

EV Convening Memo STRATEGIES FOR EFFECTIVE EV–GRID INTEGRATION

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Acknowledgements

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Introduction

The American Council for an Energy-Efficient Economy (ACEEE) organized a one-day national convening on utilities and electric vehicles (EVs) on November 14th, 2018, in Atlanta. The primary focus was helping utilities develop EV policies and practices that support their business models and offer system benefits at the same time as they ensure EVs' consumer, economic, environmental, and other societal benefits. The event was national in scope, but we chose the Atlanta location to highlight current developments in the Southeast.

The theme of the convening originated from an ACEEE report released at the beginning of 2018, *Strategies for Integrating EVs into the Grid*. This report discussed strategies for EV–grid integration including rate design, smart charging, charging station investment and ownership, vehicle purchase incentives, and coordination with state and local efforts.¹ The Atlanta convening promoted a direct exchange of information among utilities and other national and regional EV stakeholders including vehicle manufacturers, EV advocates, state and local policymakers, and regulators. More than 70 participants representing diverse organizations and regions attended the event. The convening identified opportunities for these stakeholders to work together to advance the intelligent adoption of EVs.

The convening agenda and a list of attendees and their affiliates are available in the Appendix.

Overview of Convening Sessions

The convening consisted of an opening foundation-setting session and technical sessions on four key EV topics: intelligent EV adoption and grid integration, rate design, charging systems, and customer engagement.

In the opening session, ACEEE executive director Steve Nadel presented the context for beneficial electrification from both national and regional perspectives. He shared ACEEE's perspective on when beneficial electrification can also serve as a form of energy efficiency: when it reduces overall energy use, fully or partially displaces direct fossil fuel use, saves money for consumers, and reduces emissions.² Commissioner Tim Echols stressed the need to highlight EV benefits beyond air quality and green attributes in order to encourage their acceptance by the larger community. He also observed that EVs and solar could benefit from cross marketing.³ The opening session also included some survey questions that gave participants a real-time opportunity to provide input and framing for the group. For example, participants identified a wide range of challenges to EV development, including customer education, range anxiety, access to charging infrastructure, and cost. To overcome these challenges and enable EV adoption, participants identified car manufacturers, dealers, utilities, and state and local governments as the most critical stakeholders. In particular, participants saw a number of areas where utilities can play an important role in EV development, including managing charging through rates, customer education, and EV adoption programs such as rebates, dealer partnerships, and marketing. Additional details of the survey questions and the participants' responses are provided in the Appendix.

Intelligent EV Adoption and Integration

This session discussed opportunities for and barriers to intelligent EV adoption. Leading EV stakeholders identified policies and practices that support utility business models and system benefits while ensuring

[†] The ACEEE EV report is available at http://aceee.org/research-report/t1801

² <u>https://aceee.org/sites/default/files/pdf/conferences/ev/nadel.pdf</u>

³ https://aceee.org/sites/default/files/pdf/conferences/ev/echols.pdf

economic, environmental, and other societal benefits for customers. Bill Copeland from the Electric Power Board of Chattanooga highlighted the importance of a "succinct" business model for utilities that outlines to EV owners the long-term benefit of this new technology.⁴ He demonstrated a framework to explain how EV owners can receive all perceivable lifecycle benefits if they own their EVs for more than five years. He also stressed the need for utility partnerships with EV manufacturers and dealers, electric vehicle supply equipment (EVSE) placement coordination with states, vehicle incentives, and above all, customer awareness of the attributes of EV technology.

Administrator Mary Beth Tung described the State of Maryland's EV efforts using Volkswagen settlement funds, especially EVs at airports and the EV bus program to support equitable access to EVs. Tung stressed the need to work with NGOs to bring EV benefits to underserved communities. She highlighted the nonenergy benefits of EVs compared to conventional vehicles, including their quiet operation, sharing that police officers love EVs because they can quietly position themselves right behind the perps.

