Driving growth with plug-in electric vehicles: Don't be left in the passenger seat.

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Plug-in electric vehicles (PEVs) are a significant opportunity for utilities to strengthen their position in the evolving energy ecosystem and create higher shareholder value.

The market for PEVs is charged up and ready to roll. Growth in market penetration of PEVs is occurring across major global markets.

Although the aggregate adoption of PEVs is just a few tenths of a percentage point today, Accenture Strategy forecasts adoption at 2 to 3 percent of total fleet by 2025. In leading markets, the industry could see adoption at 5 percent or even more1 (see Figure 1). Accenture Consulting New Energy Consumer research found that respondents ranked electric vehicles in the top-five most wanted products and services.2

Industry innovation is increasing demand, with compelling PEV models (in both price and styling) now available from nearly all auto manufacturers. When Tesla announced its Model 3 in March 2016, the company received nearly 400,000 pre-orders in the first month alone.3 Compare this to the roughly 1.3 million total PEVs sold across the globe to date.4

PEVs offer a significant opportunity for utilities to strengthen their position in the evolving energy ecosystem and create incremental shareholder value (see sidebar on page 3, PEVs driving value).

For example, a single PEV can increase electricity use of a typical household by 20 to 30 percent.5 Two passenger PEVs in a neighborhood can roughly offset one residential customer with distributed solar. And 300,000 PEVs can offset a million MWh in load loss to distributed solar.6
The utilities story: Good news and bad news

Utilities can gain the upper hand in winning consumer mindshare in the PEV arena because PEV charging infrastructure is a key component of the PEV equation. And, according to Accenture Consulting New Energy Consumer research, 81 percent of customers prefer buying charging services from their energy provider.7

Governmental policies need to be considered as well. In Norway, 24 percent of cars are already running on electricity, with the political support to stop selling conventional fuel cars entirely by 2025.8 In the United States, the Department of Energy unlocked $4.5 billion in loan guarantees that can be used for PEV charging infrastructure and programs.9

These policy moves are important in two ways. First, they could catalyze adoption in the same way loan guarantees accelerated solar. Second, they could de-risk utility investments in potentially riskier, more innovative and digitally enabled infrastructure and programs.

That’s the good news.

The bad news is that most utilities are just beginning to formulate an integrated PEV strategy. A window of opportunity is open now, but utilities need to act quickly to be major players in the PEV market. If they do not, other players in the PEV ecosystem (including automotive, technology and retail companies) will likely develop digital solutions and thereby win the customer.

PEVs driving value

PEVs provide an opportunity for utilities to strengthen their position in the evolving energy ecosystem and create incremental shareholder value. They can:

• Serve as a potentially significant source of EBIT growth in existing and adjacent markets.

• Support existing assets with increased load and bolstered energy prices.

• Grow the regulated rate base in a rate-neutral and total resource cost-effective manner.

• Offset load losses from proliferation of distributed solar.

• Increase share of wallet for existing customers by serving more of their total energy needs.
While PEVs are a major opportunity for utilities, they will also be a new, significant draw on the power grid—and maybe at the worst times—putting utilities at risk

PEVs will be a significant draw on the power grid and so utilities must take this into consideration in their overall strategies. According to Accenture Consulting New Energy Consumer research, 40 percent of consumers would consider an electric vehicle for their next car. If all of those consumers purchased and drove electric vehicles, load on the grid would increase by 5 to 10 percent in aggregate. Like solar, the impacts in specific areas could be much more dramatic due to localized adoption.

Normal PEV charging behaviors will put this extra load on the grid at peak times when the grid is already at capacity. Charging profiles on traditional or ‘unmanaged’ PEV charging stations (not including DC fast-charging) typically see peaks in the mid-day and early-evening periods, which overlap with peak loads on the grid. In contrast, “smart” charging shifts the PEV charging peaks to early morning hours, during off-peak grid load hours (see Figure 2).

Figure 2. Charging profile comparison.

Source: Accenture Strategy analysis.
Too few utilities are offering “smart” PEV infrastructure and programs.

