

Beneficial Load Growth Through Electrification



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Emerging Priorities

- Decarbonization
 - Cost-effectiveness
 - Equity
 - Grid value
- **Energy Efficiency** continues to be a critical resource.
 - **Non-traditional Programs** are increasingly important (e.g. DR, DER, NWAs, targeting).
 - **Beneficial Electrification** fills a gap by providing manageable new electric load and reducing fossil fuel consumption.

Gold, R., Gilleo, A., & Berg, W. (2019). *Next-Generation Energy Efficiency Resource Standards* (Report U1905). ACEEE.
Retrieved from: <https://aceee.org/sites/default/files/publications/researchreports/u1905.pdf>

Beneficial Electrification Program Impacts

Decarbonization:

Reduces greenhouse gas emissions
Decreases reliance on fossil fuels

Cost-effectiveness:

Increases sales growth
Reduces costs for customers

Equity:

Reduces site emissions of criteria pollutants
Puts downward pressure on rates

Grid value:

Improves grid utilization
New source of manageable load

Case Study: C&I Non-road Electrification

Program Objectives

Revenue Growth

Improve System Load Factor

Increase Satisfaction Scores

Program Description

Rebates for Forklifts and other Non-road Transportation Equipment

Custom Incentives for Large Industrial Equipment

Fleet Electrification Consultation Service

Electric Forklift



Scissor Lifts



Boom Lifts



Personnel/Burden Carriers

Case Study: Program and System Impacts

Program Results

600 Projects

4,200 Measures

325 C&I Customers Engaged

\$91,000 Average Customer Fuel Cost Savings/Year

65,000 MT/year Avoided GHG (13,000 Cars)

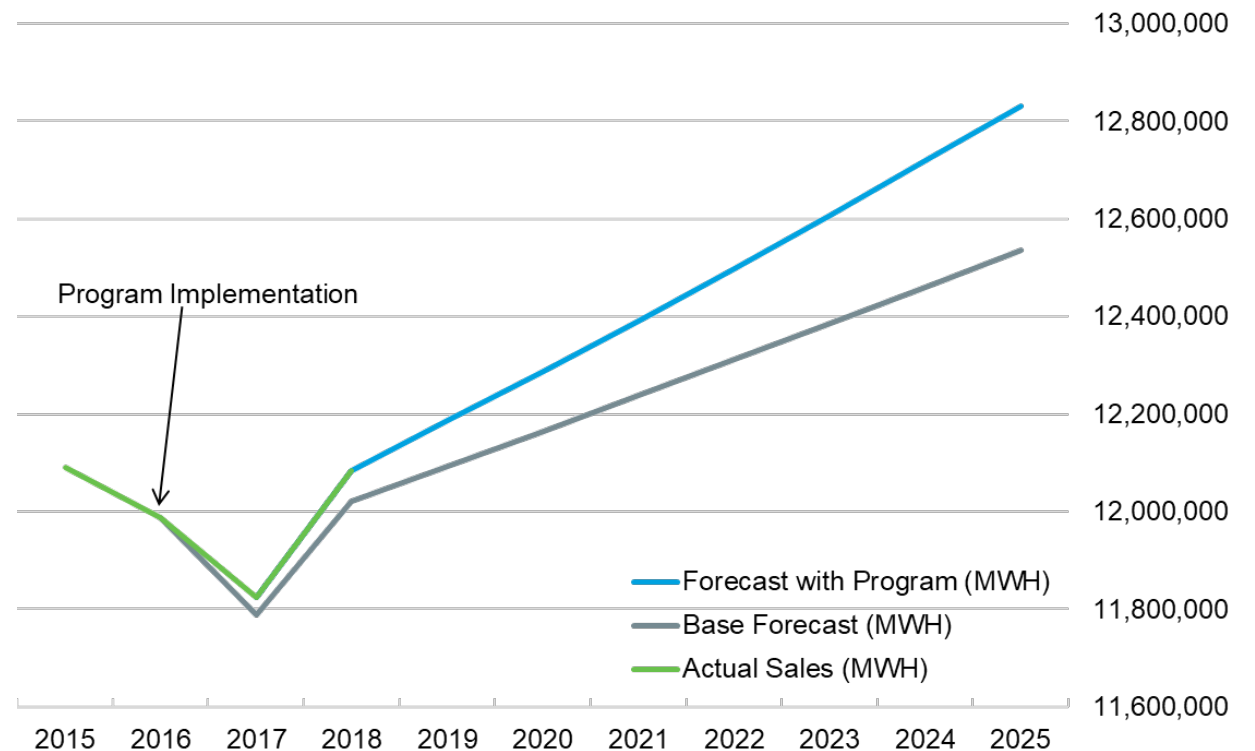
System Impacts

Load Growth: >0.25% per year

+0.26% Improvement in Load Factor

+1% Improvement in LF with Load Management

Impact of Beneficial Electrification for Sample Program
Annual Sales (MWH)








The Beneficial Electrification Toolkit








Technologies

 Non-Road & Material Handling	 Manufacturing
 On-Road, Light-Duty	 Infrastructure (Ports/Airports)
 On-Road, MD & HD	 HVAC
 On-Road, Buses	 Water Heating
 Food Preparation	 Recreational
 Custom	 Trains

Locations

 Home
 Multi-family
 Workplace or Destination
 In-route
 Fleets

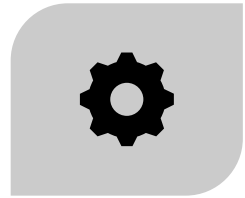
Strategies

 Infrastructure Deployment
 Rate Design
 Education & Outreach
 Incentives & Financing
 Partnership Planning
 Managed Charging
 Active Load Management (DR, V2G)

Program Design Considerations

- Capabilities and limitations of electric solutions
- Lack of awareness of new technologies
- Hybrid-fueled solutions
- Control strategies for battery powered equipment
- National Account strategies
- Dealer and contractor education
- Funding opportunities (VW, DERA, etc.)
- Competitive fuels
- Defining cost effectiveness

Systemic Barriers to Electrification



DECOUPLING
MECHANISMS



COST RECOVERY



PROHIBITIONS ON
LOAD BUILDING
ACTIVITIES



RESOURCE-SPECIFIC
ENERGY EFFICIENCY
GOALS



FUEL SWITCHING
RESTRICTIONS

Addressing the Barriers

California

- Modifying 3-prong rule for **fuel substitution** measures
- Authorized \$750M in funding for **clean transportation** outside of energy efficiency portfolio

Massachusetts

- **All fuels** MMBtu target recognizes all fuel savings including propane and fuel oil
- Tracking electrification efforts such as **cold climate heat pump** installations

New York

- **Fuel neutral goal** of 185 TBtu by 2025
- 5 TBtu carve-out for savings through **heat pump** deployment

Minnesota

- **Legislation** to reverse fuel-switching prohibition introduced in 2019 with no action
- Department of Commerce pursuing a **statewide electrification plan**



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