Teslad Electricity Storage Battery Could Cut Utility Revenue by Billions

By Arun Mani
Arun Mani is a Partner in Oliver Wyman’s Energy Practice, based in Houston
Tesla Motors’ new energy storage battery threatens to cut utility revenue by billions of dollars a year as commercial customers gain a tool that could undermine the way utilities make money.

Alarm bells should be going off for traditional utilities after the popular electric vehicle maker announced it would offer battery models for $3,000 or $3,500 that can store enough electricity to power a home or business for a few hours. This is not just about a few wealthy homeowners making better use of their solar panels. This is about a fundamental change to the way electricity is generated, sold, and used. This is about power plants potentially sitting idle, power lines moving less electricity, and commercial customers, big and small, gaining a powerful tool to cut their electricity bills.

Here’s why: In many cases, a commercial customer pays a significant fee, called a demand charge, based on the amount of electricity the customer draws from the grid during that customer’s time of peak usage. So, if a manufacturer, for example, runs all of its equipment, air conditioners, and lights, during the afternoon, that peak usage period determines the demand charge. That’s because utilities must keep extra power plant and power line capacity available on reserve to meet the potential surge in demand.

Demand charges can represent up to 80 percent of an average commercial customer’s monthly bill. Some utilities charge a flat fee, others charge based on the time of day and season of the year that the customer uses electricity, and other utilities have a tiered system, with higher demand fees for customers with higher usage. For many customers, reducing their peak consumption can cut the demand charge, even if the customers use the same amount of electricity. This is where battery storage could offer a compelling business case for a customer. Buy a Tesla Powerwall, or any of the variants available in the market, to switch to battery power during the peak usage hours, and considerably reduce, or even eliminate, demand charges.

**Figure 1: Demand charges as a percent of customers’ commercial bills, by utility rate plan**

Demand charges represent various portions of commercial bills, depending on how the utility structures the charges. For most US companies, demand charges represent up to 20 percent of the electricity bill. For some, that amount rises as high as 80 percent.

Consider California, a leader in progressive energy storage legislation. Demand charges for commercial customers in the state run in the billions of dollars. The average commercial customer’s annual bill across the nation is approximately $50,000. If just 10 percent of commercial customers in California install battery storage and use the technology to cut their
demand charges by one third, the state’s utilities could lose more than a billion dollars a year. If battery storage becomes more popular and more effective, the loss could balloon, just through lower demand charges.

**Figure 2: Average annual commercial utility bill** (Based on a selection of national utilities)

![Average annual commercial utility bill graph](http://energy.gov/sites/prod/files/2014/11/f19/46782.pdf, Oliver Wyman analysis)

Of course, regulators in every state are different. Some public utility commissions would allow utilities to recoup their costs by boosting demand charges for those customers who still pay them or by finding alternative recovery mechanisms. In that case, the utility’s shareholders would see a temporary dip in revenue, until rates could be adjusted to cover the total costs for a utility to manage peak demand.

Still, if battery storage helps commercial customers reduce peak usage for the long-term, utilities won’t need to keep so much power plant capacity in reserve for peak hours.

At the beginning of this year, before Tesla entered the market, 43 companies offered battery storage systems. Tesla, with its brand power and celebrity founder Elon Musk, draws enormous attention to the sector. This should be a wake-up call for utilities. As some utilities wrestle with regulators over whether to invest in utility-grade battery arrays and pass the cost along to customers, technology is allowing customers to make their own decisions and undermine the utility’s traditional rate-setting process.

Utilities do have advantages over the upstart technology companies. The old power-and-light companies possess financial and operational skills, and they’ve built relationships with their customers over the years. Now it’s time to draw on those broad attributes to create new services based on what utilities do best.

One example is Avista Utilities’ energy storage project in Pullman, Washington. The Spokane, Washington, utility has invested $3.8 million in a project that includes installing batteries at a manufacturing plant. The customer can use power from the batteries in case of an outage, and Avista can also draw from the batteries when needed. The shared investment keeps Avista in the role of traditional utility, investing in infrastructure, while pushing the company into the new role of energy partner.

Rather than resist new technology, this is an example of drawing on traditional utility characteristics: using long-standing customer relationships to understand power requirements and system operations, and integrating new technologies in a way that benefits both the customer and the utility.

*Arun Mani is a partner with the energy practice of global management consulting company Oliver Wyman. He is based in Houston.*