Sophie Shulman from Electrify America, a subsidiary of Volkswagen North America, highlighted the subsidiary's investments in Level 2 charging and DC fast charging across the country.⁵ Electrify America is planning a network of 484 charging stations across the country, spaced no more than 120 miles apart along major interstate routes. "High powered charging provides a consistent and convenient experience for all customers," she said. One interesting note from the discussion was that EV owners had less range anxiety than potential owners. This was because owners found that their EVs provided sufficient range for their day-to-day activities.

Rate Design: Managing Demand and Unlocking Multiple Value Streams from EVs

Three key topics were discussed in this session: rate design, demand charges, and load management. Speakers differed on what works best for EVs with respect to providing electricity. Mike Waters from ChargePoint emphasized the need to understand the EV load and ways to shape it. He cited how time-ofuse rates can help reduce EV load during peak periods relative to traditional volumetric rates.⁶ While both Waters and Chris Nelder from the Rocky Mountain Institute (RMI) considered rate design to be a key issue for EVs, Chuck Caisley from KCP&L had a somewhat different perspective.⁷ He observed that while customers did not pay much attention to rate design, it remains an important tool for system utilization. He suggested using real-time data to influence and manage charging. All speakers agreed that demand charges can be a disincentive for EV adoption and need to be addressed. Nelder and Waters cited some examples of how utilities are either waiving or modifying this charge. Southern California Edison and Pacific Gas and Electric Company recently adopted RMI's recommended principles and rate designs, which include no demand charge when the utilization rate is low, but do include a higher volumetric rate. When utilization increases, demand charges can be increased gradually, but should be compensated with decreases in volumetric rate. National Grid, Eversource, and Exelon (PECO) provide temporary relief of demand charges for commercial customers.

Several participants made some interesting suggestions. One suggested changing the language for discounted cost to "happy hour" and high cost to "rush hour" to make customers aware of peak and non-peak rates. Another participant wondered about charging by time in addition to, or instead of, kWh charges to encourage users to make charging stations available for others.

⁴ <u>https://aceee.org/sites/default/files/pdf/conferences/ev/copeland.pdf</u>

⁵ https://aceee.org/sites/default/files/pdf/conferences/ev/shulman.pdf

⁶ https://aceee.org/sites/default/files/pdf/conferences/ev/waters.pdf

⁷ https://aceee.org/sites/default/files/pdf/conferences/ev/nelder.pdf

Corey Ershow from Lyft talked about the transportation company's EV program during lunch. He highlighted the barriers of EV adoption and how ridesharing could help move many trips to EVs while also exposing many customers to EVs.⁸ He also discussed Lyft's plan to recruit drivers from underserved communities and rent EVs to them in order to familiarize them with this new technology. He said a key to this vision will be a network of fast chargers in metropolitan areas so that drivers can charge without taking too much time out of their day.

EV Charging Systems: Investment, Ownership, and Operation

This session was aimed at presenting different perspectives on utility investment, ownership, and operation of EV charging infrastructure to participants. James Cater from Eversource, Dave Kolata from the Illinois Citizens Utility Board, and Tom Ashley from Greenlots took part in an interactive discussion. Kolata emphasized the need to put less focus on EVSE ownership, while still focusing on the underlying principles that allow all consumers to benefit from EVSEs. Although skeptical about a rate-base structure, Kolata wanted a proactive role for utilities, but he noted their investments should be tied to outcomebased regulation. Ashley also stressed the need to focus less on EVSE ownership questions and instead, concentrate on how utilities could help in managing load. "There is not really a business model for charging stations, therefore, private investors are losing money," he said. However, Ashley was optimistic that the situation would be much better in two to three years. He was opposed to utility ownership of charging stations, but stressed the need for a better charging facility than the traditional gas station. Cater, too, echoed Ashley's perspective that there was no current business model for charging stations. He described Eversource's EV make-ready infrastructure through which the company would deploy \$45 million for EV infrastructure, while letting private companies install and manage the chargers themselves. He also described multi-dwelling owners' inconsistent attitude toward EV charging system placement; some were open to them while others were reluctant and resistant. All three speakers and moderators agreed on the need for EV outreach to underserved communities.

