

In Pursuit of Beneficial Electrification

Kate Merson

Senior Director, Customer Energy Solutions



E Source

Midwest Energy Efficiency Conference

What has happened in just 3 years

- Renewable-energy and emissions-reduction goals have skyrocketed.



- Renewable energy costs have plummeted.

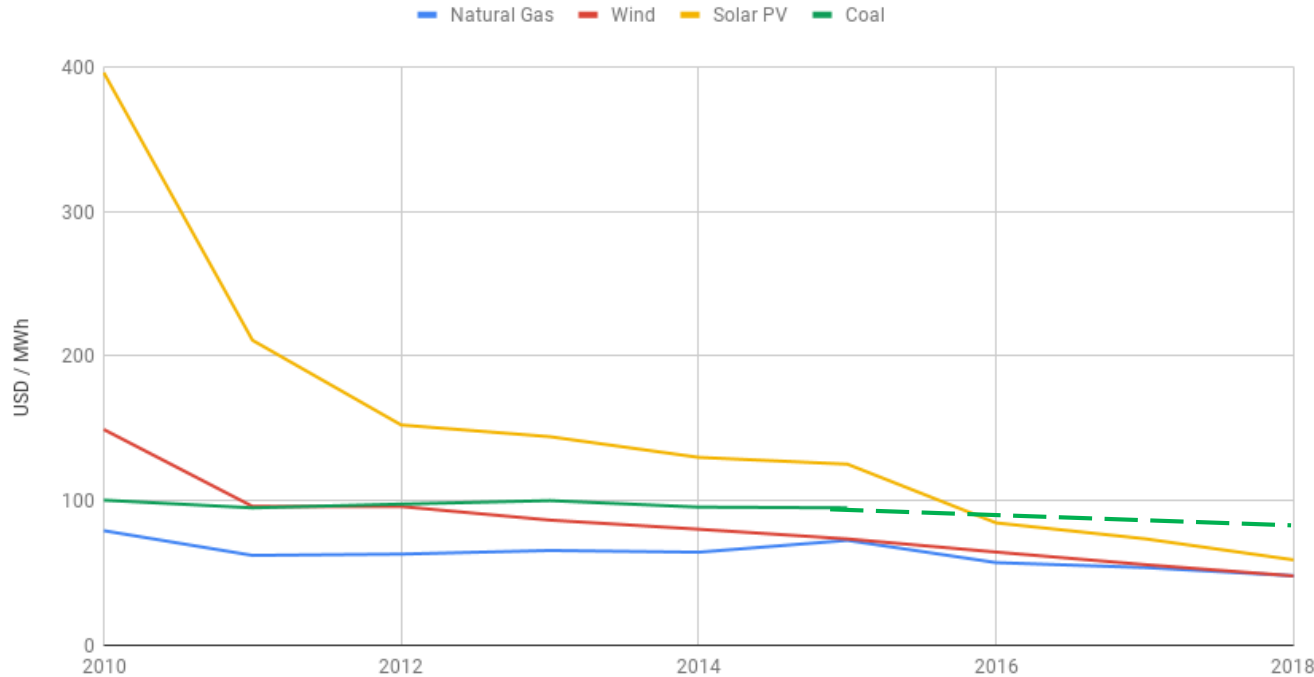


- Electrification now has far different implications.



