March 21, 2019

Beneficial Electrification of Transportation

File No. EW-2019-0229 Working Case Regarding EV Charging Stations and Staff Workshop

Jefferson City, MO

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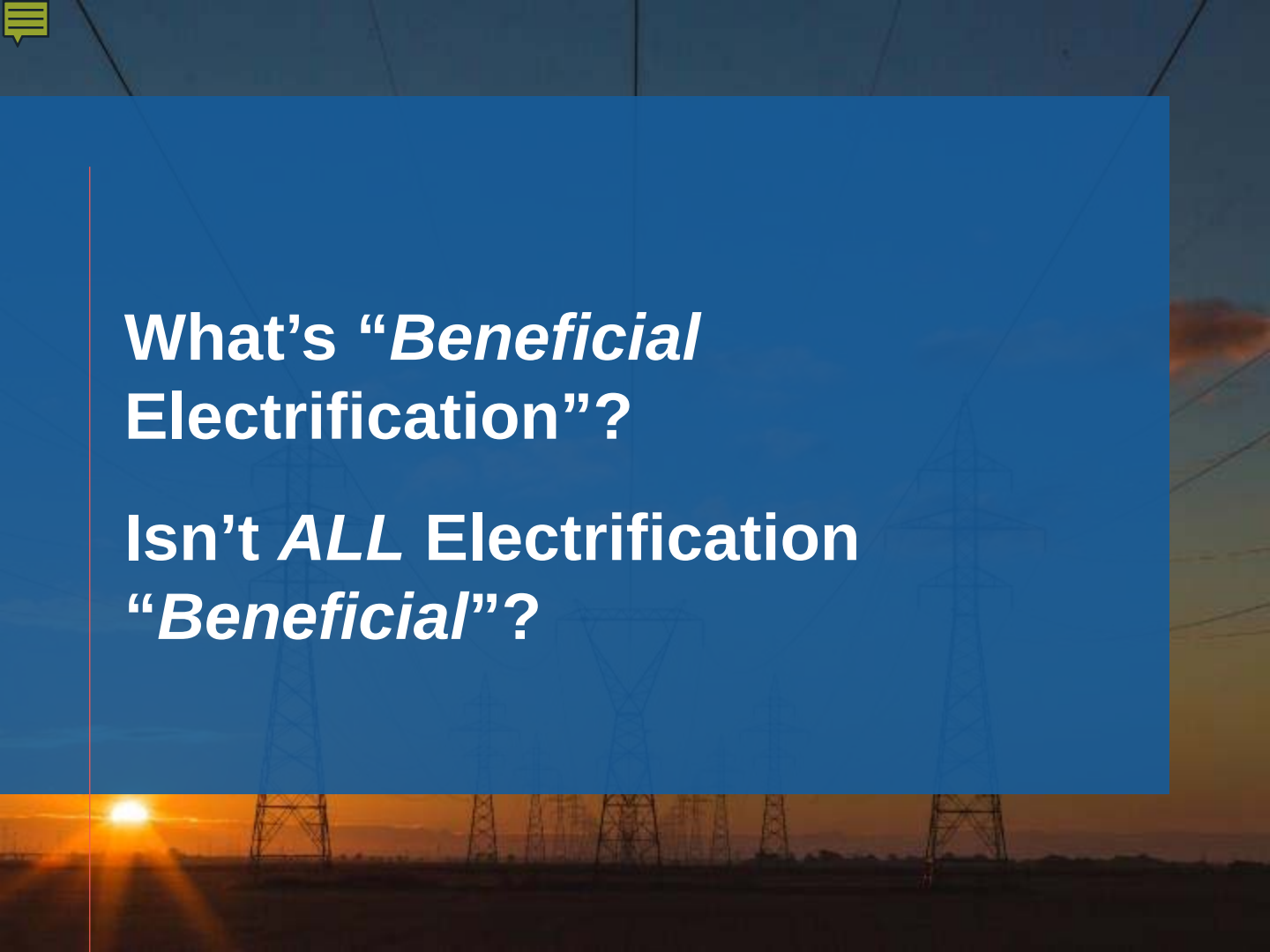
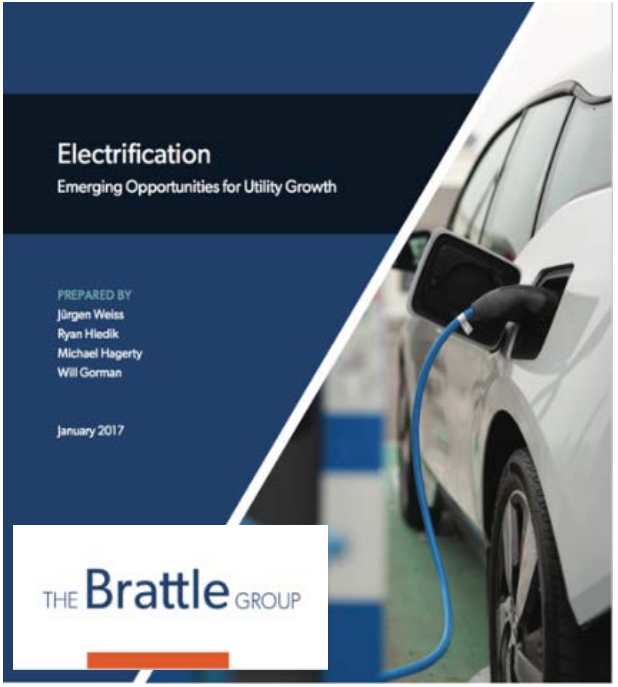
Outline