With agreement that societal benefits are a driving factor behind the establishment of a utility role in developing EVs, moderator Joe Halso from the Sierra Club posed a question to the panelists about ways to realign shareholder incentives with the desired outcomes, which may not always drive value for shareholders. Kolata responded to this question in favor of outcome-based approaches for EVs, similar to energy efficiency performance incentive mechanisms. Cater and Ashley agreed that incentives should be aligned with beneficial management or other desired outcomes, but expressed concern that it may be too early in the process to fully implement a performance-based ratemaking process for EVs. Kolata pushed back on this, expressing that it is important to put these policies in place before expectations have been set.

Putting Up Road Signs: Building Customer Engagement

Successful customer engagement is key to intelligent EV adoption. In this session we wanted to learn how parties are engaging customers on EVs and what lessons they have learned. The speakers were Norm Saari, commissioner from the Michigan Public Utilities Commission, Alan Shedd from Oglethorpe Power Corporation, and Cornelius Willingham from Nissan USA.

At several points, speakers and participants indicated the need for coalition building and coordinated public policy in effective customer engagement. Noting that utilities are generally trusted by many customers and stakeholders, speakers urged these utilities to help bring intelligent solutions through customer engagement. Although session participants acknowledged that EV adoption and deployment are

⁸ https://aceee.org/sites/default/files/pdf/conferences/ev/ershow .pdf

challenging, they agreed that customer engagement and education are necessary to overcome adoption barriers. Shedd suggested putting people behind the wheel of an EV. He cited the success of community EV events and giving used EVs to high school students for driving practice.⁹ Commissioner Saari identified time-of-use rates, charging station locations, and EVSE education as critical elements of the utility sector's customer engagement efforts in Michigan. While discussing EV benefits, Willingham claimed that when replacing a gasoline-fueled car, one Nissan Leaf displaced six to eight tons of carbon dioxide emissions annually.¹⁰ Because the majority of drivers drive less than 50 miles a day, he urged less focus on range anxiety, and also urged efforts to effectively engage EV dealers in coalition building and effective customer engagement.

Conclusions and Next Steps

The EV convening provided a platform for direct interaction and exchange of ideas through presentations, stakeholder input via online surveys, and moderated discussions during each session. While projecting the economical, societal, and environmental benefits of EVs, the speakers and participants highlighted the need to build partnerships among key stakeholders to secure these benefits. Speakers stressed the need for thinking outside the box when marketing EVs and building stakeholder support. Participants urged utilities—often trusted stakeholders—to develop simple, customer-friendly solutions to complex EV issues. Rate design, charging convenience, stakeholder incentives, and effective customer engagement were identified as issues that should be addressed as early as possible for intelligent EV adoption.

Building on the discussions and recommendations of the participants at the convening, ACEEE will launch an EV working group with utilities to develop and disseminate an array of approaches to integrating EVs into the grid. This working group will focus on building effective partnerships between utilities and other stakeholders, such as cities, that were identified as key partners during the convening. The working group will also develop and promote a set of best practices for EV integration and offer one-to-one technical assistance when needed.

⁹ https://aceee.org/sites/default/files/pdf/conferences/ev/shedd.pdf

¹⁰ https://aceee.org/sites/default/files/pdf/conferences/ev/willingham.pdf

Appendix

Convening agenda

AGENDA:

7:30 am – 8:30 am	Breakfast/Coffee
8:30 am – 9:30 am	Opening Session
8:30 am – 8:40 am	Welcome
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8:40 am – 9:30 am	Defining Beneficial Electrification and EV-Grid Integration

Interactive event using polling. Panelists will speak, then the audience and panelists will respond to key framing questions for the day.

- Steve Nadel, American Council for an Energy-Efficient Economy
- Commissioner Tim Echols, Georgia Public Service Commission

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9:30 am – 11:00 am Intelligent EV Adoption & Integration
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Opportunities and barriers to intelligent EV integration: panelists will identify EV policies and practices that support utility business models and system benefits while providing customers economic, environmental, and other societal benefits. Speakers will focus specifically on what actions they have taken to prioritize EV adoption and integration.

