

Regional Energy Resource Council

October 14, 2020 Virtual Meeting

Welcome

RERC Chair, Jennifer Mundt

- TVA Designated Federal Officer, Joe Hoagland
 - Senior Manager Althea Jones
- RERC Meeting Facilitator, Jo Anne Lavender



RERC Virtual Meeting

- This is the third meeting of the 4th term of the RERC
- This meeting is being recorded. A link will be provided on the TVA RERC Website (tva.gov/rerc).
- We welcome members of the public attending and who are in listen only mode. For those that pre-registered to make public comments, the meeting host will unmute your line at that time. Written comments are always welcomed (tva.gov/rerc)
- RERC Members are able to mute and unmute their own line. Please keep yourself on mute until you wish to speak. RERC Members may use the raise hand function to be recognized for questions or comments. Please turn off your video when presentations are being made.



Safety Moment - Daylight Savings Time Ending

It takes 5-7 days to adjust for the 1-hour time change causing people to experience grogginess. Research shows that the disruption to the internal clock can cause increased car accidents, heart attacks, stroke, weight gain, anxiety and workplace injuries.

Suggestions:

- Stay alert around schools, playgrounds and parks during evening commute
- Watch for the low setting sun when driving west in the afternoon
- Exhaustion and fatigue are more common in teenagers and they need more rest
- Avoid the seasonal blues by getting 15 min. of early morning sunlight before
 10 a.m. daily and exercise everyday that first week



Virtual RERC Meeting Agenda – October 14, 2020

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Welcome, Safety Moment, Introductions, TVA Update
9:30
10:35 Break
10:45 TVA Electric Vehicle Strategy
11:30 Discussion
12:05 Lunch Break – 55 minutes
1:00
      Public Comments
1:30
      RERC Perspectives
2:30
      Break
      Review and Vote on Advice Statement
2:50
3:15
      Next Meeting Date
3:30
      Adjourn
```



Term 4 RERC Members – Introductions

- Name
- Position, Organization
- What has been a positive in 2020 for you because of or in spite of the pandemic?

Michael Butler

Tennessee Wildlife Federation

Dr. Bill Carswell

University of Alabama, Huntsville (ret'd)

Erin Gill

City of Knoxville

Rodney Goodman

Habitat for Humanity

Dana Jeanes

Memphis Light, Gas, and Water

Matt Largen

Williamson, Inc.

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Sierra Club

Peter J. Mattheis

Tennessee Valley Industrial Committee

Jennifer Mundt, RERC Chair

State of North Carolina

Alice Perry

State of Mississippi

Doug Peters

Tennessee Valley Public Power Association

Dr. Kari Babski-Reeves

Mississippi State University

Patrice Robinson

Memphis City Council

David Salyers

State of Tennessee

Charles Snavely

Commonwealth of Kentucky

Clay Walker

NETWORKS Sullivan Partnership

John Warren

Commonwealth of Virginia

Lloyd Webb

Olin Chlor Alkali



Recap of RERC Term 4 Meeting 3 – June 23, 2020

Subjects covered included:

- Internal and external impacts of COVID 19 and TVA responses;
- TVA Valley Partner update;
- Energy System and COVID 19 impacts;
- A community member shared his views on TVA coal ash storage and the need to increase renewables in the portfolio;
- You shared the impacts of the virus on your organizations and identified challenges TVA may face in a post COVID world.

Today's Meeting Purpose

- Provide an update on TVA COVID-19 responses, Board decisions
- Host a Virtual Public Listening Session
- Hear RERC views on TVA's Electric Vehicle (EV) Strategy
- Create an Advice Statement regarding TVA's EV Strategy

Advice Questions

- 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?