Rapid decrease in costs of wind/solar

Levelized Cost of Electricity By Source



WIND: Costs 67% less compared to 2010

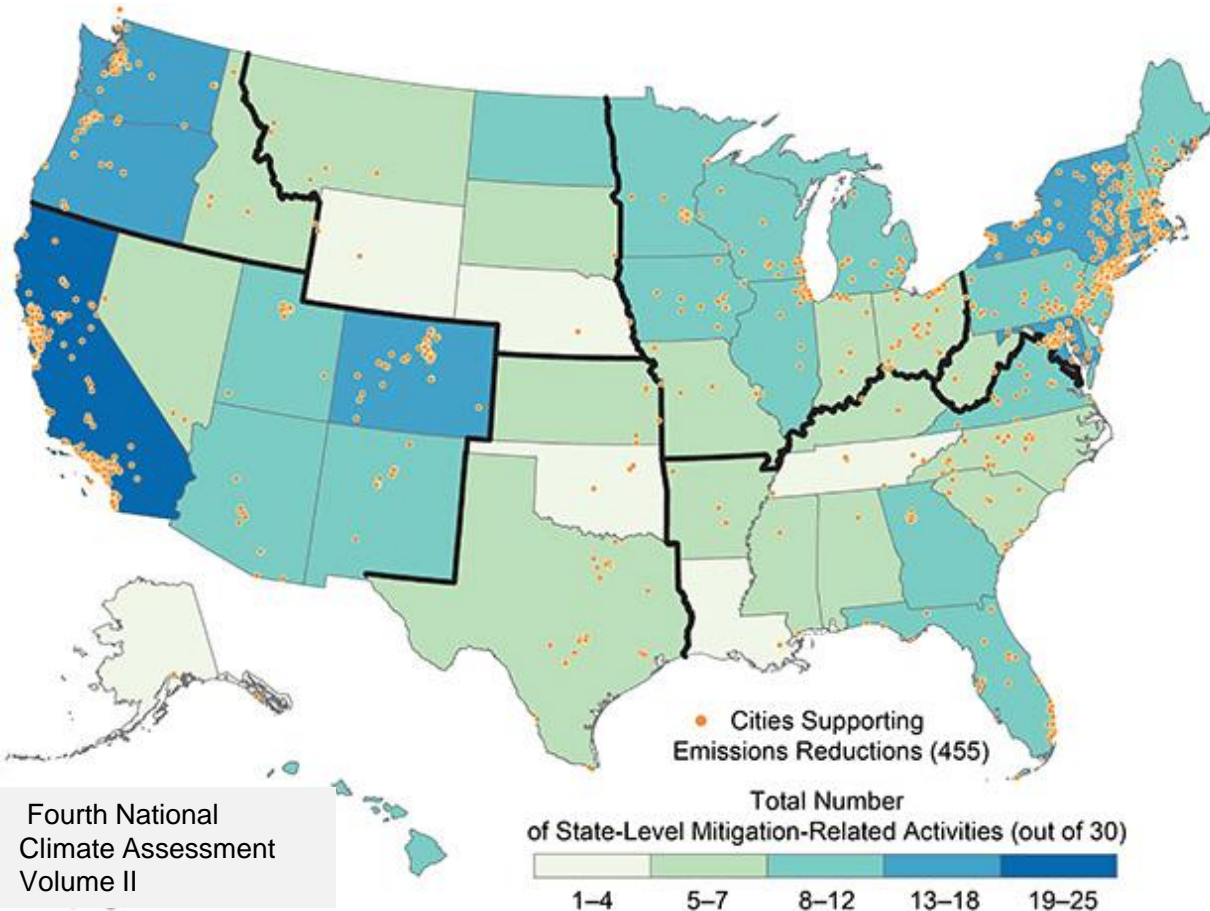
SOLAR: Amazing 83% less cost compared to 2010

NATURAL GAS: 37% lower costs compared to 2010

COAL: Smallest change, at only 8% lower costs.

Source: EIA & Lazard

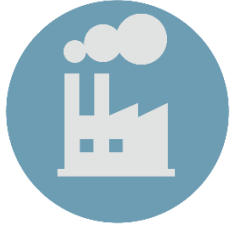
Cities and communities are taking action*



455 cities support climate goals,
Over 100 have committed to 100% renewable power or carbon neutrality

*as of 10/15/18

What are we trying to achieve with electrification?



Decarbonizing and improving environments



Optimizing the electric grid and reduce electric rates



Reducing overall energy costs for consumers, including non-participants

A commitment to equity

A new report, *Equitable Building Electrification: A Framework for Powering Resilient Communities*, highlights the benefits for low-income residents. Building electrification can have significant benefits for low-income communities.

The report was produced in partnership between
The Greenlining Institute and California's Energy
Efficiency for All coalition.

Energy utilities are unique stakeholders

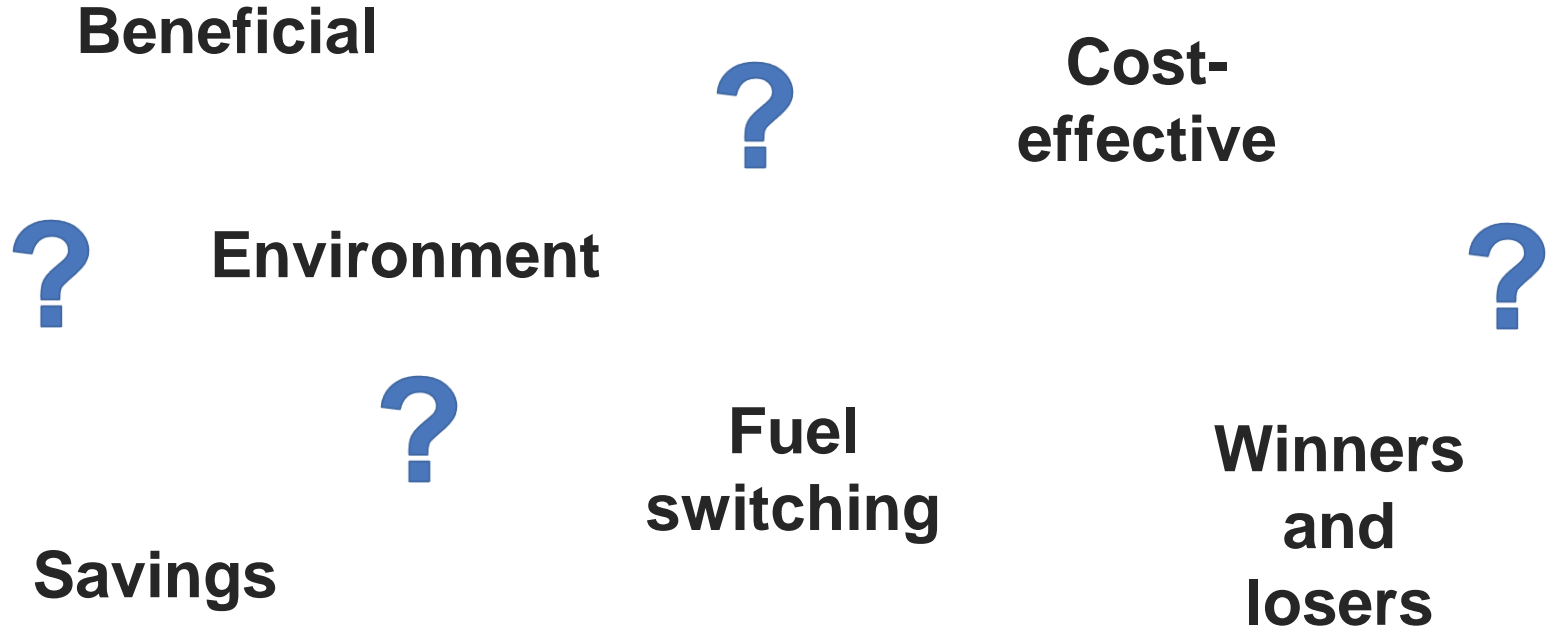
- ✓ Customer relationships
- ✓ Access to capital
- ✓ Infrastructure development
- ✓ Energy-supply choices
- ✓ Rate design/pricing



