Emissions and Grid Interactive Efficient Buildings

Presentation for NASEO Webinar

The Regulatory Assistance Project (RAP)®

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Outline

• Marginal Emissions Matter
• Key Strategies for Buildings
• Opportunities in State Policies
• Conclusions
Ultimately, any question about the value of an electricity service must consider…

“value to whom”?
2 Marginal Emissions Matter
Timing is Everything
PJM NOx emissions 2014-2018

Annual Use of Supply
What information is needed and why?

• Emissions data – annual, seasonal, hourly
• Comparison to demand data
• Identification of most important days, month, hours
• Identification of which loads can be shifted and how
3 Strategies for Buildings
Put Efficiency First!

Reduces system cost

Provides thermal storage
Recognize the Value of Flexible Load

Electricity demand (kW)

7 AM  12 PM

4 pm

12 am

Reduce AM peak load

Reduce PM peak load

use of wind power

use of solar power
Shape, Shift, Shed and Shimmy

DR Service Across Timescales to Meet Future Grid Needs

Rate design should make the choices the customer makes to minimize their own bill consistent with the choices they would make to minimize system costs.
You have the Power

- Program design
- Program evaluation
- Ensuring environmental impacts are valued
- Cross-agency collaboration to achieve goals
Conclusion
Conclusions

• Marginal emission info key to maximizing benefits of flexible load
• State policy, program and regulatory design influences costs, emissions and who benefits
• Costs and emissions both minimized with right incentives
Resources from RAP

- Environmentally Beneficial Electrification: The Dawn of Emissions Efficiency (Electricity Journal)
- Ensuring Electrification in the Public Interest
- Beneficial Electrification of Space Heating
- Beneficial Electrification of Water Heating
- Smart Rate Design for a Smart Future
- Capturing more value from PV and Other Distributed Resource
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
You have the Power

- Program design
- Program evaluation
- Ensuring environmental impacts are valued along with cost
- Cross-agency collaboration to achieve goals
Value of Flexibility for Integrating Renewable Energy

Avoid Home Charging during these hours

Source: California ISO
Level 2 EV Charging is a Lot Like…
An Electric Water Heater!
Really!

**Electric Vehicle**
- 3.3 – 6.6 kW
- 2,000 – 4,000 kWh/year
- Can avoid morning and early evening peak charging
- Batteries likely equal a full day’s supply

**Water Heater**
- 4.4 – 5.5 kW
- 2,000 – 4,000 kWh/year
- Can avoid morning and early evening peak charging
- Tank usually covers a full day’s supply