- Moderator: Anne Blair, Southeast Energy Efficiency Alliance (SEEA)
- Utility: Bill Copeland, Electric Power Board of Chattanooga
- State policy: Mary Beth Tung, Director of the Maryland Energy Administration
- EVSE: Sophie Shulman, Electrify America

11:00 am – 11:15 am Break

11:15 am – 12:30 pm Rate Design: Managing Demand & Unlocking Multiple Value Streams from EVs

Speakers will present perspectives on different rate designs followed by Q&A and facilitated discussion.

- Moderator: Erika Meyers, Smart Electric Power Alliance (SEPA)
- Utility: Chuck Caisley, KCP&L
- Utility: Kapil Kulkarni, Burbank Power & Water
- Non-utility expert: Chris Nelder, Rocky Mountain Institute (RMI)

12:30 pm – 1:45 pm Working Lunch

Short presentation followed by collaborative lunch group discussions with prompts from the speaker.

• Presenter: Corey Ershow (Lyft)

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1:45 pm – 3:00 pm EV Charging Systems: Investment, Ownership, and Operation
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Speakers will present different perspective on utility investment, ownership, and operation of EV charging infrastructure followed by Q&A and facilitated discussion.

- Moderator: Joe Halso, Sierra Club
- Utility: James Cater, Eversource
- Consumer advocate: Dave Kolata, Illinois Citizens Utility Board
- EVSE: Michelle Meyer, Greenlots

3:00 pm – 3:15 pm Break

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3:15 pm – 4:30 pm Putting Up Road Signs: Building Customer Engagement
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Who is engaging customers, and what can we learn from them? Speakers will discuss what kind of customer engagement we need & their successful models followed by Q&A and discussion.

- Moderator: Chuck Caisley (KCP&L)
- State policy: Commissioner Norm Saari, Michigan PUC
- Utility: Alan Shedd, National Rural Electric Cooperative Association (NRECA)
- Car manufacturer: Cornelius Willingham, Nissan North America

4:30 pm -5:00 Closing – Summary and Discussion of Next Steps

Discussion of next steps, including what actions utilities can take to support clean transportation beyond rates, infrastructure, and education.

Moderated by Grace Relf and Siddiq Khan, American Council for an Energy-Efficient Economy

5:00 pm – 6:00 pm Reception/Networking

Survey Questions and Results











A question or challenge I'm facing that I'd like the working group to address is...

Respond at PollEv.com/gracerelf542

"State lead by example"

"Incentivizing utilities to contribute to vehicle market transparency"

"Quantifying total energy effect from using evs"

"Addressing localized grid constraints"

"Multi-stakeholder engagement to launch programs that provide ev access to lmi communities"

"Ratebased charging infrastructure"

"making EV purchasing easier for buyers; think DriveElectric company in the UK which provides a one-shop stop for EV leasing including the installation of the residential charger in the cost of the lease"

"Procurement for city or state fleet"

"Best practices for municipalities"

"Affordable charging for people without home or workplace charging options"

"Fleet Electrification"

"Heavy-duty electrification"

"Heavy-duty electrification"

"Infrastructure impacts"

"Include air quality benefits in equity workgroup"

"Rural shared EV transit options"

"Business_case_for_EVs_for_my_Commission"

"Rebate programs"

"Ratepayer impact and cost effectiveness"

"Utility policy best practices"

"Smart chargers for homes"

"Dealer Engagement"

"Consumer Education"

"Funding Education & Outreach Initiatives"

Convening Attendee List

Name	Title	Organization
William Agee	Business Strategy Consultant	PPL Electric Utilities
Anne Arquit Niederberger	VP Market Development	Enervee
Tom Ashley	Vice President, Policy	GreenLots
Peter Banwell	Senior Manager	EPA
Allison Bially	Director	AESC, Inc.
Anne Blair	Director, Energy Efficient Transportation	SEEA
Celina Bonugli	Specialist, Clean Energy Innovation	World Resources Institute
Brandy Brown	Senior Consultant	CLEAResult
Chuck Caisley	Sr. VP, Marketing & Public Affairs, Chief Customer Officer	KCP&L
Jennifer Canseco	Head of Section, Policy & Programs	DNV GL
James Cater	Program Lead	Eversource Energy
Bill Copeland	Director, Business Intelligence	EPB