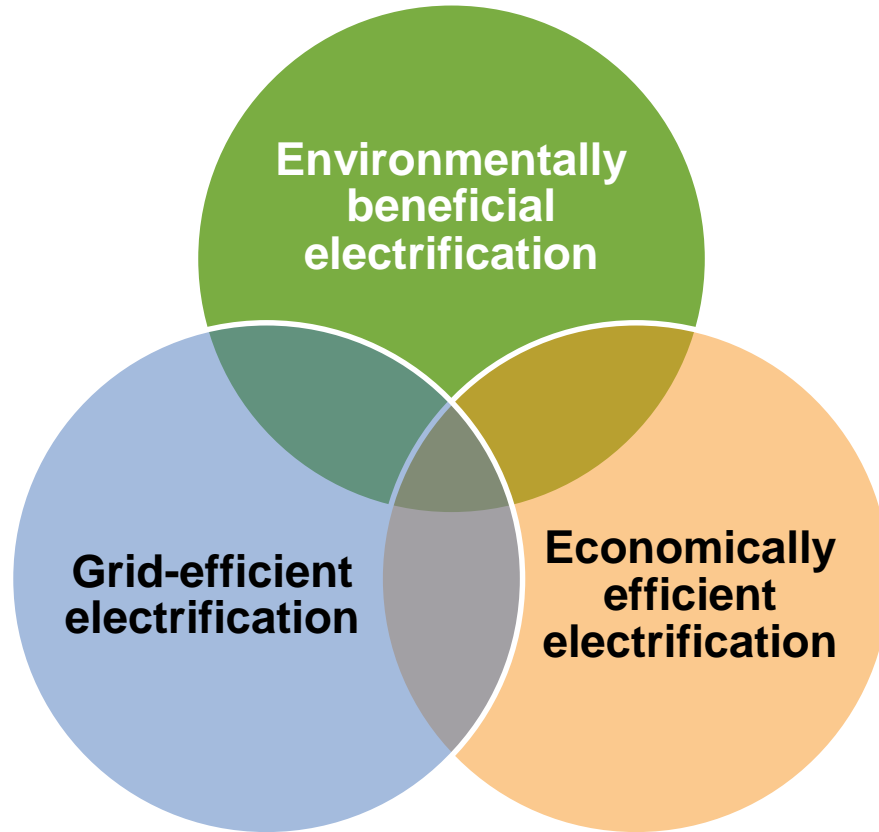


The electrification framework

Getting to yes ... use the same terminology



Defining beneficial electrification



Electrification Benefits Matrix

Economic

- Lower bills
- Lower rates
- Savings leads to spending \$
- Non-participant benefits
- Health benefits

