



How Electrification Can Benefit Low-Income Consumers

By Keith Dennis, Senior Director for Strategic Initiatives at the National Rural Electric Cooperative Association

By displacing direct combustion of fossil fuels, increased electrification of vehicles, space and water heating, and other end uses can significantly reduce greenhouse gas emissions. But what does this “beneficial electrification” mean for low- and mid-income consumers who cannot afford to pay more for energy?

For several decades, a major focus of energy policy has been to help low-income consumers reduce their utility bills through energy efficiency and conservation. Because these consumers use less energy than their higher income counterparts, it can be relatively difficult and expensive to provide them with significant savings through conservation. At the same time, low-income consumers spend a higher proportion of their income on energy, so any savings can greatly impact their quality of life.

Enter beneficial electrification, which opens new savings opportunities for consumers of all incomes through more efficient use of energy. With emerging realities such as excess renewable energy, low- and negatively priced wholesale electricity, and a growing need for flexible loads, utilities have more

opportunities to provide savings to consumers by focusing on *when and how* they use energy rather than *how much*.

Increasingly, consumers can provide value to utilities by using electricity when it is best for the grid to help balance supply and demand. This

value can be returned to consumers in several ways: traditional rate design (such as time-of-use rates), programs that help pay upfront costs of flexible loads (such as rebates on new or used electric vehicles or new water heaters), and pricing based on the value provided by customers’ energy use. For example, if the benefits of a grid-interactive electric water heater with a 10-year life are \$100 annually, a



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rebate of several hundred dollars could be available to the consumer. These savings are becoming easier to measure and reimburse with more communications technology and smart metering.

Consider electric vehicles. Utilities across the country are beginning to offer programs and incentives that make electric vehicles a more realistic option for mid- and low-income consumers. In addition to upfront incentives and low-interest financing, many utilities offer off-peak rates that enable dramatic savings for electric vehicle owners. For example, with “super” off-peak rates of 2.7 cents per kilowatt-hour from 10 pm to 5 am, customers of Piedmont Electric Cooperative in North Carolina pay \$129 to charge an electric vehicle to drive 13,500 miles per year. Compare that with annual costs of nearly \$1,200 to fuel a similar model with gasoline. Electric vehicle owners also avoid costs for oil changes, tune-ups, spark plug replacements, and emission tests.

Given current vehicle prices, it may seem like a stretch to think of electric vehicles as a savings opportunity for low- or mid-income consumers. But incentives can bring them within reach to more people. Members of New Hampshire Electric Cooperative who purchase the all-electric 2018 Nissan LEAF can receive a \$5,000 rebate or a 0% annual percentage rate (APR) for 72 months, along with the \$7,500 federal tax credit.

We need to update the cost tests that are used to demonstrate to regulators that such programs should be eligible for ratepayer, government, or other public benefit funds. These tests measure whether the amount of energy conserved is cost-effective relative to traditional generation options. They were not designed to determine the value of using electricity instead of fossil fuels during low demand or periods when renewable energy would otherwise be curtailed or negatively priced.

With the dramatic growth of renewable energy, many power industry stakeholders initially pondered the question, “What do we do when the wind isn’t blowing and the sun isn’t shining?” The more relevant question emerging is, “What do we do when the wind *is* blowing and the sun *is* shining and there is low demand?” The answer: Use that energy right away by putting it in a water heater, car, battery, or scooter while it is cheap.

These and similar questions make it imperative to unlock the value of beneficial electrification for consumers of all income levels.

In addition to his role at the National Rural Electric Cooperative Association, Keith Dennis is on the advisory board of the [Beneficial Electrification League](#), a new nonprofit organization focused on promoting market acceptance for beneficial electrification concepts, policies, practices, technologies, and business models.