The smart consumer's guide

to utility incentive programs

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Simple, intuitive solutions
for home automation, connectivity and energy management.

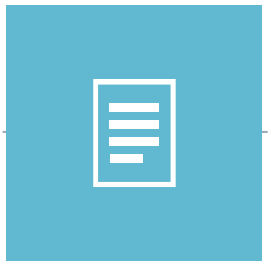
Summary

What if you could lower your monthly electric bill simply by rolling back your thermostat two degrees? Or increase confidence that your air conditioner and other appliances will power on as expected even during scorching summer temperatures — rather than overtaxing the electrical grid and sparking power outages that can leave you in the dark (and heat)?

In an effort to bolster reliability and lower costs for consumers, a growing number of utility companies have been rolling out the welcome mat to residential incentive programs. Aimed at alleviating the burden of electricity demand outpacing supply, these programs offer an alternative to utilities having to construct expensive new power plants, while simultaneously helping them increase the use of renewables with the ability to control some loads. By encouraging homeowners to change their behaviors and reduce consumption during peak periods, participants are rewarded with various forms of financial incentives, as well as provided with an opportunity to play a significant role in grid operation by reducing or shifting their electricity use. Perhaps most importantly, the measures are a welcome step toward increasing the likelihood of being able to enjoy the comfort of your HVAC system, water heaters and other appliances without interruption.

Intrigued by the advantages of utility incentives? Here are seven things to consider about these programs:

1. Different utility companies offer different incentives
2. Determine which type of program is right for you
3. Weigh the program's benefits
4. Consider how smart home devices can aid utility programs
5. Read the fine print
6. Look ahead
7. Take the next step



Different utility companies offer different incentives.

While the majority of utilities provide some form of incentive program, the specifications can vary greatly depending on the type of electric system operator. For example, cooperatives, municipals, investor-owned and retail energy operators may all extend distinct options. Demand response (DR) and energy efficiency (EE) programs are being used by some utilities as a resource to balance supply and demand.

Such programs help to lower the cost of electricity in wholesale markets, which in turn can prevent increases in retail rates. These programs include time-based rates or direct load control programs, which provide the ability for power companies to cycle appliances such as air conditioners and control water heaters during periods of peak demand or during times of transmission or distribution system congestion in exchange for a financial incentive. Some utilities also provide a one-time sign-up incentive.

Determine which type of program is right for you.

In general, there are three primary types of incentive programs offered by electric providers. Keep in mind that the specifications and requirements of each program can vary widely depending on the individual company.

Demand response

DR programs encourage homeowners to conserve energy usage during high-demand times, which helps to reduce the strain on the grid. During periods when electricity requirements threaten to exceed the supply — such as extreme temperatures, renewable intermittency, scheduled maintenance and unexpected power line damage — utility companies rely on demand response to help restore balance through incentives such as rate reductions and bill credits. By minimizing peak load consumption while empowering households to manage their usage and lower monthly costs, demand response also aids planning, costs and efficiency goals. These programs also have the potential to help providers save money through reductions in peak demand and, as mentioned, to maximize use of renewables while deferring construction of conventional power plants and additional transmission and distribution power lines.

Time-based rates

Time-based rate plans charge consumers varying electricity prices depending on the time of day, season or day type (such as weekday, weekend or holiday). The goal of this structure is to shift energy use from peak hours to off-peak times, which in turn aligns consumer costs with the actual cost of producing electricity. Higher rates are charged during the peak demand hours and lower rates during off-peak hours. Most utilities update their residential electricity rates once or twice a year, with fees generally higher in summer months than in winter. Advanced metering infrastructure has helped to expand the range of programs available to consumers. Options include:

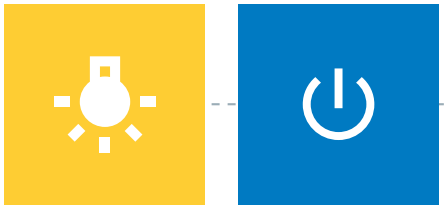
Time-of-Use (TOU) — This type of pricing adjustment applies to energy use over a set span of "off-peak" hours, in which the price for each period is pre-determined. TOU prices are most often seasonal.