DFO Update

Joe Hoagland, Designated Federal Officer

TVA Update

- TVA COVID 19 Response
 - https://www.tva.com/coronavirus
 - TVA Operations / Employees
- TVA Board Meeting August, 2020
 - Extension of COVID 19 financial support
- TVA Valley Partners
- Southeast Energy Exchange Market (SEEM)
- Vonore Battery Project



Pandemic Support

- Community Care Fund: 355 approved applications from 136 LPCs, with \$2.7M in TVA funding contributing to a total of \$5.3M in nonprofit proceeds
- Back-to-Business Credit: 77/108 LPCs and 224/644 large customers are participating; credits issued to date totaling \$9.9M and supporting approximately 91,000 jobs across the Valley
- Economic Development: 51 customers benefitting from relaxed criteria, deferred claw-backs, and avoided credit suspensions, totaling approximately \$5.8M



Valley Partner & LPC Engagement

- Aberdeen Electric Department: Conducted "follow-up listening" meeting with Mayor; working toward city council meeting participation and potential legal escalation
- Bessemer, Glasgow Rate Request under consideration
- Flexibility Agreement: 62 signees as of October 9
- NES Resumes Disconnections, Late Fees for Late Payments: WTVF-TV
- GEPB/TVA Award Additional Money to Community Relief Fund: WCLU-AM



Southeast Energy Exchange Market (SEEM)

TVA continues to look for ways to efficiently integrate renewable energy into our portfolio, while providing low cost, reliable energy.



Vonore Battery Storage System



Break – 10 minutes

Be Ready for...



Mobile

Poll Everywhere on mobile





- Download it on your mobile device
- 2. Enter EXTREL

Web



- 1 Go to PollEv.com
- 2 Enter EXTREL
- 3 Respond to activity





Electric Vehicle OPPORTUNITY

Drew Frye – TVA Transformative Innovation

Travis Reid – TVA Commercial Energy Solutions

Topics We'll Cover

- Impact of Electrifying Transportation
- Background on EVs & the Market
- Consumer Research Insights
- The EV Roadmap & Barriers to EV Adoption
- How TVA and Stakeholders can Remove Market Barriers
- Discussion and Advice

TVA's Mission



ENERGY | ENVIRONMENT | ECONOMIC DEVELOPMENT | INNOVATION

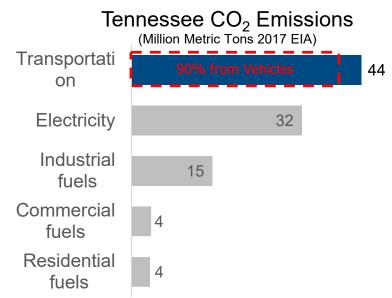
Why TVA Focuses on Electric Transportation

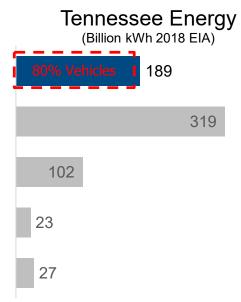
Electric Vehicles: Transportation electrification presents a substantial opportunity

- Reduce the largest source of CO₂ and other air pollutants
- Use energy more efficiently better use of energy resources
- Balance the power system off-peak charging helping keep rates low
- \$ Invest locally economic benefits of more locally produced fuel
- Attract economic development prospects EV production and suppliers
- Lead innovation leaders, driving sustainability

Why TVA Focuses on Electric Transportation

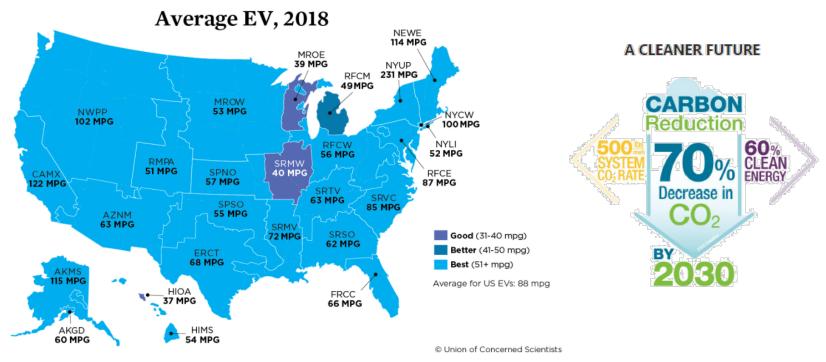
Transportation is the largest source of carbon emissions and 2nd largest energy user





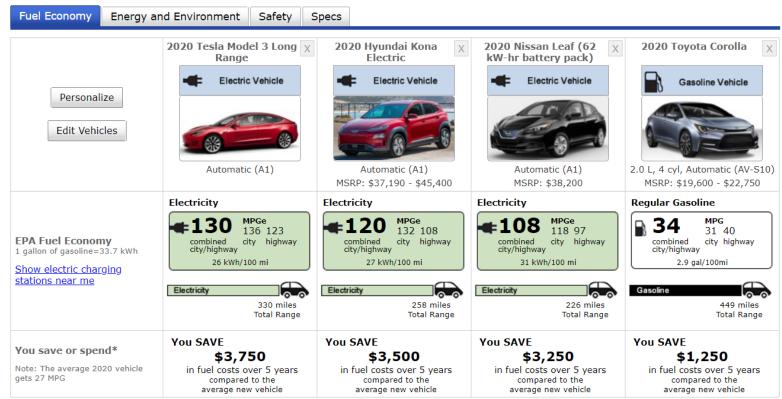
Emissions – Getting Better Every Year

EV Emissions as Gasoline MPG Equivalent



Energy – EVs are 60% vs. 20% Efficient

Compare Side-by-Side



Economic – Jobs and Local Investment

TN ranks No. 1 for employment concentration of auto and component manufacturing; Southeast is a growing hot spot of activity



- Denso, TN
- Van Hool, TN
- Toyota / Mazda, AL
- GM / Cadillac, TN
- SK Battery, GA
- Daimler / Mercedes, AL
- New Flyer, AL
- More to Come!

