



# electrification

# ENABLING TECHNOLOGY



Our role as a utility is to enable that adoption of new technologies, whether it's the customer's technology or the technologies that we're deploying on the grid itself.

- David Trechler, Oncor Energy



Electrification requires consumers to purchase an electric technology to replace something that has been or would be powered by fossil fuels. Each sector of the economy has promising technology that is at various stages of market readiness and adoption.

## Examples of Enabling Technology by Sector



### TRANSPORTATION

- Electric Passenger Vehicles and Light-Duty Vehicles
- Commercial Fleets
- Electric Buses and School Buses
- Rail Systems
- Electric Aircrafts and Ground Support Equipment



### BUILDINGS

- Electric Heat Pumps
- Electric Water Heater
- Electric Induction Cooktops
- Electric Clothes Dryers



### INDUSTRY

- Electric Forklifts
- Electric Rock Crusher
- Electric Infrared Heaters
- Electric Induction Furnace
- Heat Pumps
- Boilers
- Petrochemical Cracking Furnaces



### AGRICULTURE

- Electric Tractors
- Electric Agriculture Pumps
- Agricultural Sprayers
- Water Heaters
- Radio Frequency Grain Dryers
- Radiant Heaters



At the end of the day in this country, you have free choice. And, for the most part, people have to pick [an electric technology over non-electric technology] because there's a benefit to them.

- Keith Dennis, Vice President, NRECA



## Advantages and Challenges

Each technology has specific benefits that go beyond decarbonization, and all have their own challenges. Some of the key advantages and challenges for the adoption of electric technology include:

### + + + + + ADVANTAGES + + + + +

- Advanced features can lead to better work performance.
- Higher overall energy efficiency and decreased maintenance costs lead to lower lifetime total costs.
- Ability to schedule charging off-peak to take advantage of lower rates for consumers.
- Off-peak scheduling can reduce system demand during peak load times.
- Support energy resiliency by utilizing stationary batteries for backup power.
- Better indoor air quality.

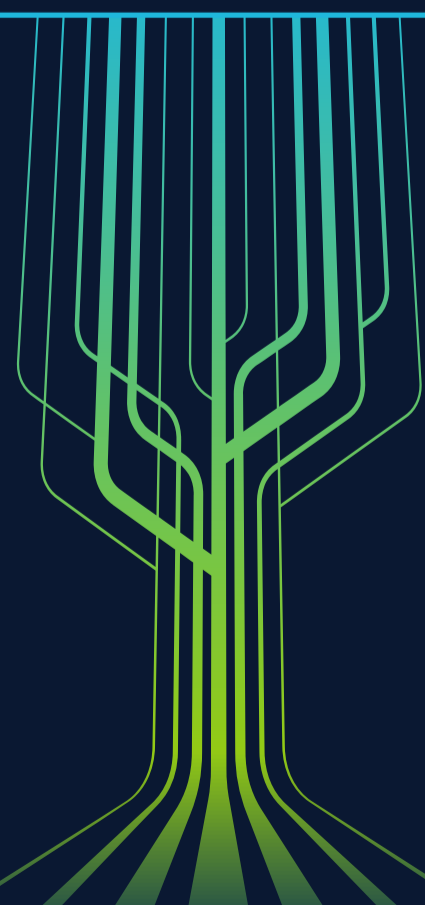
### - - - - - CHALLENGES - - - - -

- High upfront costs for both residents and businesses.
- Electrical upgrades needed to support the technology may increase costs and may not always be feasible.
- Lack of familiarity with the technology and its benefits.
- Lack of trained technicians to install and service the new equipment.
- Some consumers will choose to wait for the technology and markets to mature.

## Overcoming Barriers to Adoption

Utilities, vendors, municipalities, and states are working together to overcome some of these barriers. Some of these strategies include:

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**Customer Education**  
 Familiarizing customers with electrification technology and helping them understand the long-term vision is key to widespread adoption of the technology.
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**Vendor Partnerships**  
 Providing education and training to technicians so that they can install and service electrification technologies.
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**Financial Incentives**  
 Grants and rebates that may be available from state and federal sources can help customers overcome the high upfront cost of some electrification technologies.
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**Updating Building Codes & Regulations**  
 Banning natural gas hookups in new construction and requiring new homes to be prewired for future electric appliances and solar panels.
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**Filling Market Gaps**  
 Offering programs and incentives to help create a market for the technology.



FOR MORE INFORMATION ON ELECTRIFICATION GO TO [SMARTGRID.GOV/ELECTRIFICATION](https://www.smartgrid.gov/electrification).

