Heather Kulisek	

Stakeholders	
Al Berrong	Erik Schmidt
Molly Cripps	Maggie Shober
Richard Holland	Brandon Wagoner
George Nolan	Becky Williamson
Joe Ozegovich	

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9:30	Welcome and TVA Update RERC Chair Jennifer Mundt and Designated Federal Officer Joe Hoagland (DFO) Roll Call, Safety Moment, Meeting Protocols , Jo Anne Lavender, Facilitator
10:30	Break (10 min)
10:40	TVA's EV Strategy - Drew Frye, Travis Reid RERC Q&A
11:50	RERC Discussion of Advice Questions
12:00	Lunch Break (55 minutes)
12:55	Reconvene
1:00	Public Listening Session
1:30	RERC Perspectives
2:30	Break (20 min.)
2:50	Review preliminary Advice statement; refine; roll call vote - Jennifer, JoAnne
3:15	Respond to Qs, next meeting date/topics Wrap up
3:30	Adjourn