1. ***Beneficial Electrification*** introduced
2. **Context**: What is the charging ***infrastructure gap***, and why are utility regulators getting involved?
3. **Key** to *beneficial* transportation electrification: smart charging
4. Recent utility proposals and commission decisions: ***What's happening on the ground?***


What's "*Beneficial* Electrification"?
Isn't *ALL* Electrification "*Beneficial*"?

Is all electrification created equal?



- *Brattle: "Utility sales could nearly double by 2050"!*
- *Is it all about **load growth**?*

Beneficial Electrification (BE) - Three Conditions

1. Saves Customers Money Over Long-Term

2. Reduces Environmental Impacts

3. Enables Better Grid Management

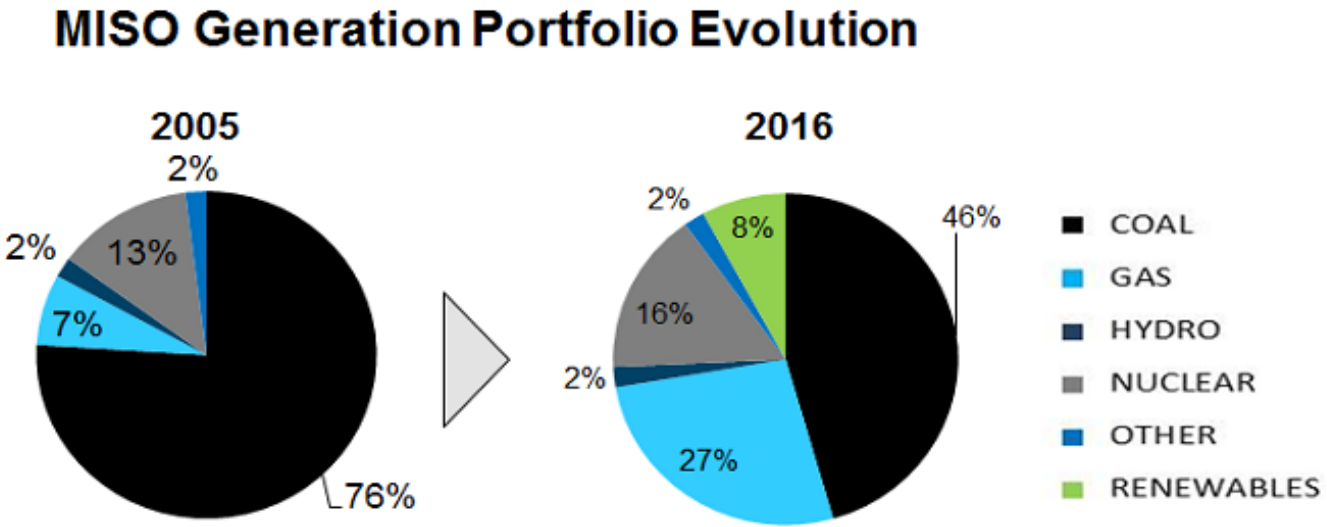
1. Saves Customers Money Long-Term

Efficiency Across Fuel Types

Source: JJ MCoy, "Building "good load" to reduce carbon emissions", 2016. http://nwenergy.org/wp-content/uploads/2016/01/Transpo-Electrification-TE-Workpaper-1-25-2016-FINAL.pdf.zip