Real-Time Pricing (RTP) — With this program, electricity rates apply to usage on an hour-by-hour basis.

Variable Peak Pricing (VPP) — This option combines both the TOU and RTP methods, with the utility issuing different electrical rates based on defined time periods.

Critical Peak Pricing (CPP) — This option sees electricity prices significantly raised when utilities observe or anticipate high wholesale market prices or power system emergency conditions.

Sometimes called conservation events or peak events, during these designated hours, customers are asked in advance to be mindful of their energy consumption. One midwestern utility, for example, connects to customers' smart thermostats to pre-cool homes and lower energy usage during peak periods. In most cases, customers opt in to this type of program and are notified via email prior to an event. In some utilities all customers are on a time-based rate by default.



Energy efficiency

Many of the energy efficiency programs available to homeowners are sponsored by utility companies with the goal of helping residents reduce overall consumption and lower utility bills. While an operator encouraging its customers to use less energy and reduce monthly bills may seem counterintuitive, energy efficiency measures benefit utilities as well as residents. Efficiency represents the least expensive way to source new electricity, with many states requiring utility companies to invest in it. On average, the energy saving gains from these programs represent one-third of the cost of adding new energy generation resources, according to the American Council for an Energy-Efficient Economy (ACEEE). This type of program can also help utilities improve service reliability by better managing times of high demand. Considering the fact that just five grids are responsible for serving all of North America, it's not surprising that sudden spikes in energy demand can yield drastic consequences. While it may seem difficult to believe, the difference of just a couple of degrees in each home can represent the difference between a stable power supply and disrupting an entire regional grid.

Some utility companies provide energy auditors to work with homeowners to help them reduce energy usage and costs. Others have begun to extend critical peak rebates to residential customers. Originally reserved for commercial entities, this type of incentive grants discounts to residents who use less electricity when the grid is most taxed.

Weigh the program's benefits.

Participating in a utility incentive program generally doesn't require a major commitment or effort — and the benefits should far outweigh any potential drawbacks. Programs are designed to avoid causing discomfort to participants. For example, residents are unlikely to notice if the utility raises a home's temperature by a degree or two over a four-hour period to prevent the A/C from cycling on. Similarly, a provider might turn off the water heater for a period of hours with no ill effect on the consumer, as a sufficient supply of hot water will remain in the tank. During record-breaking polar vortex events that have occurred in recent years, some utility companies asked customers to lower their thermostats to avoid straining the power network.

Incentive programs provide financial benefits to homeowners, as they naturally reduce overall electricity demand. Not only can residents save money simply by consuming less energy during certain peak hours, they can also earn financial incentives that apply to future energy costs. Furthermore, in some cases, reducing electric consumption during peak demand can result in lower wholesale prices, as it cuts the need for costly, inefficient forms of electricity generation while maximizing the benefits of renewable energy. This, in turn, helps regulate energy costs, which means more money back in your pocket.

In addition to financial benefits, incentive programs enable residents to aid grid reliability efforts; by helping to remove extra stress from utility systems, it makes them less likely to fail. Many homeowners also value the programs' ability to make them environmentally conscious consumers.

EV drivers can charge up the savings

Electric vehicle (EV) drivers are particularly inclined to engage TOU rate structures, with utilities rewarding EV owners who charge at designated times. While exact savings on operating costs will vary depending on the charging application and other factors, significant savings can result from participating in DR programs and scheduling charging to occur during off-peak hours when electricity is at its cheapest. For example, charging an 8 kilowatt/hour sized battery during off-peak periods can save up to $400 annually. Other estimates suggest that by avoiding the most expensive times to charge their EV, homeowners can save up to three times the amount while still receiving the charge needed. Furthermore, dozens of utilities offer rebates on the purchase of a smart home charger, with amounts ranging from about $150 to $750 per charger. Another effective way to cut costs is to enroll in any energy-saving programs offered by both utility companies and city governments. To promote cleaner energy, these types of organizations will sometimes provide lower power rates to households with electric vehicles.