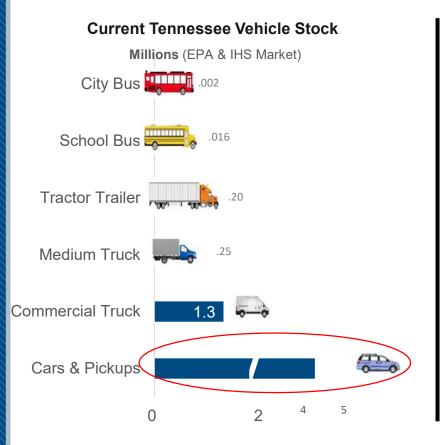




Smyrna Nissan Nissan Leaf & Ariya



Electric Vehicle Market Opportunity



Just 4% or 200,000 EVs on the road for 5 years, we would see:



8,600 lbs of $CO_2e/car/year =$

4MMT CO₂e reduced



Instead of \$2/gal for gas \$600M

stays local or in consumer's pockets



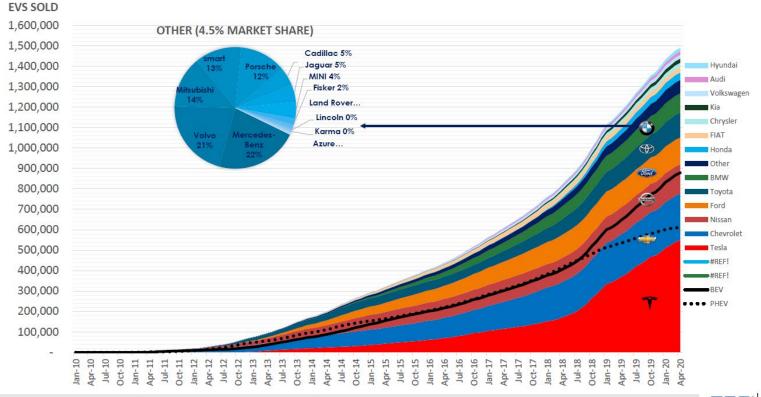
Electric Vehicles – 10 Year Retrospective

EV Topic	January 2010	January 2020
Number of EV Models for Sale	1	42
Number of EVs Announced Next 3 Yrs.	17 Small Cars	120 Cars, Trucks, SUVs
Charging Stations vs. Gas Stations in U.S.	2,000 vs. 120,000	27,000 vs. 110,000