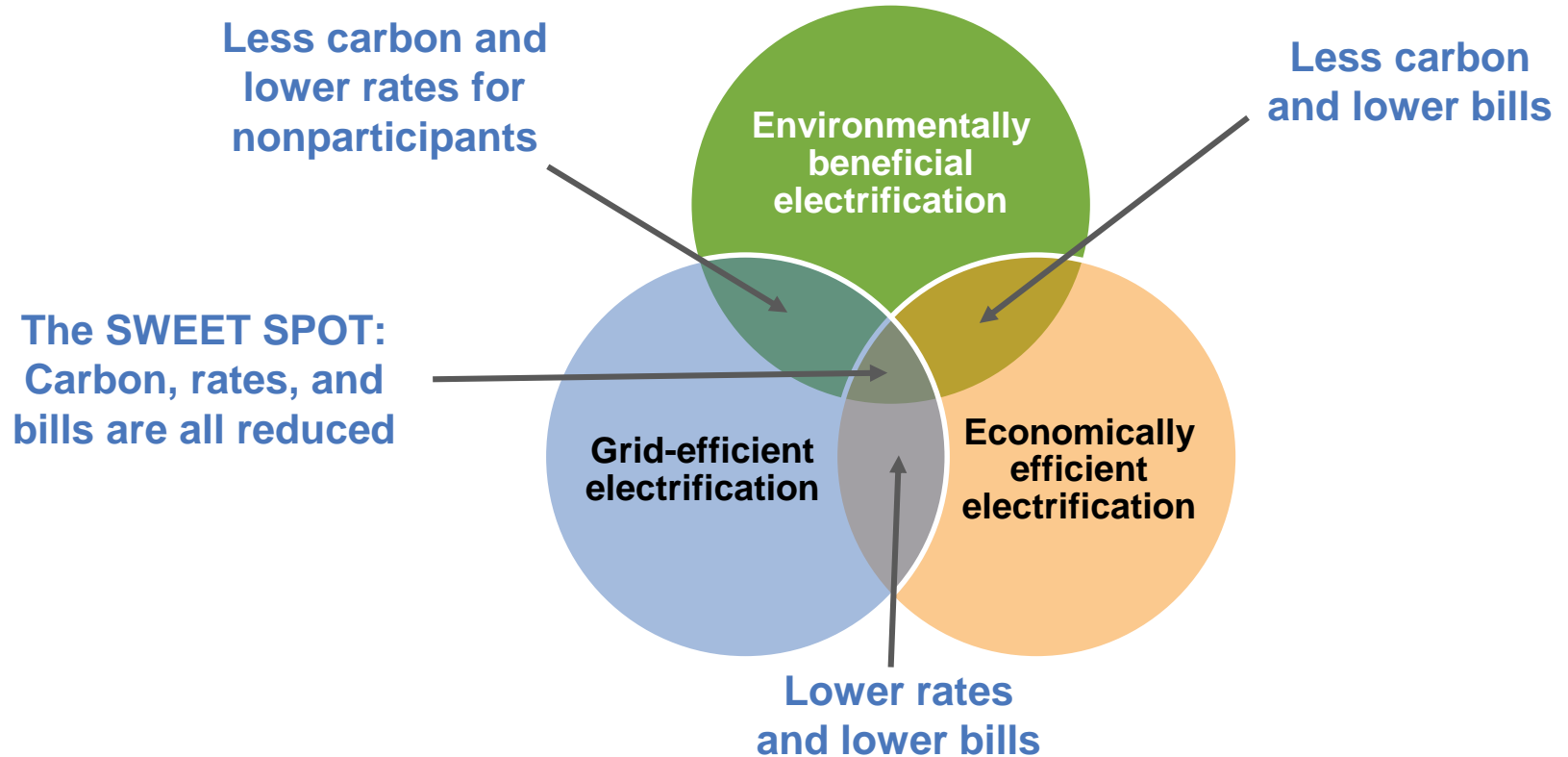
Environment

- Carbon reduction
- Local air pollution improvements
- Reduction in health problems and costs

Grid

- Built in battery storage in EVs
- Opportunity to expand pricing options, smart meter benefits
- Load factor improvements
- Allow more renewables on grid

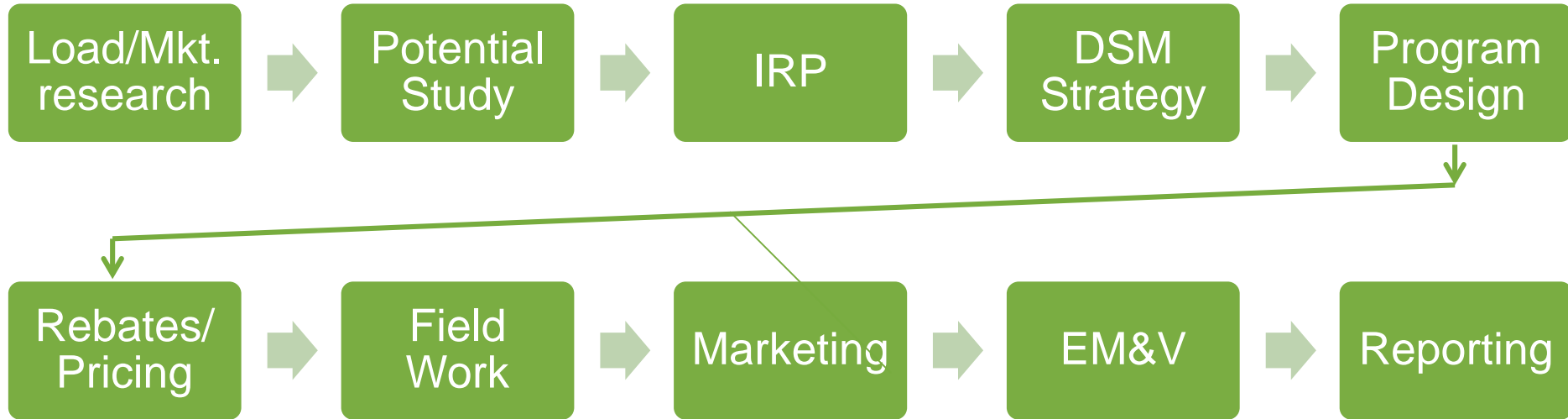
Defining beneficial electrification



The background of the slide is a top-down view of a wooden desk. On the desk, there is a laptop with a person's hands typing on the keyboard, a smartphone lying to the left, and a white coffee cup to the right. The entire image is overlaid with a semi-transparent blue filter. A white rectangular box is centered on the image, containing the title text.