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Consider how smart home devices can aid utility programs.

As smart home technology continues to flourish, it is opening the door to new and innovative ways for electric companies to deliver incentive programs. Over the past decade, a number of technologies have been introduced to help residents engage in their energy use, including smart meters, rooftop solar panels, electric vehicles, home battery storage and smart thermostats. When first introduced, traditional demand response programs involved utilities installing control devices on customers' larger, energy-gobbling loads — most notably central air conditioners and water heaters — which enabled the utility to control them as needed. But the emergence of smart receptacles is now making it possible to manage smaller loads, as well.

Smart home technology enables residents to optimize and automate their household energy use based on utility prices. For example, systems can monitor solar generation and household electricity consumption, communicate with the cloud and control appliances using algorithms to respond to signals. Smart home energy systems automate these shifts for convenience and cost savings, maximizing customer savings while also encouraging more favorable consumption during peak events.

Many customers achieve the most value by automating systems; for instance, setting the thermostat or configuring the water heater so they do not operate during high-price periods. It is important to note that only devices that have been enrolled by customers can be controlled by the utility. Furthermore, customers always maintain the ability to easily override the control if they need to for some reason. Smart customer systems such as in-home displays or home area networks can make it easier for consumers to change their behavior and reduce peak period consumption based on information on their power consumption and costs.

Smart devices often fit into a BYOD (bring your own device) program model. For example, if a customer purchases and installs a smart receptacle, they may be able to enroll the device in the program, providing the utility access to control it.

Read the fine print.

If properly executed and maintained, utility incentive programs should be easy for participating consumers. However, it is nonetheless important to carefully read any contract and understand all of the details before engaging in a program.

They say everything is bigger in Texas — even the utility bills?

Variable-rate utility plans came under the microscope in Texas in February 2021, when an unprecedented polar vortex caused a statewide electrical grid failure. Many residents with variable-rate power plans paid an even greater price, receiving enormous bills for the electricity they used during the storm.

That is because these plans charge different prices for electricity depending on the wholesale power cost. As the supply decreased and demand increased, customers were exposed to the higher rates. Although the U.S. Energy Information Administration cites the average price for electricity in Texas during the winter at about 12 cents per kilowatt-hour, Texas utility regulators allowed that price to rise to $9.00 per kilowatt-hour during the storm.

This outcome was unique to Texas due to the state's unregulated market. In most cases, customers aren't exposed to wholesale market rates in this manner. However, because every utility works differently, it is important to understand the fine details before entering into any agreement.

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Look ahead.

As the market changes and technology continues to advance, you can expect that utilities will increase efforts to work with customers to conserve energy. Utilities are very interested in helping consumers increase efficiency and become a more ecologically aware partner. Expect to see the use of more distributed energy resources (DER) such as battery storage to increase resiliency, reduce costs and support grid stability.

TOU rates are fast becoming the new standard in states like California, where utilities are implementing default time-varying rates as part of opt-out recruitment strategies. Recent studies in the state are exploring how TOU rate plans can offer customers additional cost savings when partnered with emerging smart home energy technologies.

In addition, as utilities transition some of their loads from fossil fuel to renewable energy sources, expect to see EE and DR programs that reflect these changes. For instance, while many existing water heaters are gas-powered, new regulation in some states such as California requires new water heaters to have electric heat pumps that are compatible with utility incentive programs. While energy efficiency is an important issue, there will be critical environmental benefits as renewables become a bigger share of the electrical generation supply.

By participating in EE and DR programs available for switched end use, customers can maximize the benefits of shifting from fossil fuel to renewable electricity, including being more environmentally responsible. This, in turn, will drive utility companies to provide incentives to encourage the customer's electrical load to match renewable generation.

Take the next step.

Homeowners who are interested in learning more about utility incentives should check with their utility about different programs. In most cases, operators will have a sign-up process on their website.

