Transforming utility customer service: Rates, incentives and decarbonization



In the absence of federal mandates, many states throughout the country are beginning to set their own greenhouse gas (GHG) emission limits. In order for states to meet these limits, significant GHG reductions from both the commercial & industrial and residential sector are necessary. This series of articles will examine how technology intersects with supporting policies to drive residential sector decarbonization. In addition to developing and advancing new technologies, it is critical to have corresponding policies that support the adoption of those technologies.

This article, the third in the series, focuses on the role of rates and incentives as powerful tools that can be used to help shape customer behavior towards certain technologies and reduce GHG emissions.

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Transforming utility customer service: Residential heat pumps can help decarbonization efforts
Transforming utility customer service: Helping decarbonize the residential sector

Financial signals can be influential levers to encourage customers to adopt desired behaviors. While a financial signal can be communicated through rebates, incentives, or rates, the important part is that the signal is clear. If the public policy objective is to reduce GHG

emissions from residential customers, rates and incentives need to be designed to meet those goals. For example, rate structures or incentives that encourage electricity usage during off-peak times can help lower GHG emissions by negating the need to run inefficient generation, which is typically run during peak demand periods.

There are several ways a utility could use financial signals to encourage this behavior. A utility could provide rebates to install efficient equipment that reduces consumption during peak demand time periods, or it could introduce less expensive off-peak Time of Use (TOU) rates to encourage customers to use electricity at times when the GHG intensity of generation is relatively low, or some combination of both.

Two prime examples of utility rate programs that encourage the adoption of new technology that helps reduce residential GHG emissions are Green Mountain Power's Rate 72 Residential Off Peak Electric Vehicle Service and United Power's RTD1 Time of Day rate for Electric Thermal Storage. For Green Mountain Power (GMP) customers that have approved level 2 electrical vehicle chargers, GMP offers an off-peak EV charging rate of $0.133/kWh. Off-peak is defined as any time that the utility is not calling an EV demand response type of event. These EV demand response events could be called when there are distribution level issues or when there are GHG emission or financial reasons to do so. Customers are not prohibited from charging during an event but if they do, the rate jumps up to $0.686/kWh. This large difference in rate sends a clear signal to customers to charge their vehicles during off-peak time periods.

Energy storage is another emerging technology that could help lower GHG emissions by shifting consumption away from times of peak demand and high emissions. In the residential context, storage is commonly thought of as lithium-ion batteries coupled with solar. But United Power has an innovative rebate and rate program targeted at increasing adoption of electric thermal storage which uses ceramic bricks to store and release heat. United Power customers that install Electric Thermal Storage and enroll in the Time-of-Day rate are eligible for a rebate on the Electric Thermal Storage device itself and are then also able to take advantage of off-peak rates to charge their thermal storage at $0.0525/kWh vs. on-peak rates of $0.154/kWh. Similar to Green Mountain Power, this difference in on-peak vs. off-peak rate is meant to send a clear signal to customers to adopt new technologies and utilize them in a way that can help push demand out of peak time periods.

It is important to note that financial signals to customers do not solely need to take the form of rates. For utilities that do not have widespread deployment of Advanced Metering Infrastructure (AMI) and the backend billing and meter data management systems to support multi-part TOU rates, rebates and incentives remain a powerful tool to shape customer behavior towards decarbonization. In Massachusetts, where there is not currently AMI deployment, the electric utilities have developed incentive-based programs to promote decarbonization. Substantial rebates are meant to drive customers towards installing heat pumps and other highly efficient technologies. Demand response programs for thermostats and electric vehicles provide incentives for allowing the utility to dispatch the customer's assets to lower load during times of high demand and rely on data directly from the devices to let the utility know if the customer participates in a demand response event. These financial

signals encourage customers to adopt more efficient technologies and participate in demand response programs, allowing the utility to lower demand during times of high GHG emissions.

In order to successfully promote GHG reducing technologies and strategies to residential customers it is critical to enact complementary policies to support those technologies. Financial signals like rate structures and incentives are useful tools to not only communicate to customers desired behaviors that will help in decarbonization efforts, but also motivate them to act. And we need every available tool as we collectively seek to reduce GHG emissions.

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