Learning about Electrification through the DSM Lens

Typical DSM Program Cycle



A Twist on Cost Effectiveness Tests

Creating a cost-effectiveness test for beneficial electrification helps us optimally allocate our resources by rigorously comparing the costs and benefits related to each sector of our beneficial-electrification framework.

Key principles for an electrification cost-effectiveness test

- Values electrification as one of many resources
- Reflects policy goals on carbon, rates, reliability
- Takes into account all relevant impacts
- Is forward-looking, taking full measure life into account
- Is transparent

Adapted from [National Standard Practice Manual](#)

Trends in cost-effectiveness evolution

Massachusetts lays
ground for
electrification
resource test

California authorizes
DSM funds for fuel
switching and part of
broader TRC and
PACT

In 2020, E Source is doing an industry benchmark to look at how cost-effectiveness treatments are evolving.

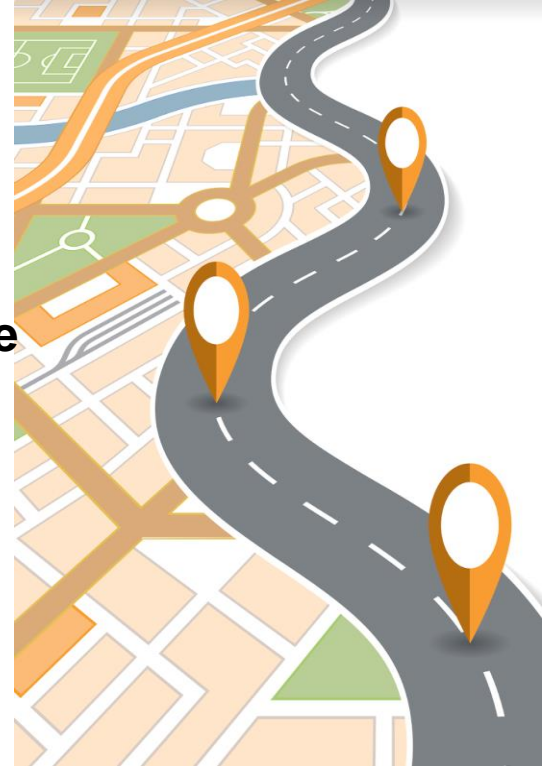
For more information contact kate_merson@esource.com



Regulatory incentives for beneficial electrification

Why Should Electrification Programs Receive Regulatory Incentives?

- **Well-designed and executed electrification can bring large-scale benefits to customers and society.**
- **Utilities are uniquely positioned to execute beneficial electrification programs.**
- **Utilities, especially those with decoupling, may not have a [strong enough] financial incentive for electrification**
- **Oversight will ensure programs are cost-effective and are achieving stated goals**
- **Environmental urgency should drive specific goal-based actions in electrification, which would be accelerated with incentives.**



