# Reducing demand can lower electric bills, lessen chance of blackouts

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A 5-percent reduction in electricity use will lower the market price of electricity, cut consumers' bills and lessen strain on the grid when demand shoots up this summer, say energy experts in Penn State's College of Earth and Mineral Sciences.

Because electricity is almost universally used for cooling, demand for electric power soars during summer months, and utilities must bring into service reserve generators or "peakers" to meet consumers' demand. But while these peakers can be dispatched quickly to provide needed electricity, they do not operate very efficiently.

"The electricity produced during peaks in demand is far more expensive than the electricity generated from the coal-fired plants and nuclear power plants which operate around the clock," said Seth Blumsack, an assistant professor of energy policy, College of Earth and Mineral Sciences. "It is important to realize that using 5 percent less electricity does not mean that people need to be sitting around in the dark. Most folks can easily reduce their energy bills without major sacrifices in lifestyle."

As energy prices keep rising, even small reductions in demand can lower electric bills. In Pennsylvania, which is moving toward market-based electricity pricing, demand reduction could offset some of the increases consumers will see when rate caps expire. In addition, reducing demand during peak times also lowers the risk of blackouts, Blumsack said.

A Pennsylvania study estimated that reducing demand by 5 percent relative to 2008 levels would save residential customers 1.5 cents per kilowatt-hour (kWh); commercial customers, 1.4 cents kWh; and industrial customers, 0.9 cents kWh, Blumsack said. In the absence of rate caps or freezes, rate payers in other states could see similar savings providing generation occurred through a similar mix of fuels as used in Pennsylvania.

Peakers are small plants that typically run on natural gas or diesel oil and produce between 5 and 50 megawatts (MW). For comparison, baseload plants produce upwards of 1,000 MW. A MW of electricity is equivalent to the electricity for between 800 and 1,000 homes, depending upon their size.

While the efficiency of cooling systems has improved, many residential consumers and small business owners continue to rely upon inefficient air conditioning systems. Their use on hot summer days can spike demand for electricity as much as 20 percent to 30 percent over winter peak demand. Because peakers are more expensive to operate, consumers end up with higher electricity bills.

Data for a 2005 summer day from the PJM system, which dispatches generating plants through the Mid-Atlantic and parts of the Midwest, indicated early-afternoon demand pushed the market price for electricity to three times its price just eight hours earlier.

Reducing the need for peak generation also has environmental benefits as many peakers have high emissions of greenhouse gases and other pollutants.

"Policies which support reducing demand by 5 percent are a cost-effective and needed first step in addressing rising electric rates, the nation's aging electric power infrastructure and accumulating carbon

dioxide emissions," said Amy Glasmeier, professor of geography and co-author with Blumsack of "Reducing Demand, Promoting Efficiency Key to Defusing Electric Rate Increases."

As part of their analysis, Blumsack and Glasmeier recommend policies which would result in a 5-percent reduction and which would provide incentives for the construction of new peaking generators. New peaking generation can be 30 percent more efficient than existing plants.

Source: Penn State