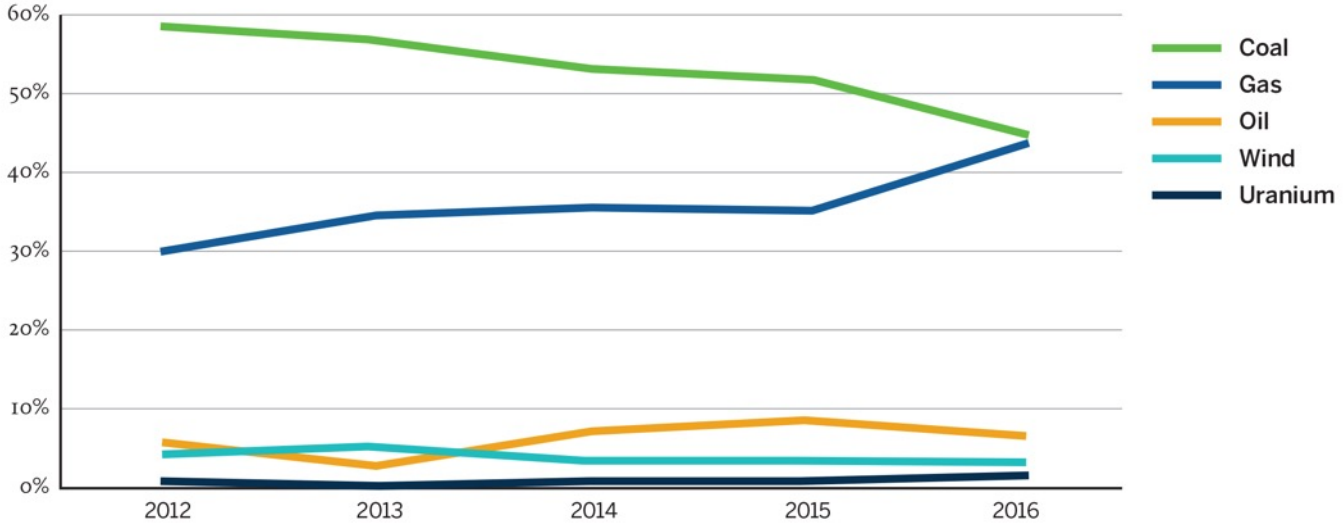
2. Reduces Environmental Impacts

Power sector fuel mix is changing: MISO example



http://www.misomatters.org/2017/03/3-electricity-industry-issues-we-are-watching-in-2017/

What are the marginal emissions?



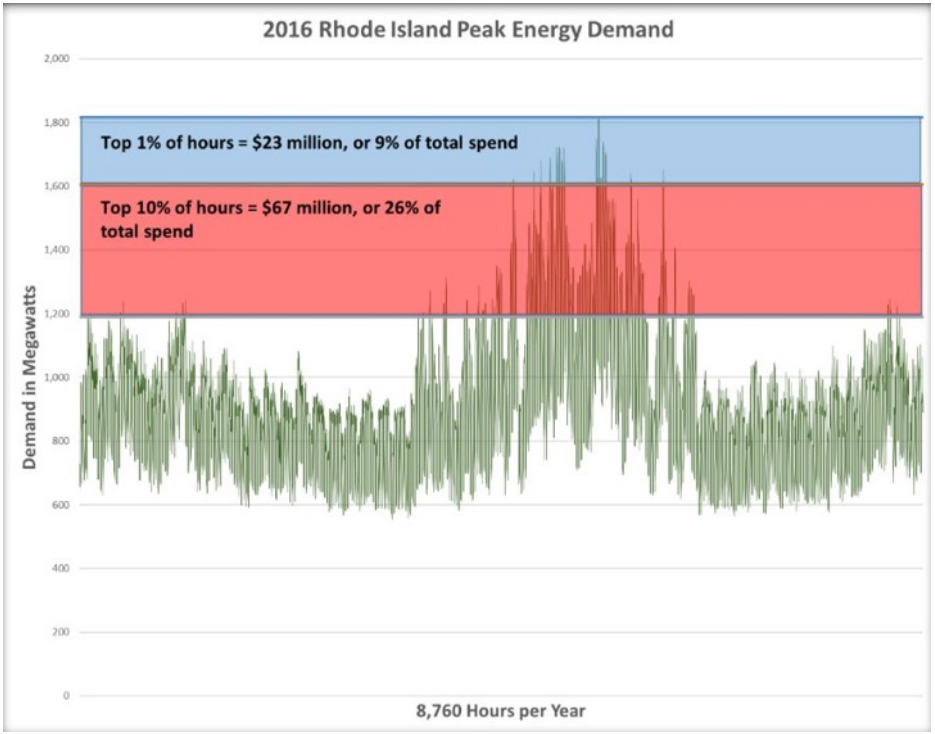
Municipal waste, demand response, interface, and other fuels are marginal units less than 1% of the time and excluded from the chart above.