Beneficial-electrification incentive maturity

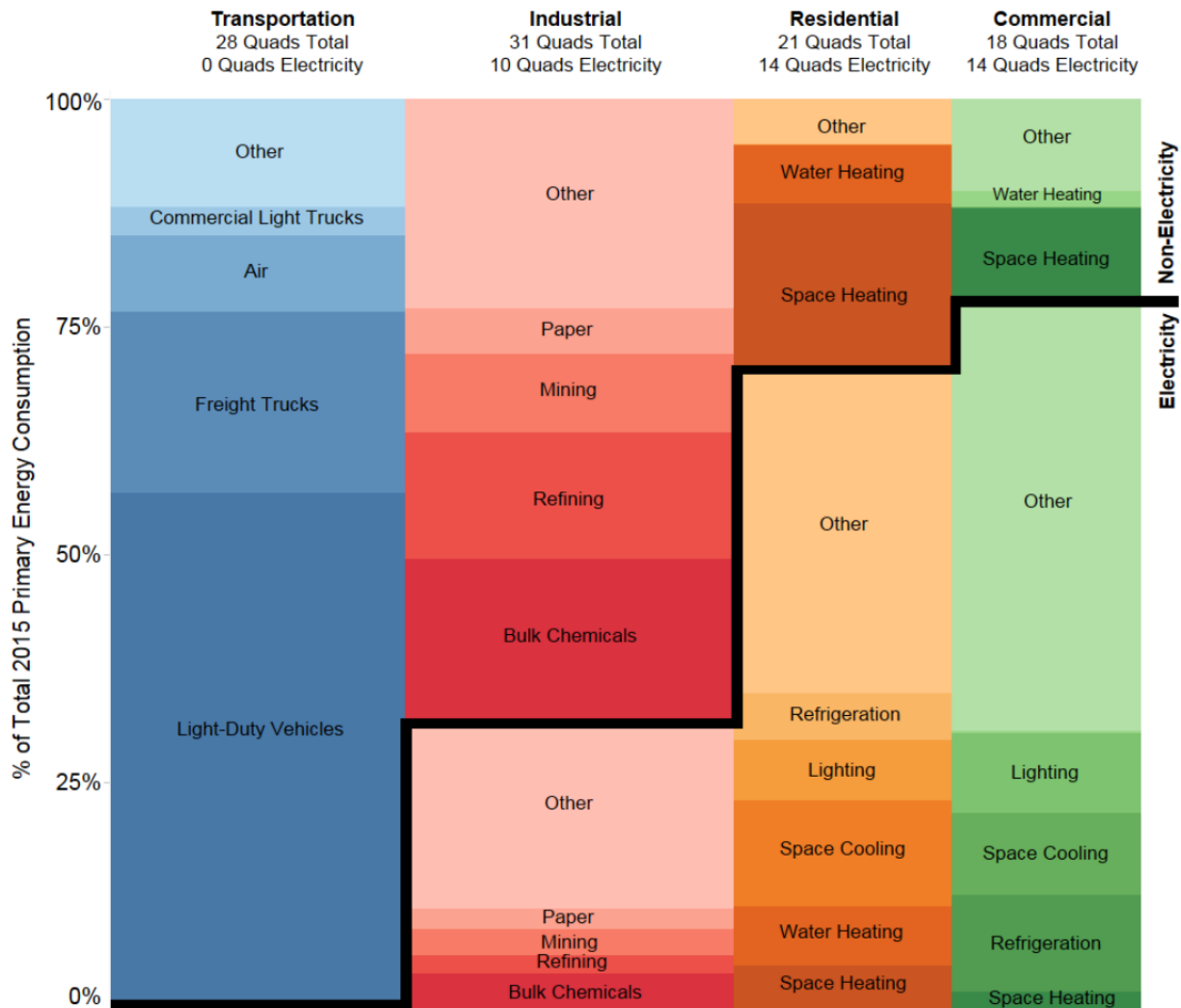




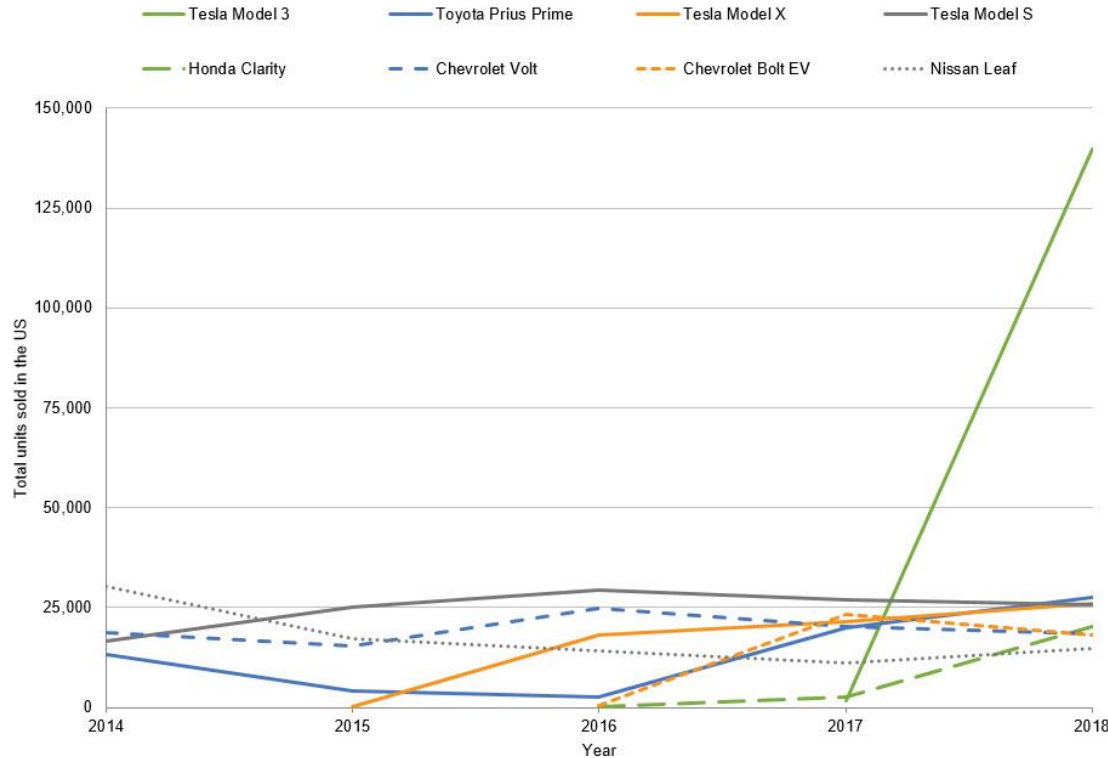
Transportation Electrification

What's the electrification potential?

Source: NREL, [Electrification Futures Study](#)



Sales of the top 8 EV models



Note: The models listed represent the top eight electric vehicle models sold in 2018.