Typcial EV Range	74 mi (2010 Nissan LEAF)	226 mi (2020 Nissan LEAF)
Maximum EV Range	244 mi (Tesla Roadster)	402 mi (Tesla S)
Acceleration 0-60 mph	2.5 sec (Bugatti Veyron - \$1.25M)	< 2.3 sec (Tesla S - \$100k)
Battery Cost	\$1,000 \$/kWh	< \$200 \$/kWh

Better: Choice, Cost, Range, Performance, Avaliability



U.S. EV Sales Exceed 1.5M through April 2020



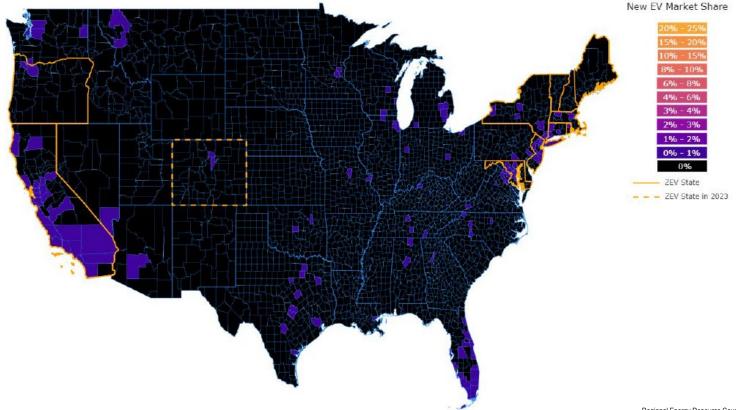
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www.epri.com

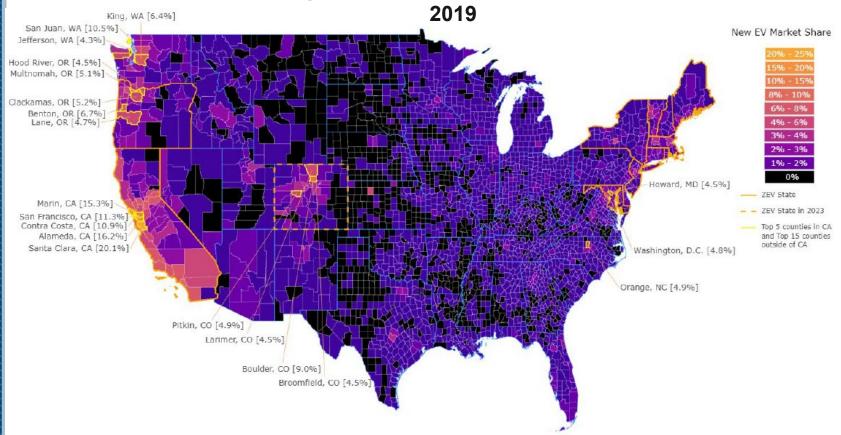


EVs Spreading Across the U.S.

2010

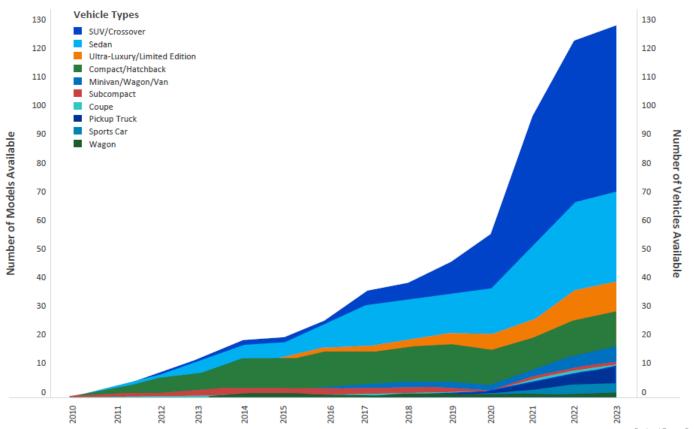


EVs Spreading Across the U.S.





