



ELECTRIFYING YOUR HOME: UNDERSTANDING YOUR ELECTRICAL SERVICE PANEL OPTIONS

Understanding your electrical service capacity can save you time and money when adding new electric appliances

SWAPPING GAS FOR ELECTRIC APPLIANCES

When adding any new electrical load like heat pumps or air conditioning a permit from the city is required, and review by your local utility may also be necessary. This requires your contractor or engineer to submit electrical load calculations to determine if your electrical service and existing electrical panel has adequate capacity for the new appliances. If you have less than 200A electrical service, this may require upgrades to your electrical service. This time-consuming and expensive process can often (but not always) be avoided through careful planning, use of new technologies and accurate alternative electrical load calculations allowable in current building codes.

The following recommendations have helped thousands of homeowners add new equipment, electrify their homes or simply upgrade appliances without the need for costly electrical upgrades and long project delays.

TOOLS TO MINIMIZE ELECTRICAL SERVICE UPGRADES

While not appropriate for every home, the following technologies and techniques, when used appropriately can help reduce or eliminate the need for upgrading your electrical service. Every home is unique, so be sure to consult with knowledgeable and licensed contractors or engineers as you plan your home upgrades.

» **ALTERNATIVE LOAD CALCULATIONS:** CA Electrical Code Section 220 offers several methods for calculating existing and new electrical loads, appropriate for different situations. Be sure your contractor is aware that there are different methods for different conditions.

- CEC Section 220.82 is designed for new construction. This is often the standard method used even for retrofits, and is not recommended for existing buildings.
- CEC Section 220.83 is designed for existing buildings and is recommended over 220.82.
- CEC Section 220.97 uses your smart meter data to determine how much extra power you have on your panel today. This method is often preferred, assuming you can provide your contractor with access to your utility historical usage.

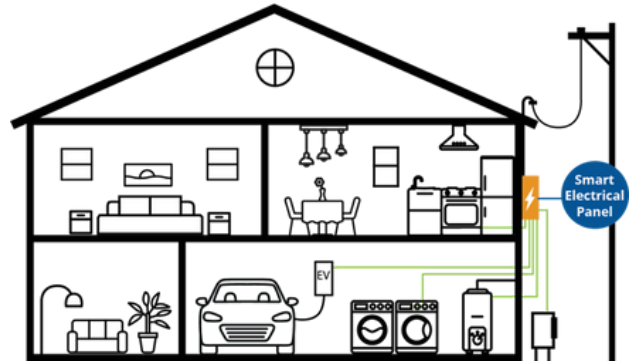
¹ Scan the QR code or click to access details about alternative load calculations, low power appliances and energy management devices in the: [“Electric Service Optimization Guide”](#) extended document.



» **LOW-POWER APPLIANCES:** There are a growing number of energy efficient appliances that can reduce the “peak” demand on electrical panels. Careful selection of these appliances will help reduce the total electrical demand on your panel. Examples include:

- » Plug and Play 120V heat pump water heaters
- » Inverter Driven Heat Pumps for space heating and cooling (HVAC)
- » Downsizing your HVAC system after air sealing and insulating your home

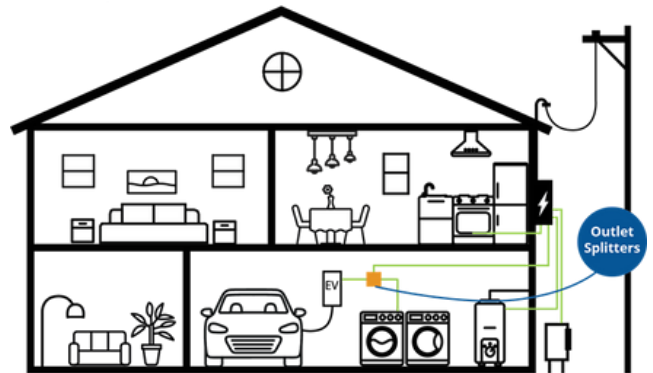
Smart Electrical Panels



» **ENERGY MANAGEMENT SYSTEMS (EMS):**

EMS systems intelligently manage the electrical loads in your home. These “Smart Electric Panels” have been used for years in commercial buildings and are increasingly popular in existing homes. Electronic devices like “Outlet splitters” share a single circuit with two devices (like an electric dryer and an EV charger) can manage total electrical demands on your panel while ensuring you have the power you need, when you need it.

Outlet Splitters



SUCCESSFUL CASE STUDIES

Meet the **Davis**, **Martinez** and **Kim** families. These are real families in California that were able to successfully electrify their home with existing electrical service capacity by using a combination of methods.

- » Calculating loads under CEC 220.87 in conjunction with a circuit control unit, the **Davis** family fully electrified their home with a 125A panel, including installing an electric vehicle charging station.
- » Using CEC 220.83, the **Martinez** family electrified their home with their 100A panel, eliminating their reliance on expensive propane for water and home heating.
- » Using NEC 220.70, the **Kim** family electrified their home, installing a smart electric panel with digital energy management to avoid costly service upgrades. The pre-and-post-upgrade stories are included in the [extended document](#).

ALTERNATIVE LOAD CALCULATION TEMPLATES

An essential part of any building permit application is the electrical load calculations. A sample template that may be used to submit along with building applications has been made publicly available for download and [may be downloaded from here](#).

Disclaimer: The information presented in this document serves as a general guide for building code compliance and the utilization of alternative methods for calculating electrical loads. Content herein does not constitute legal advice. Always consult licensed professionals regarding the details of any construction project. Richard Heath & Associates Inc. disclaims any implied warranty of the information provided herein including any warranties of merchantability and or fitness for a particular purpose of this content.