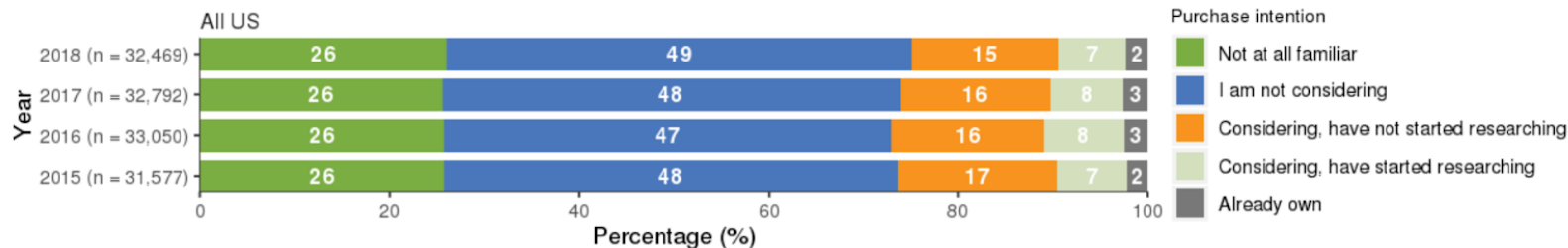
© E Source; adapted from carsalesbase.com;
data from manufacturers

“Do not count on the OEMs [car companies] to promote electric vehicles. Utilities must play that role for them to succeed.”

Nigel Zeid, Top Nissan Leaf sales agent nationally, recent E Source presentation

Considering purchasing an EV

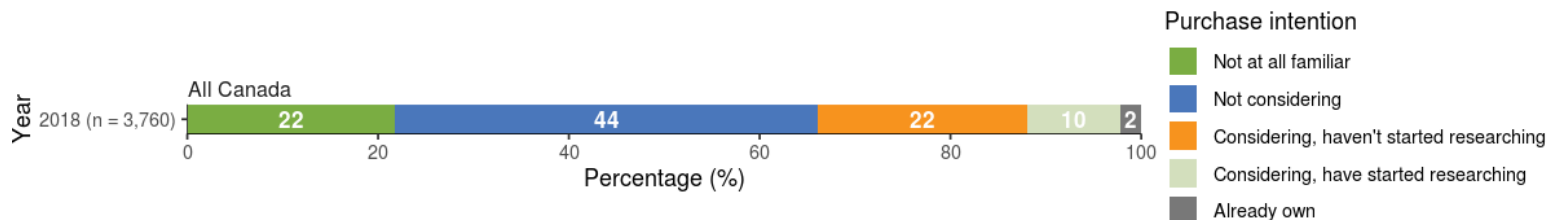
National residential data



Base: All respondents.

Question C3_5: Which statement best describes the stage you are at in the purchase process for the following green or renewable technologies within your primary residence? All-electric vehicle that plugs in to charge

Note: Data may not add to 100% due to rounding. Percentages shown in the charts reflect weighted data; sample sizes (n) are based on unweighted data.



Base: All respondents. Use caution when sample sizes drop below n = 30.

Question S4_3: All electric vehicle that plugs in to charge: Which statement best describes the stage you are at in the purchase process for the following green/renewable technologies?

Note: Data may not add to 100 percent due to rounding. Percentages shown in the charts reflect weighted data; sample sizes (n) are based on unweighted data.

© E Source (2018 Claritas Energy Behavior Track)

EV success is not a guarantee

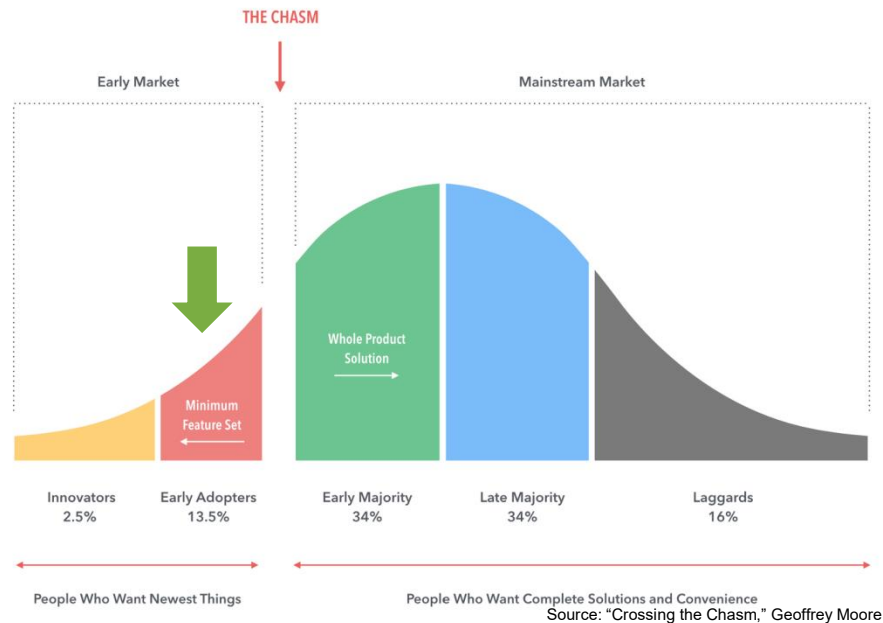
Utilities can help push EVs by doing *targeted marketing* rather than assuming everyone is “EV ready.”



