Enhancing the customer experience of upgrading an electric service panel

An excerpt of our report in partnership with the Building Decarbonization Coalition
By Jeffrey Daigle, Bryan Jungers
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An electric service panel (also known as a breaker box or breaker panel) tends to be out of sight, out of mind for the average utility customer. Our market research shows that when a customer wants to electrify their home, upgrading their service panel is rarely considered because they may not realize it needs an upgrade.

Electrifying existing homes isn't always a simple or straightforward process. In making the switch to electric appliances by replacing gas-fired equipment, some homes may or may not need a panel upgrade to accommodate the increase in power demand from in-home technologies. Those that do need an upgrade may include homes with 100- and 125-amp panels, which are common in homes built in the 1970s or earlier. (Note: An amp is a measure of how fast electricity moves).

We recently discussed the process of upgrading electric service panels in a report published in conjunction with the Building Decarbonization Coalition. If you enjoy reading the excerpt of the report below, feel free to dive into the full report Enhancing the Customer Experience of Upgrading an Electric Service Panel (PDF) for the full scope of our research.

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The E Source-authored report for the Building Decarbonization Coalition is now available!

Read the report

The push to upgrade electric service panels

While there are challenges, there is a strong need to improve the customer experience as more people adopt clean electric technologies. In highlighting this, the Pecan Street study Addressing an electrification roadblock: Residential Electric Panel Capacity suggests that tens of millions of homes in

the US will require panel upgrades in the coming years to help achieve building decarbonization and electrification targets.

As part of this study—aimed at helping remove barriers and minimize added costs, complexity, and time for the panel upgrade process—we surveyed 10 utility representatives and identified areas of recommendations to significantly improve existing processes. Ensuring that these are adopted broadly will take more than utility buy-in and investment and also require policy-makers within the legislative and regulatory spaces to recognize the need and support these measures.

One key issue we found was that a variety of utilities don't have streamlined processes in place for the efficient and timely servicing of customers as they embark on the panel upgrade journey. This is partly a legacy issue; utility jurisdiction, oversight, and liability usually end at the revenue meter. Since the service panel lies behind the meter (that is, on the customer side), utilities traditionally don't give much thought to what goes on at the electric panel. However, to meet building decarbonization goals along with other goals, like providing access to electric vehicle charging, utilities, local governments, and state regulators need to focus on the process of replacing or upgrading legacy electric panels.

Another key issue we found was that, in the absence of thoughtful direction from regulators or legislators, the panel upgrade process is often more complicated than it needs to be, and this may lead to numerous preventable problems, such as:

- Higher costs
- Lower customer satisfaction
- Longer wait times; slower adoption
- Customers ultimately deciding not to electrify

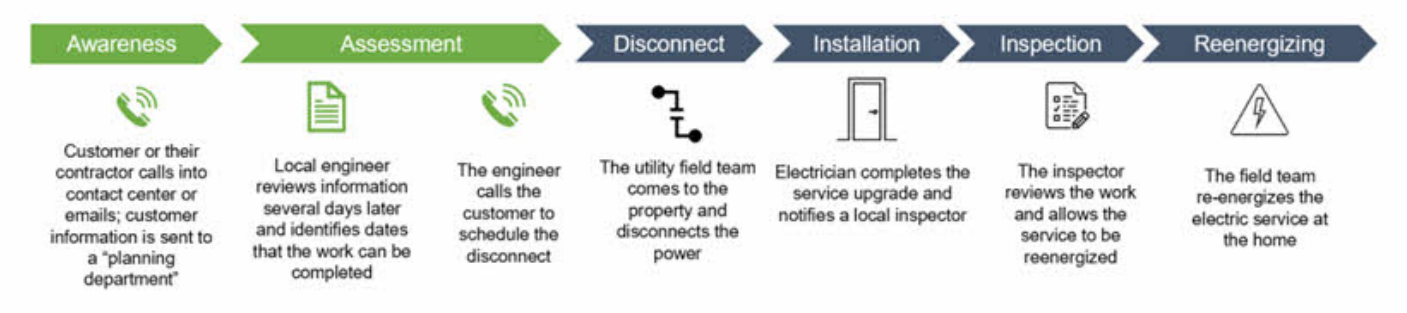
Creating a simple and affordable panel upgrade process will reduce costs of electrification and can ensure more equitable access to electrification technologies. A poorly designed panel upgrade process drives up the cost of electrification and can disproportionately affect disadvantaged communities and low- and moderate-income customers. A process that isn't proactive and planned out will miss out on cost savings for the customer and add additional hours spent by the electrician working in the home, waste time managing a confusing process, and create an unnecessary and overall negative experience with home electrification and the local utility.

Understanding the panel upgrading process

In late 2021, we interviewed 10 utilities across the US and Canada to understand their panel upgrade processes. Our analysis found that upgrade processes followed six common steps (**figure 1**):

- Awareness
- Assessment
- Disconnect
- Installation
- Inspection
- Reenergizing

Figure 1: Six steps to upgrading an electric panel



Awareness. The customer or electrician contacts the utility to begin the process. The customer is assigned a job identification number and is referred to a local utility engineer. Many customers contact the utility without having the necessary information about the service required or the load change, which can delay the customer's project. If the customer is unable to fill out the paperwork themselves, they'll need to pay for the electrician's time to estimate loads and fill out paperwork, unnecessarily increasing the cost to the customer and adding to the burden of going through the process.

Assessment. The grid distribution planner reviews load information and identifies dates for the work to be completed. The local planner, who may be an engineer or field representative, is responsible for informing the customer of any utility costs that the customer must pay.

Disconnect. The utility schedules and completes the disconnection of service to the home. The electrician may already be on-site when this happens. If not, they'll typically arrive shortly after electrical service to the home has been disconnected.

Installation. The electrician upgrades the service panel. Once service is disconnected and the home's circuits are fully deenergized, the electrician replaces the existing panel with one rated for higher amperage. This may also involve replacing existing wiring and conduit behind the panel, particularly in older homes. The electrician also sizes and replaces individual breakers on each circuit, according to the estimated load requirements of the home.

How the individuals described in the six steps behave, engage, and make handoffs throughout the process have noteworthy implications for project timing, cost, and customer satisfaction.

Inspection. The upgraded panel is inspected to ensure safety and code compliance. A licensed inspector approved by the local jurisdiction inspects the integrity of the electrician's work and certifies that it's compliant with prevailing electrical codes and standards (or not). Depending on local requirements, if there isn't proper planning, this step may be more difficult to manage and can result in the delay of some panel upgrade work or home reenergization. Delayed work can lead to higher costs to the customer (for example, more electrician hours).

Reenergizing. The utility reviews the inspection information and permit information if necessary and reconnects service to the home. The utility checks the inspector's report and other project documentation to make sure a safe reconnect can be performed. The time between service disconnect and reconnect can be anywhere between a few hours and a few days, depending on site conditions and upgrade needs. If the service is just being disconnected and then reconnected on the same day, this step tends to be simpler and typically can be completed by a single utility employee. However, if the service is being replaced or upgraded, at least two field crew members will be dispatched to support the

projects. Service upgrades may also require their own inspection, in addition to that of the panel upgrade.

The various individuals described in the six steps each play an important role in ensuring a successful panel upgrade process. How each of these people behave, engage, and make handoffs throughout the process have noteworthy implications for project timing, cost, and customer satisfaction. Regulators can collaborate with utilities to make sure each individual proceeds through these steps as efficiently as possible.

For more, continue reading Enhancing the Customer Experience of Upgrading an Electric Service Panel (PDF), prepared for the Building Decarbonization Coalition.

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