

In Development

## Customer Energy Savings and Societal Benefits Through Electrification

By Chris Warren

An EPRI effort with 29 electric utilities is pursuing cost savings and enhanced productivity for utility customers through electrification while also providing social benefits such as reduced carbon emissions and improved air quality.

For three years, EPRI and the utilities have identified fossil-fueled technologies that customers could profitably replace with electric alternatives. Prominent examples include forklifts, industrial processes, and airport ground support vehicles. The focus is on technologies that recover investment cost in three years or less.

### Strategic, Collaborative Approach

EPRI Senior Program Manager Allen Dennis and his team have identified approximately 460,000 gigawatt-hours of electrification opportunities for the participating utilities over the 30-year lives of the installed equipment. 460,000 gigawatt-hours is about 12.5% of U.S. end-use electricity consumption in 2013 (based on data from the U.S. Energy Information Administration's *Annual Energy Outlook 2015*). Because promising technologies and target customer groups will vary by utility, EPRI staff provides customized assessments for each company. EPRI and the utilities meet regularly to develop electrification strategies.

"If you find something with a short payback that the customer can adopt, you improve his bottom line," said Dennis.

Using EPRI's electrification database, the utilities and their customers can compare costs of common fuel-powered technologies with electric alternatives. "This enables our customer payback analysis," said Dennis. "For example, if a new electric forklift costs \$15,000 more than the fossil-fueled version, I have to generate \$5,000 a year in savings for a three-year payback."

They also examine market potential for specific technologies. "If 95% of forklifts in a certain market are already converted to electric, then I'm just spinning my wheels," said Dennis.

### From Idea to Implementation

The analysis yields a utility case study that details the three most beneficial electrification technologies and their target customers. In two instances, utilities asked EPRI to work with their customers to develop plans to electrify certain industrial equipment. EPRI also is helping utilities develop customer programs and incentives to encourage electrification.

"We support members in many aspects of electrification, from figuring out target technologies to developing programs to implementing technologies," said Dennis. "When we find a good opportunity for energy cost savings, our goal is converting the target technology to electric."

### Carbon Reduction and Other Societal Benefits

While the program is aimed at helping utility customers, electrification is also a key element of EPRI's research on carbon reduction strategies. Decarbonizing electricity and then using it to enable greenhouse gas emissions reductions in other sectors is one of the most efficient pathways to a low-carbon economy.

Electrification serves the public interest in several other ways:

- Reduces exposure to exhaust
- Improves worker safety by eliminating open flames associated with fuel-based processes
- Provides enhanced fuel diversity and energy security
- Offers more controllability, precision, versatility, and efficiency compared to fossil-fueled alternatives in many situations

“If an electric technology is good for a customer, it’s good for the utility and good for society,” said Mark Duvall, director of electric transportation at EPRI.

### **Key EPRI Technical Experts**

Allen Dennis, Sara Mullen-Trento, Baskar Vairamohan, Brandon Johnson