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About Eaton

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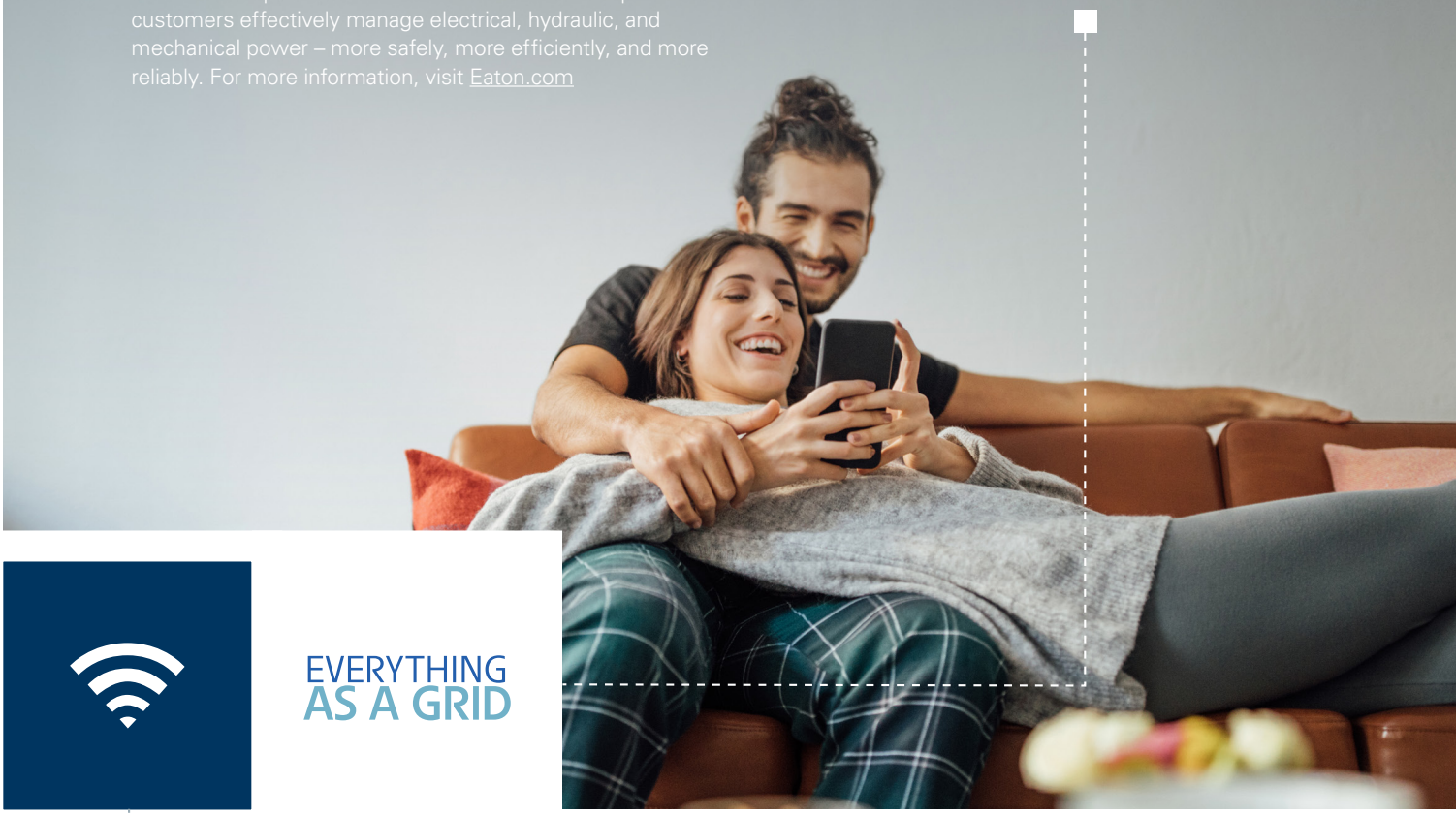

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