Adapted from: PJM Interconnection. (2017). *2012-2016 CO_2, SO_2 and NO_X Emission Rates.*

3. Enables Better Grid Management

Avoid High-Cost Hours

- Top 1% of hours = 9% of total spending
- Top 10% of hours = 26% of total spending



Source: Rhode Island Power Sector Transformation, Phase One Report to Governor Gina M. Raimondo (November 2017)

- Electrification can mean innovation and opportunities

- ***Beneficial*** Electrification is a framework to help you sort through those opportunities

- Circumstances will vary:
  - Analyze for local conditions and trends
  - ID opportunities
  - Remove barriers
  - Consider pilots
  - Educate consumers

EV Charging – Coming to a Utility Commission Near You

Utility Commissions in the Driver's Seat

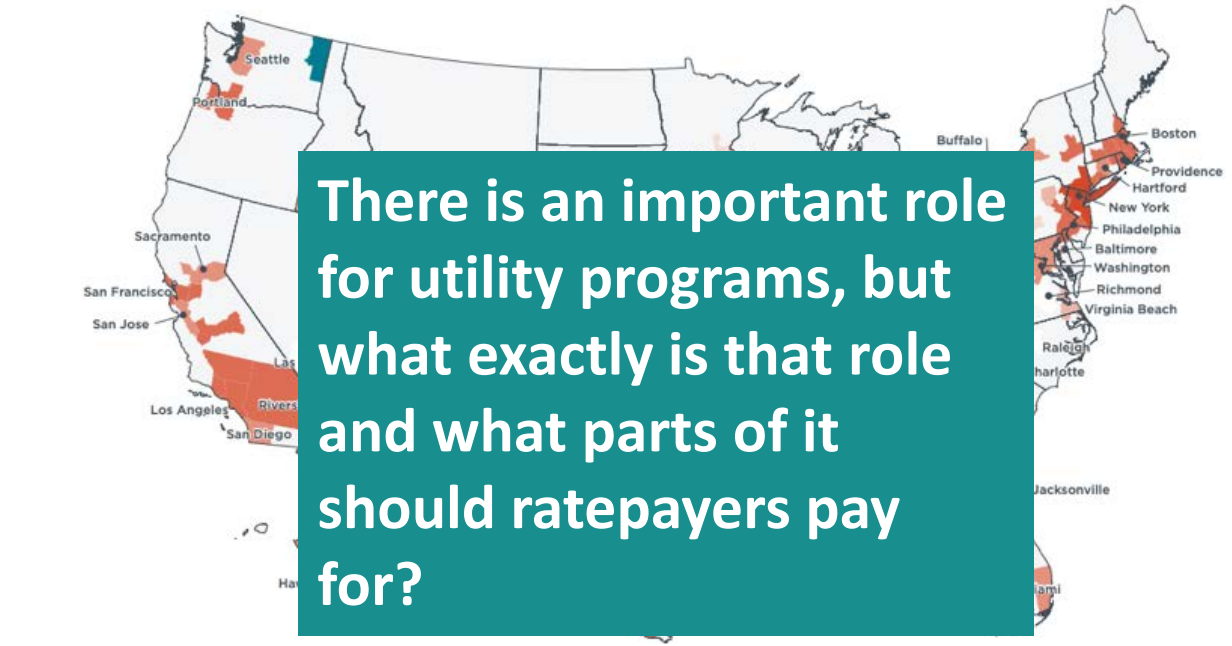
Utility regulators are increasingly being asked to evaluate investments in EV charging infrastructure:

- Utility proposals
- State policy goals
- Market trends

Utility Commissions in the Driver's Seat

"The Commission's authority over EV charging programs is consistent with [our] general duty to consider "the economy of the State, the conservation of natural resources, and the preservation of environmental quality""
- Maryland PUC, January 2019

What is the charging infrastructure gap?