Growing Vehicle Choice in All Segments



Electric Crossover, SUV and Truck Options













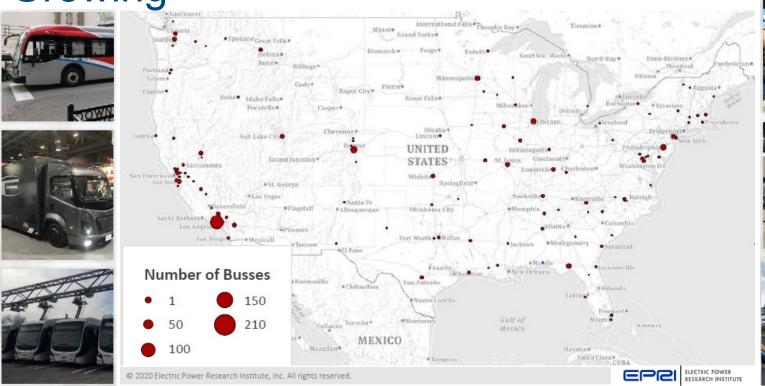
2020 Toyota

Photos: Cedric Daniels, Alabama Power, a division of Southern Company (January 2020); Dan Bowermaster EPRI (November 2019)



Electrification for BIG Vehicles also

Growing



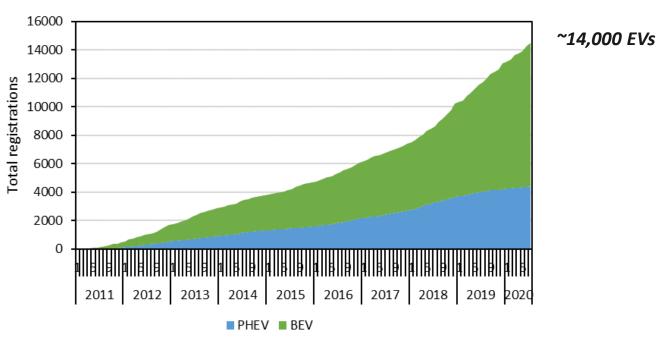




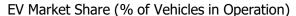


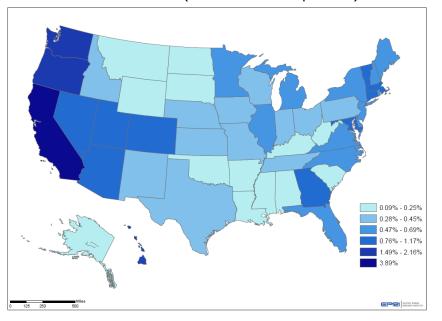
TVA's EV Market is Playing Catch Up

TVA Territory Cumulative EV Registrations



The Valley Lags Other Areas in EV Adoption







What are the barriers to greater EV adoption in the Valley?



It's Time for...



Mobile

Poll Everywhere on mobile



- Download it on your mobile device
- 2. Enter EXTREL

Web



- 1 Go to PollEv.com
- 2 Enter EXTREL
- 3 Respond to activity



Have you driven an EV?

Yes! I own an EV!

Yes! I tried it and liked

Yes... it's not for me. **C**

No... but I want to. **D**

No... not interested **E**

Other... will explain during open discussion **F**

What keeps you from buying an EV now?



Goal: Position TVA & LPCs as Innovative Leaders in Electrifying Transportation

TVA has an opportunity to lead the EV strategy in the Valley, but it won't happen overnight. Based on what we've learned from successful regions around the country as well as local consumers, dealerships, and businesses, the EV Consumer Research Team recommends three immediate strategic priorities.

Here's how we plan to get started in 2020.

GIVE PEOPLE A REASON TO CARE



Without regulatory or social influence, most people in the Valley don't feel compelled to learn about EVs; therefore, there is a general lack of awareness, interest, and knowledge. Users need a personal reason to care before they'd consider buying an EV. Here's how we plan to get started:

- 1. Create an EV Buzz at TVA and LPCs
- 2. Consumer Marketing & Digital Engagement
- 3. Experiential Educational Events

MAKE IT EASY TO BUY & OWN



Switching to an EV is a lifestyle change. Potential buyers fear the unknown and crave a sense of security. There are several barriers including dealership participation, inventory access, and charging infrastructure. Users will require a simpler path. Here is how we plan to get started:

- 1. Public Charging Infrastructure
- 2. Personalized Tools for Buyers and Sellers
- 3. Business & Industry Engagement

AMPLIFY THE EV COMMUNITY



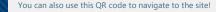
EV owners are extremely proud and confident in their purchase. Group norms have started to form organically that help spread EV knowledge, such as letting strangers drive their cars.

Potential buyers value these opinions and experiences. There is an opportunity to enhance the natural peer-to-peer selling process. Here is how we plan to get started:

- 1. EV Ambassador Program
- 2. Consumer Forums & Feedback

Want to learn more?

Head over to www.tvaevstudy.com and use the password: stoked+tva





Because We Uncovered These Insights

Each of the concepts listed above was inspired by user insights. Here are some samples of what we heard from consumers, dealerships, and businesses.

Each icon below represents a key theme from real users.



While dealerships and businesses with fleets will play an increasingly important role in the EV movement, currently consumers represent the largest opportunity for impact.





EVs feel like a list of problems to solve.

Consumer #2



The environmental pitch seems questionable.

Consumer #3



EVs were built for the upper class.

Consumer #4



Most potential Valley buyers are radically uninformed.