Stan Cross	CEO, Co-Founder	Brightfield Transportation Solutions
Andrea Denny	State and Local Energy and Environment Program	US EPA
Kathleen Doughty	Marketing/Communications Assistant	ACEEE
Tim Echols	Commissioner	Georgia Public Service Commission
Martha Morecock Eddy	Practice Leader	KCI Technologies
Bruce Edelston	President	Energy Policy Group
Rachel Ehrman	Energy Projects Coordinator	E4TheFuture
Corey Ershow	Transportation Policy Manager	Lyft
Garrett Eucalitto	Transportation Program Director	National Governors Association
Don Francis	Executive Director	Clean Cities-Georgia
Cicely Garrett	Deputy Chief Resilience Officer	City of Atlanta
Jason Gaschel	EV Program Manager	FP&L
Rachel Gold	Senior Manager, Utilities Program	ACEEE
Joshua Goldman	Senior Policy Analyst	Union of Concerned Scientists
Joe Halso	Associate Attorney	Sierra Club
Nadine Hanhan	Sr Utility Analyst	Oregon Public Utility Commission
Ed Harmon	Electric Transportation Manager	Southern Co./Georgia Power
Kenneth Hernandez	Business Development Manager	TECO - Tampa Electric
George (Clay) Hoover	Program Manager	TVA
Andrew Horstman	Manager of Load Response	Wabash Valley Power
Samantha Houston	Vehicles Analyst	Union of Concerned Scientists
Jean-Ann James	Program Associate	Turner Foundation

Eric Junga	Senior Research Analyst	ACEEE
Siddiq Khan	Sr Researcher	ACEEE
Peter King	Project Manager - Electric Transportation	Duke Energy Florida
David Kolata	Executive Director	CUB Illinois
Dory Larsen	EV Program Associate	SACE
Bill LeBlanc	Chief Instigation Agent	E Source
Dan Lloyd	Mgr of Renewables & Planning	Montana Energy Office
Matt Macunas	Legislative Liaison & Sr. Marketing Manager	Connecticut Green Bank
Mandy Mahoney	President	SEEA
Landon Masters	Clean Transportation and Communications Specialist	Palmetto State Clean Fuels Coalition
Michelle Meyer	Senior Marketing Manager	Greenlots
John Morris	Vice President	D+R International
Debbie Murray	Sr. Program Manager	TVA
Erika Myers	Research Director	Smart Electric Power Alliance
Steve Nadel	Executive Director	ACEEE
Chris Nelder	Manager - EV-Grid Initiative	Rocky Mountain Institute
Stacy Noblet	Principal	ICF
Brad Norman	Electric Transportation Market Specialist	Georgia Power
Grace Relf	Senior Research Analyst; Utilities	ACEEE
Chris Rice	Director of Programs	Maryland Energy Administration
Norm Saari	Commissioner	Michigan Public Service Commission
Julie Scrivner	Consultant	EMI Consulting

Alan Shedd	Director of Sustainability	Oglethorpe Power Corporation
Sophie Shulman	Manager, Partnerships & Business Development	Electrify America
Michael Smith	VP Business & Technology Strategy	Electric Cooperatives of South Carolina
Bob Sorvillo	Operating Partner	Moreland Altobelli
Matt Stanberry	VP	Advanced Energy Economy (AEE)
Emilie Stone	Head of DSM Products	Tendril
Stephanie Stuckey	Board Member	Clean Cities Georgia
Terry Travis	Co-Founder	EVHybridNoire
Mary Beth Tung	Director	Maryland Energy Administration
Jeff Turner	Consultant	Dunksy
Marc Vinson	Sr. Regulatory Affairs Rep	Georgia Power
Mike Waters	Director Utility Solutions	ChargePoint
Amber Weaver	Sustainability Officer	City of Asheville
Krista Williams	Consumer Marketing Specialist	Cobb EMC
Cornelius Willingham	Manager, Electric Vehicle Fleet Business Development	Nissan