Source: Nicholas, Michael, Dale Hall, and Nic Lutsey, *Quantifying the Electric Vehicle Charging Infrastructure Gap Across US Markets*, ICCT, January 2019.
https://www.theicct.org/sites/default/files/publications/US_charging_Gap_20190124.pdf

Regulators Must Balance Multiple Priorities

- Equitable access
- Preserving/promoting competition
- Increasing EV adoption
- Environmental concerns
- Reducing costs
- Fair to ratepayers
- CA's evolution: from *prohibiting* to *requiring* utility investment

Regulators Must Balance Multiple Priorities

"…the proposed decision … balances well these competing aims of accelerating EV adoption, enabling competition, reducing cost and being sustainable and fair investments for EV drivers and ratepayers"

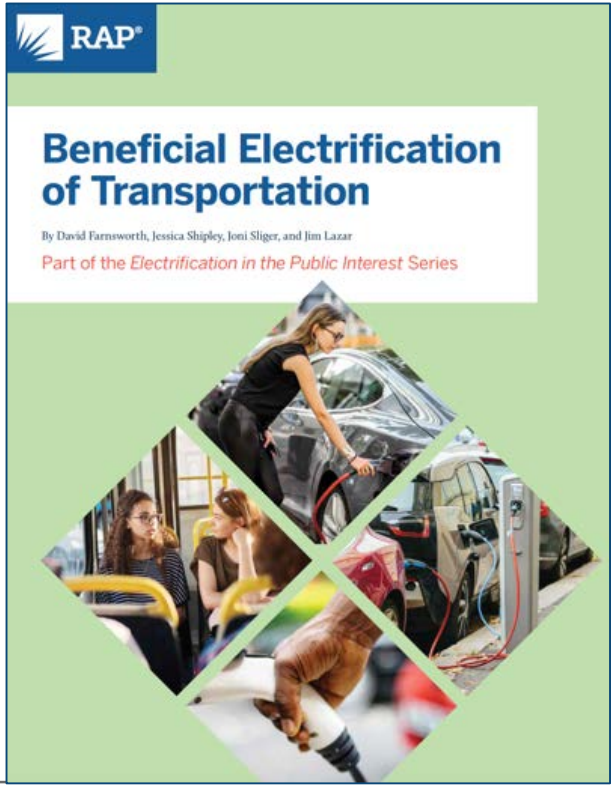
- Commissioner Carla Peterman, regarding the CPUC May 2018 decision approving $750 million in EV infrastructure spending

http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M215/K380/215380424.PDF

The key to the *beneficial* electrification of transportation: smart charging.

Beneficial Electrification of Transportation

- Reduces costs for consumers
- Lowers emissions
- Benefits the grid
  - Reduces renewable curtailment
  - Doesn't add to peak
  - Increases utilization of existing infrastructure

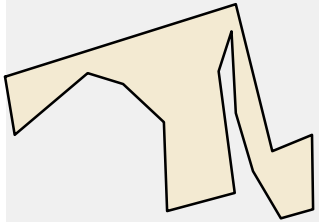


https://www.raponline.org/knowledge-center/beneficial-electrification-of-transportation/

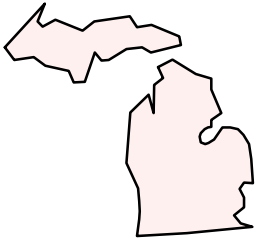
What's happening on the ground?

Residential Charging

Key issues: cross-subsidization, increasing EV adoption, energy efficiency, encouraging off-peak usage



Maryland (Jan 2019): rebates for *incremental* cost of smart L2 chargers; customers must enroll in TOU



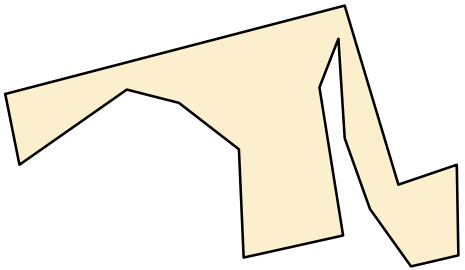
Consumers Energy (Jan 2019): $500 rebate for EV drivers with nighttime EV rate

SDG&E (May 2018): rebate for EVSE approved, utility ownership of customer-side infrastructure denied