Consumer #5



Current EV owners are extremely passionate about their cars and eager to share.

Dealer #1



Most dealerships aren't compelled to sell EVs.

Dealer#2



The role of the car salesperson needs to shift.

Dealer#3



There is a serious lack of EV inventory in the Valley.

Business #1



Public entities with fleets fear EV technology and forcing others to change.

Business #2



crave a tech forward competitive advantage, but don't yet clearly see how to make EVs happen.

Human-Centered Engagements









A quick snapshot of the team's methodology.

Creating Partnerships & Mobilizing EV Stakeholders

The following Key Contributors and participating organizations attended events, developed and reviewed key deliverables over nine months to create a <u>Roadmap for EVs</u>.



































Participants:

- Atlas Public Policy
- Bridgestone
- BYD
- CDE Lightband
- · City of Nashville

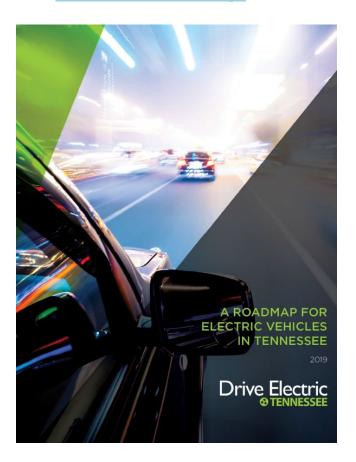
- City of Knoxville
- City of Chattanooga
- Cummins Filtration
- Draft Agency
- General Motors

- Greenlots
- GRIDSMART
- Local Motors
- Schneider Electric

- SoftServe
- Southeast Energy Efficiency Alliance
- Stantec
- Tennessee Automotive Association



The EV Roadmap – Identified Market Barriers



Identified 4 Major Market Gaps

Charging Infrastructure Availability (range anxiety)

Innovative & Supportive Policies

EV Availability & Offerings

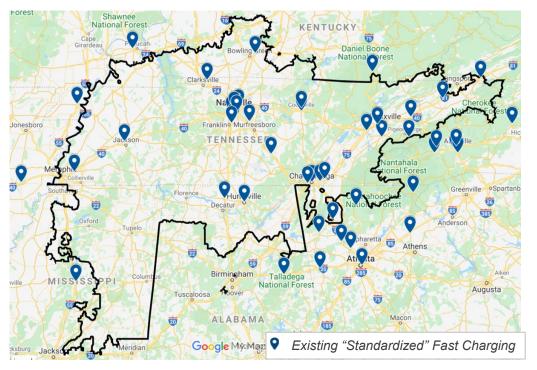
Consumer Awareness



Charging Infrastructure Market Barrier

"Range anxiety" is consistently a top consumer barrier; current fast charging infrastructure is poor (unstandardized, inconsistent, existing=25, 50% in urban areas)

areas)



What Others are Doing

Charging Infrastructure: States, Utilities and Industry are coordinating and collaborating together to build regional systems to facilitate travel; Utilities and Industry supporting home and around town charging options

Midwest utilities team up for EV charging network

















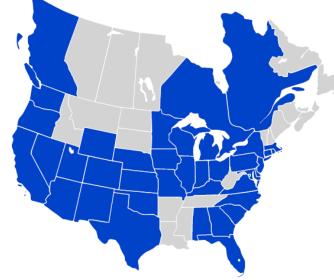
For media requests please contact Cassie Powers at cpowers@naseo.org

Eight Intermountain West Governors Commit to Coordinating on Regional Electric Vehicle Charging Infrastructure, and Release Voluntary Minimum Standards for Stations



East Coast states to coordinate deployment of EV charging hubs

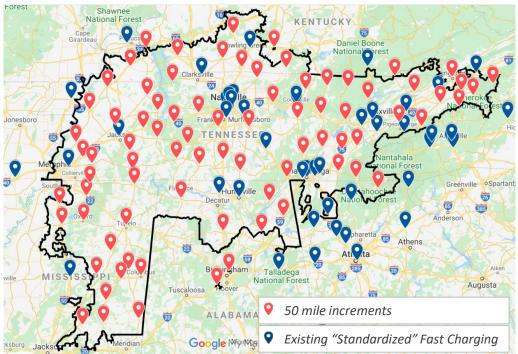
Utility Infrastructure Programs



What TVA and Stakeholders can do - Lead

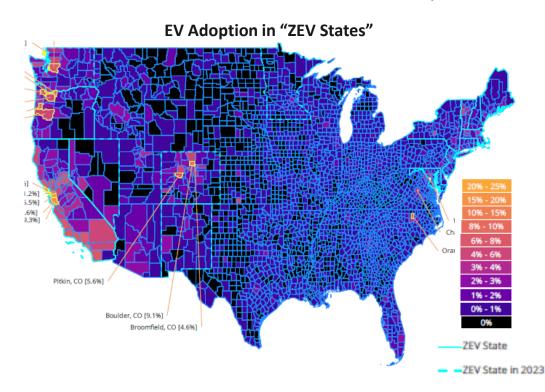
Partner to create the foundational charging network that enables driving an Electric Vehicle EVerywhere in the Tennessee Valley

Illustrative Example



Policy Market Barrier

Top EV markets are boosted by strong policies (state, local, regulatory, utility), but Southeast states are less inclined to push EVs





What Others are Doing

Supportive Policy: States, Regulators, Local Governments and Utility supportive policies and programs (incentives, mandates, ordinances, utility investment approval, rate designs)