Many utilities have yet to take action in the PEV marketplace. For those who have, the vast majority of their charging programs are focused on deploying traditional or unmanaged charging instead of smart charging infrastructure. According to Accenture Strategy research, fewer than 10 percent of announced utility electric vehicle infrastructure programs are deploying “smart” infrastructure and programs.12 Few offer time-of-use (TOU) or demand response (DR) capabilities to help shape customer behaviors while providing choice and control. And most are not meeting customer needs for faster charging speeds. In short, few utilities in aggregate are offering smart, digital, customer-centric solutions for the PEV market.

Yet 42 percent of consumers are willing to work with their energy provider to manage when they charge their vehicle, with time-varying rates.13 The research also found that 69 percent of consumers are interested in home energy management programs, but only 14 percent are participating,14 mostly because they are not receiving sufficient information from their utility (see Figure 3).

Utilities have not historically moved quickly in response to new technologies—and in some cases have missed the market, for example, not providing rooftop solar in response to surging consumer demand. Utilities cannot afford to repeat the same mistake when it comes to PEVs. Some utilities have developed grid-focused infrastructure solutions to similar situations in the past (e.g., home energy management, distributed energy resources), but these have not been digitally-enabled, customer-centric solutions or applications.

By contrast, consider the smart, customer-focused Nest thermostat, which “learns” your family’s typical schedule of when you are home or away and automatically adjusts the temperature accordingly. Although some utility programs use Nest thermostats, almost none have been able to do anything to link the customer-focused solution features to the operation of the grid, the way an electric vehicle would need to be integrated.

Figure 3. Consumer awareness of distributed energy resource products and/or services.

If utilities do not respond to PEVs in a digitally-enabled, customer-focused manner, they could lose the opportunity to shape customer demand and align incentives

A digitally-enabled, customer-centric, cross-industry solution for PEVs is needed. This solution should address the needs of customers (availability, affordability, connectivity) and integrate with the operation of the utility (grid reliability, load response). Companies that have created customer solutions, such as Nest and Solar City, now own the customer relationships and markets. If utilities do not develop proactive solutions, competitive third parties will steal the opportunity.

What does "good" look like from a utility's perspective when it comes to PEVs? Accenture Strategy recommends that utilities transcend their current role as just providing electrons to become providers that are partnering with customers—an individual consumer or a business—to provide the energy they need at a time and cost that is optimal for them. A "smart" charging solution would know, for example, that consumers who return from work and plug in their vehicles actually do not need their cars to be fully charged until morning, allowing charging at the off-peak hours during the night to give consumers the best deal possible. The solution would also incorporate mobile management—for example, mobile apps that direct drivers to the nearest public charging station, or that send customers a mobile push notification when their PEV is fully charged.
How utilities should respond to the PEV opportunity

What should utilities be doing to get out in front of the electric vehicle market? Here are some important steps to consider:

**Invest in “smart” PEV charging infrastructure that provides innovative rate structures and charging options.** Being able to shape PEV charging behaviors depends on developing a smart PEV charging infrastructure, connecting the utility with real-time markets. Shaping PEV charging requires a customer interface that provides rules-based charging (e.g., by default having a customer’s car fully charged by 7 a.m.) and override (charge as fast as possible right now), as well as demand response capabilities to slow or temporarily stop charging during peak events. A key to shaping charging behavior is time-of-use and/or off-peak incentive rate structures.

**Pursue partnerships with original equipment manufacturers (OEMs) and charging providers while retaining ownership of the key part of the value chain.** OEMs are a big part of the overall PEV opportunity and are already creating their partnering ecosystems. Utilities need to put themselves in a position of influence—working with OEMs and other utilities to create an interoperable platform. PG&E, for example, has established a strategic partnership with BMW for demand response through charging stations.15

**Think beyond PEV charging infrastructure, including vehicle-to-grid (V2G) technology and turnkey charging infrastructure offerings.** V2G technology could turn PEVs into full two-way distributed energy resources on the grid. This trend is still in its infancy, with several pilots just beginning, but it could prove to be a major opportunity for utilities. Utilities should also think about providing other value-added services on top of charging infrastructure solutions. For example, many small businesses will need help evaluating and installing charging stations, and utilities are well-positioned to seize that part of the market.

Plug-in electric vehicles are experiencing significant growth and are driving digital disruption across multiple industries. Utilities must respond in a digitally-enabled manner with customer-focused solutions. PEVs are a game-changing opportunity for utilities and they should not be content with sitting in the passenger seat.
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