Multi-unit Dwelling Charging

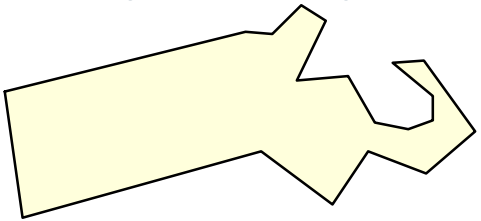
Key issues: lack of private market investment, “right to charge”, up front cost, equitable access

Maryland (Jan 2019):
Rebates for up to 50% of charger costs;
utilities not allowed to own EVSE



Massachusetts:

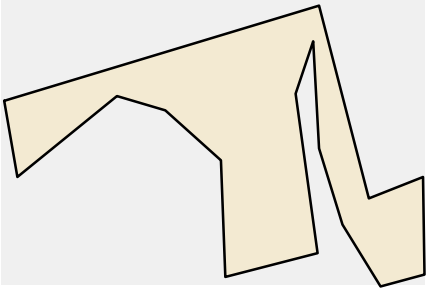
- Eversource (2017): 4000 “make ready” stations, 10% in low income;
- Nat’l Grid (2018): rebates for 600 L2 and 80 DCFC, performance incentive for installing 75% of target sites



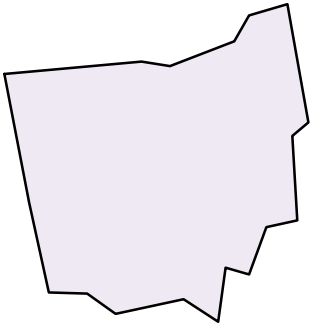
Workplace and Commercial Charging

Key issues: important for a subset of EV drivers, electric ratepayers' role?, reforming rate design

Maryland:
rejected utility rebate proposals; approved 5-year demand charge waiver



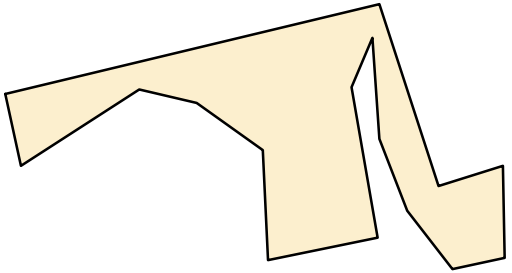
AEP (**Ohio**) (April 2018):
rebate for up to 50% of L2 charger cost, some may be located at workplaces



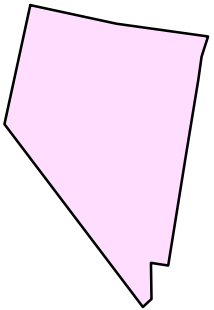
California (2016):
approved all 3 utilities for workplace and public charging investment; since then, focused on reforming rate design

Public Charging

Key issues: preserving competition, lack of private market investment, reforming rate design



Maryland (Jan 2019):
approved limited deployment,
highlighted need to gather data on charging behavior,
utilities can own and operate,
must be at public properties

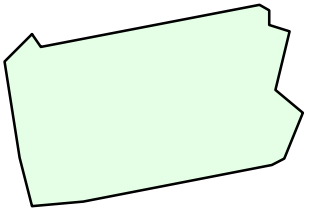


NV Energy (June 2018): Rebates for public charging on NV electric highway;
must file demand charge transition tariff for DCFC

Other Transportation Electrification

Key issues: local environmental benefits, up front cost barriers, reforming rate design

California (2018):
all three large IOUs approved to implement programs to electrify airport, port, medium and heavy duty fleets, transit and school buses



Duquesne Light (PA) (Dec 2018):
$500k for DCFC for Port Authority of Allegheny County's first electric transit buses

Some Takeaways

Takeaways

- Utility regulators are increasingly being asked to evaluate investments in EV charging infrastructure
- In doing so, regulators must balance multiple regulatory and policy priorities
- Charging can and should be done in a way that reduces costs and emissions and benefits the grid
- State agency coordination can improve data, analysis, policy, and outcomes

Beneficial Electrification Resources from RAP

- Ensuring Electrification in the Public Interest
- Beneficial Electrification of Space Heating
- Beneficial Electrification of Water Heating
- Beneficial Electrification of Transportation
- Utilities Can Get a “LEG” Up with Beneficial Electrification—But Regulators Also Have to be Ready
- Environmentally Beneficial Electrification: The Dawn of Emissions Efficiency (Electricity Journal)

About RAP

The Regulatory Assistance Project (RAP)® is an independent, non-partisan, non-governmental organization dedicated to accelerating the transition to a clean, reliable, and efficient energy future.

Learn more about our work at raponline.org

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