

Tapping big data to unlock clean energy solutions

Nearly half of all American homes are now outfitted with smart electricity meters, creating an unprecedented opportunity for data-driven energy savings.

Today's sensors and meters are producing enormous amounts of data that could help slash carbon pollution from the power grid, which accounts for more than a third of U.S. carbon emissions. Thanks to the efforts of Environmental Defense Fund (EDF), the Citizens Utility Board (CUB), and the Illinois Commerce Commission (ICC), researchers now have access to a treasure trove of anonymous energy-use data representing millions of people in Illinois. This data enables groundbreaking research to help save customers money, unlock energy-saving innovation, and answer policy questions vital to our pocketbooks and the planet.

Bold new energy data

New technologies are painting an unprecedented, detailed picture of how people use electricity. Nearly half¹ of all U.S. households are now outfitted with smart meters – and that number is growing every day.

The data from these smart meters can be used to guide sound policy, greatly expand the amount of clean energy on the electric grid, and slash carbon pollution while keeping electric bills low.

A variety of stakeholders can use the data to identify opportunities. For example, a rooftop solar company could find the neighborhoods and blocks with the greatest potential to save money through solar. By better understanding

how and when people use power, grid operators can determine where the grid is stressed and identify efficient and reliable strategies. Entrepreneurs can use data to detect unseen problems and offer customers new services and product solutions.

Progress in Illinois

Analysis of energy-use data can lead to a more efficient and resilient power system, but researchers and third parties first need access to the information. Fortunately, Illinois has unlocked this potential. In February 2017, the ICC approved the first-in-the-nation release of anonymous energy-use data on a large scale, representing 4 million individual customers in

“Illinois data reveals 97 percent of analyzed electricity customers would have saved money in 2016 through a real-time pricing program.

the state. The data is highly-granular, measuring electricity use by time and location: in half-hour increments, daily, over a series of years, and by local zip-codes.

The anonymous data is available for analysis, and universities and researchers – with expertise in both the electricity industry and data analytics – are eager to dive in. In fact, Massachusetts Institute of Technology, University of Illinois, and Tsinghua University, a research university in Beijing, have signed

agreements to work with EDF and CUB on this big energy data project. In addition to partnering with major academic institutions, EDF and CUB are now examining the Illinois information to advance marketplaces and policies that cut costs and climate pollution.

The promise of the smart grid has always been to empower people and make the electric grid more efficient, affordable, and reliable. By unleashing customer data, Illinois is blazing the pathway to this energy future.

Data in action



Real-time pricing

EDF and CUB wanted to see how the customers of Illinois’ largest electric utility, ComEd, would have fared under a “real-time pricing” program in which power prices change hourly.

Anonymous data from over 300,000 homes revealed several interesting tidbits summarized in *The Costs and Benefits of Real-Time Pricing*.² Most importantly, the study shows that real-time prices would have saved money for 97 percent of customers in 2016 – *even if the customers made no changes to how they use electricity*. Even greater savings, and reductions in pollution, are possible for those who choose to change their energy use.

Low-income energy use

Utilities often protect profits through fixed charges, recurring fees that all customers must pay regardless of how much electricity they use. Utilities claim that these charges won’t unfairly hit low-income customers by alleging, typically without supporting data, that low-income customers use as much power as others. But new data³ analyzed by EDF and CUB, and summarized in our *Big Energy Data Update*, shows that low-income households actually used significantly less electricity – nearly 16 percent less – on average in 2016. Higher fixed charges therefore likely hit economically-challenged communities hardest.

¹ 2017 U.S. EIA
² 2017 CUB, EDF
³ 2017 CUB, EDF

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