California Plans to Ban Sales of New Gas-Powered Cars in 15 Years **News Release**

City of Atlanta Passes "EV Ready" Ordinance into Law

Governor Cuomo Announces Nation-Leading Initiatives to Expand Electric Vehicle Use to Combat Climate Change



Colorado bill extending electric-vehicle tax credits charging through Capitol

PUC Adopts Final Policy Statement on Third-Party Electric Vehicle Charging; Reduces Regulatory Uncertainty, Promotes New Investment



What TVA and Stakeholders can do – Set & Support

Set supportive utility EV policies (rates, regulatory, legal) and leverage stakeholders to create and share positive EV policy guidance at state and local levels

- Contractual changes to enable simple and fair consumer pricing models across the Valley
- Rates for fast charging that encourages 3rd-party investment in public charging infrastructure
- Regulatory stances that encourage LPC investment and engagement in public charging infrastructure
- Stakeholder led impactful policies at State and Local levels

EV Availability & Offerings Market Barrier

Markets with vehicle choice, competition and inventory thrive, while limited markets struggle with lack of affordable EVs for various uses



(2020 Toyota RAV4 has Plug-in Hybrid Option)

What Others are Doing

EV Availability & Offerings: State mandates (ZEV) are by far the most impactful way to increase vehicle availability and offerings, but also offering incentives and partnering with Automakers, Dealers, Fleets, Rideshare companies, etc. are ways to bring more EV to your market.

Lyft deploys 200 long-range EVs for its rideshare rental fleet in Colorado

Frito-Lay hits milestone with allelectric vehicles, plans to purchase 100 more

Utilities and the Auto Industry: A Romance That's Meant to Be

March 5, 2020 | By Oliver Pincon, ZappyRide and Erika Myers, SEPA

10 Ways That Car Dealerships **Can Step Up To Sell Electric Vehicles**

General Motors and Uber team up to help reduce vehicle tailpipe emissions and accelerate the transition to an all-electric future

What TVA and Stakeholders can do - Convene

Engage local EV automakers in partnerships to bring more EVs to the Valley;

Collaborate with commercial fleets and public transit agencies to investigate "large scale" electrification opportunities

 Already engaged automakers, rideshare operators, trucking, school systems and public transit to identify unique market barriers, gauge interest in partnerships and inform our planning













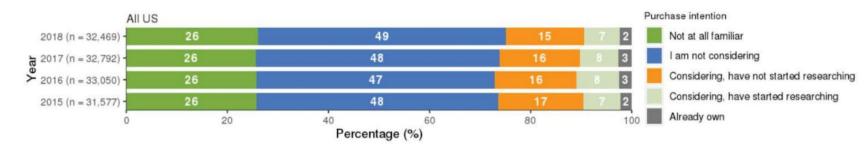


Consumer Awareness Market Barrier

Awareness of EVs (benefits, viability for everyday use) is low and has shown little change; vehicle purchase is a major, multi-year consumer decision and automakers and dealerships are currently unprepared to support rapid EV demand

Considering purchasing an EV

National residential data



What Others are Doing

Consumer Awareness: Driving awareness and education through online tools, social media, multi-media campaigns, sponsored ride n' drives.











