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Time-variant electricity pricing can save money and cut pollution

Throughout most of the country, residential customers pay the same price for electricity regardless of the season or time of day when it is used. Also known as "flat rates," these prices mask the true system costs of producing and delivering electricity, which vary by time and location according to electricity demand. Charging customers a uniform price for electricity is like a supermarket charging customers by the cartful instead of by the cart's contents. Prices that better reflect the time-varying costs of electricity can lead to a number of economic, health and environmental gains, such as reduced energy bills, lower carbon emissions, and increased investment in on-site, distributed energy resources like energy efficiency, storage and renewable energy sources.

Why is time-variant pricing important?

Since they can use electricity when it is cheaper and cut back when it is more expensive, time-variant pricing (TVP) gives customers greater control over their energy use and electricity bills. For example, most customers participating in New Jersey-based PSE&G's TVP pilot program saved more than $150 per year. TVP can also help utilities defer or avoid investments in energy infrastructure, such as polluting power plants and transmission lines, built to meet increasing electricity demand. For instance, Oklahoma Gas & Electric found that if 20 percent of customers adopted a time-variant rate, they could avoid building a 210-megawatt power plant. Finally, TVP can help reduce greenhouse gas emissions by incentivizing conservation and investments in clean, distributed energy resources, as well as shifting demand to times when electricity is generated by cleaner sources.

Several pilots across the country have shown that TVP can substantially reduce electricity use throughout the day and during times when the grid is stressed. This is particularly true with critical peak pricing, as electricity use has been shown to fall by nine percent to as much as 47 percent during unusual, or "critical," events, such as heat waves or power plant failures.

What are the different types of time-variant pricing?

Allowing prices to reflect electricity costs that vary over time can be done in many different ways. Commonly implemented types of time-variant pricing include:

Real-time pricing (RTP): Prices vary frequently over the course of the day to reflect fluctuating electricity costs.

Time-of-use pricing (TOU): The day is broken out into two or three periods of time (e.g., peak period, off-peak period, interim period) whereby prices vary by period, but remain consistent from day to day.

Variable peak pricing (VPP): Similar to TOU pricing, except that peak period prices change daily to reflect system conditions and costs.

Critical peak pricing (CPP): A critical event is identified when the price may increase dramatically to reflect system conditions.

Critical peak rebate (CPR): Similar to CPP, except that customers are paid for cutting back on electricity during critical events relative to the amount they normally use.

What would make time-variant pricing more effective?

Advanced metering technology. Time-variant pricing requires the installation of advanced, or "smart," meters that measure electricity use for the periods determined by the TVP option used. For example, TOU requires measuring use for two or three different intervals daily, while other TVP options require meters to measure use for each hour of the month.

Meter data. Introducing time-variant pricing on a large scale requires investment in an advanced system that can collect, store, manage and integrate the large amount of data TVP metering generates.

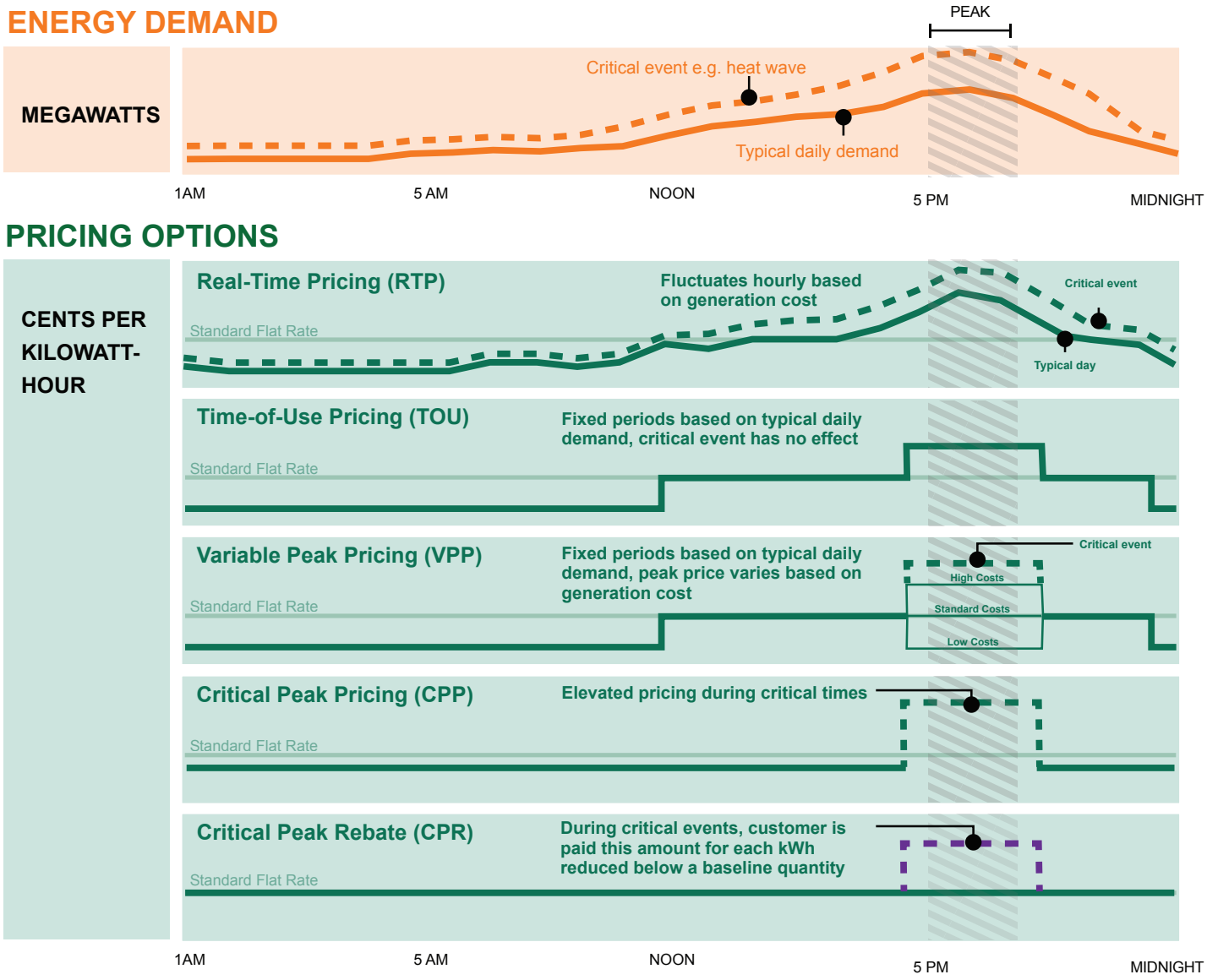
Operations. TVP programs may require operational support such as project management, call center operations, customer notifications and other ongoing administrative costs.

Electricity price design. The type of TVP a utility chooses to offer and how that option is designed will depend on the needs and requirements the utility is aiming to address. Maximizing effectiveness and customer acceptance are further considerations that play into designing prices.

Opt-in vs opt-out. Choice structure can also affect TVP adoption rates. Asking residential customers to *opt in* to time-variant pricing—rather than setting it as a default from which customers can *opt out*—has historically led to low adoption. Opt-out TVP programs lead to a much larger reduction in electricity use because many more customers enroll in the program.

Customer education and awareness. Educating customers on how they can modify their behavior to benefit from TVP is integral to rolling out a successful program.

Flexibility and evaluation. Conducting analyses of existing programs is an essential tool to understand how customers respond to new TVP options and evaluate the need to change or modify the way prices are set.



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