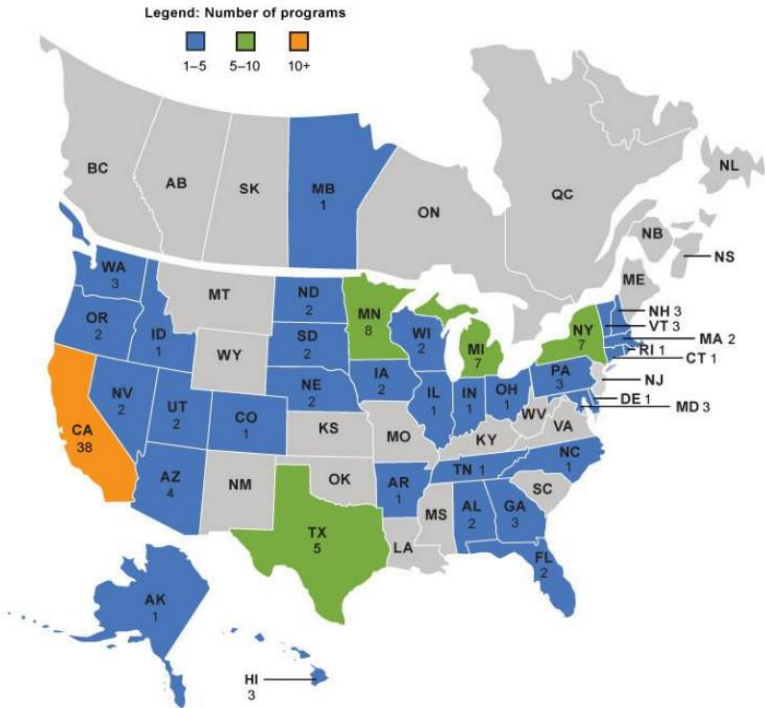
Source: "Crossing the Chasm," Geoffrey Moore

Early adopters (13.5%)

- Visionaries
 - Serve as the opinion leaders
 - Have a natural desire to be trendsetters (Tesla)
 - Serve as role models within their social group
 - Adventurous (Tesla)
 - Not necessarily cost sensitive (Tesla)
 - Excellent test subjects to pilot the innovation
 - Don't require a full solution set
-
- **Circa: 2019 to 2023**



EV pilot and program information from our catalogue of EV initiatives



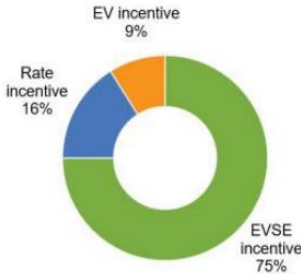
© E Source; data from utility websites and the US Department of Energy



Notes: EV = electric vehicle; EVSE = electric vehicle supply equipment.

© E Source

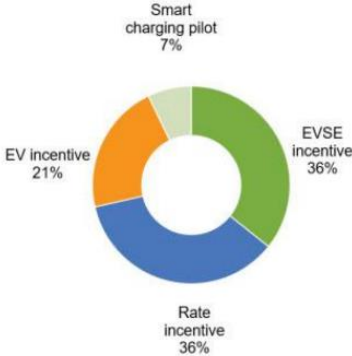
Commercial incentives



Notes: n = 56 programs. EV = electric vehicle; EVSE = electric vehicle supply equipment.

© E Source

Residential incentives



Notes: n = 70 programs. EV = electric vehicle; EVSE = electric vehicle supply equipment.

© E Source

Valuable Role That Utilities Can Play



Understand buyers:

- Ethnographic research
- Quantitative research
- ID next set of buyers
- Create segments
- ID hot buttons, barriers



Motivate buyers:

- Advise about EVs
- Promote Benefits of EVs
- Tie to new technology, convenience, fun
- Connect to utility brand
- Social media
- Direct email



Create buyer experience:

- Bulk buy/lower \$
- Ride and drives
- Workplace, fairs, sporting events
- Train salespeople
- Overcome barriers, fears
- Onboarding, understand rates, charging



Enhance driver experience:

- Home charging
- Off-peak rates
- Billing/benefits
- Work charging
- Public charging
- Engage through social media
- Rewards

Table of contents



Study background	<u>3</u>
Interest in DER technologies	<u>4</u>
Customer approach and motivation for purchasing DER and electrification technologies	<u>13</u>
Building-electrification technologies interest, adoption, and motivations	<u>17</u>
EV perceptions, interest, and satisfaction	<u>21</u>
EV charging station information needs, interest in EV time-of-use (TOU) rates, and barriers	<u>27</u>
Home battery storage perception, information, and satisfaction	<u>32</u>
On-site and community solar preferred provider, information needs, and satisfaction	<u>38</u>
Green pricing preferred provider, information needs, and satisfaction	<u>46</u>
Additional resources	<u>51</u>

E Source [2019 Utility DER & Electrification Benchmark](#)

DER Strategy Service

The DER Strategy Service covers pilots, programs, rates, business case and overall strategy for:

- Electrification
- Electric vehicles
- Behind-the-meter battery storage
- Green pricing programs and green tariffs
- Rooftop solar
- Community solar
- Microgrids
- Grid-edge / smart cities



Thank you! Questions?



Kate Merson
Research Practice Director
DSM, E Source
303-345-9145

kate_merson@esource.com

Have a question? Ask E Source!

Submit an inquiry:

www.esource.com/question

You're free to share this document in its entirety inside your company. If you'd like to quote or use our material outside of your business, please contact us at customer_service@esource.com or 1-800-ESOURCE (1-800-376-8723).