What TVA and Stakeholders can do – *Drive*

Enable and boost consumer-focused efforts to educate, inform and promote EVs to transform the market

Strategic priorities identified through extensive ethnographic consumer research

GIVE PEOPLE A REASON TO CARE



MAKE IT EASY TO BUY & OWN



AMPLIFY THE EV
COMMUNITY



What are we Missing?

Market Gap	*Role and Actions
Charging Infrastructure Availability	Lead Partner to create the foundational charging network that enables driving an Electric Vehicle EVerywhere in the Tennessee Valley
Innovative & Supportive Policies	Set Internal & Support External Set Supportive Utility EV Policies (Rates, Regulatory, Legal); Leverage EV stakeholders to create and share positive EV policy guidance at state and local levels
EV Availability & Offerings	Convene Engage in-Valley automakers in partnerships to bring more EVs to the Valley; Collaborate with commercial fleets and public transit agencies to investigate "large scale" electrification opportunities
Consumer Awareness	Drive Enable and boost consumer-focused efforts to educate, inform and promote EVs to transform the market

^{*}Each market gap is important and interdependent for widescale EV adoption, but TVA's role and activities in each area will differ





Thank you!

Drew Frye
Project Manager Electric Vehicle Evolution
agfrye@tva.gov
423-751-7060



RERC Questions and Discussion

RERC Discussion

- 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?

Lunch Break

Meeting will reconvene at 12:58 PM EDT

Please stay connected just turn off video and mute your computer





Public Listening Session

- Public participation is appreciated
- This is a listening session; responses are typically not provided



Preregistered Public Speakers

2 minutes per speaker

No registered speakers



RERC Discussion

Term 4 RERC Members – Advice Comments

RERC Members will be called on in alphabetical order to provide up to 2 minutes of comments:

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?

Michael Butler

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University of Alabama, Huntsville (ret'd)

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City of Knoxville

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State of Tennessee

Charles Snavely

Commonwealth of Kentucky

Clay Walker

NETWORKS Sullivan Partnership

John Warren

Commonwealth of Virginia

Lloyd Webb

Olin Chlor Alkali



Break – 20 minutes

Advisory Statement Review



Term 4 RERC Members – Roll Call Vote

Michael Butler

Tennessee Wildlife Federation

Dr. Bill Carswell

University of Alabama, Huntsville (ret'd)

Erin Gill

City of Knoxville

Rodney Goodman

Habitat for Humanity

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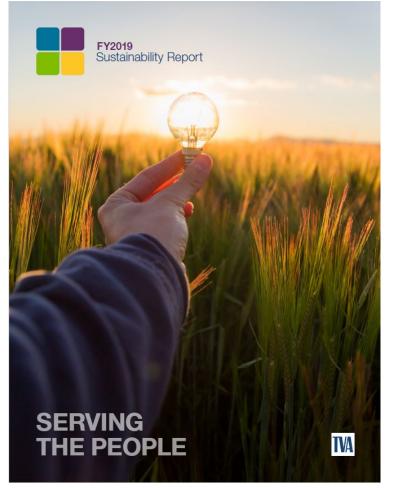
Olin Chlor Alkali



^{*}RERC Chair



Wrap Up



tva.com/sustainabilityreport

Sustainability Reporting

Attracting Industry: Low rates and carbon competitiveness are critical selling points to companies looking to build or relocate in the region.

Disclosure: Transparency and availability of information.

Reputation: Outlines TVA's commitment to sustainabilty and sets the stage for Valley sustainabilty focus and dialogue with stakeholders.

Assisting LPCs: TVA provides information on ${\rm CO_2}$ and carbon accounting and the generation mix for you to share with your customers.



Next Steps:

- Next RERC Meeting: Tentative March/April 2021
- Please review the Sustainability Report and respond to the survey you will receive if you are unable to attend the Dec. 1 meeting.

For public input:

- To provide comments or find more RERC information, visit: www.tva.gov/rerc
- Stay up to date on TVA public comment periods and meetings at https://www.tva.com/about-tva/get-involved-stay-involved



