Top 5 Tips for Going Electric and Preventing Costly Electrical Service Upgrade

SILICON VALLEY CLEAN ENERGY

By implementing these best practices, contractors can help homeowners potentially save between $3,000 and $20,000+ while also reducing project delays by 6 to 12+ months.

Recent advances in technology and electric home equipment mean that costly electrical panel or service upgrades, such as increasing from 100 to 200 amps, are often unnecessary when transitioning to efficient heat pumps, electric appliances, and home electric vehicle chargers. In the past, service upgrades were a common recommendation, but today there are practical ways to avoid expensive upgrades thanks to ongoing efficiency improvements and research. Making the switch to all-electric not only reduces pollution but also improves community health and safety.

Recent data indicates that over 90% of homes will be able to fully electrify on 100 amps without requiring a larger panel or utility service upgrade. The following guidelines can help contractors and customers maximize a home's existing power.

Panel Optimization

Consolidate: If there are more lighting or convenience circuits than needed, consolidate circuits within a new junction box or other method of combining two lightly loaded branch circuits and run a new wire from that junction box to an existing 120V breaker.

Free panel space: If all breaker slots are full, use skinny ("slimline") or tandem breakers that provide two distinct breakers in one 1" breaker slot.

10-20A saved

HVAC

Specify variable speed heat pump HVAC systems with 120V air handlers and manufacturer provided "communicating" (2-wire) thermostats. Not only do these systems save energy and lower customer bills, but they can also power the air handler off the heat pump's circuit, avoiding a separate 240V air handler circuit and freeing up the existing 15A furnace circuit.

Note: In our climate, auxiliary heat ("electric strip heating") should be avoided by properly air-sealing conditioned spaces and sizing HVAC systems and any needed ductwork appropriately.

30-60A saved

Heat Pump Water Heater (HPWH)

Install a 240V 15A or a 120V 15A HPWH instead of a 240V 30A model when possible.

Note: Installers typically recommend selecting HPWH products based on first-hour rating requirements, which often includes upsizing the tank size by one or two sizes when replacing a gas storage tank water heater.

15A saved

Electric Cooking and Clothes Drying

Cooking: Order 40A induction/electric range models from major manufacturers rather than the default 50A version.

Clothes Drying: Consider a new 120V ventless heat pump clothes dryer, or go a step further with a combo washer/dryer to save two breaker slots while also making laundry easier.

10A saved

15-30A saved

Electric Vehicle (EV) Charging

"Right-sized" charging: Customers that average less than 48 miles per day of driving should consider installing either Level 1 charging (120V 20A circuit) or "Low-Power Level 2" (240V 20A circuit) rather than 50A Level 2 charging.

20-30A saved

Circuit sharing: Install a circuit sharing device set to pause the EV charger when the primary circuit is operating. Recommended pairings for adding a circuit sharing device include (in order of priority):

1. Electric cooking (range or wall oven) and EV charger — 20-50A saved

2. Electric dryer and EV charger — 20-30A saved

3. HPWH and EV charger — 15-30A saved

Need more support?

Our team is here to help you make the transition to clean energy. Contact us at (833) 243-4235 or visit goelectric.svcleanenergy.org

Additional Resources:

- SVCE-RHA “Electric Service Optimization”
- The City of Palo Alto’s Guide to Electrification
- SVCE Contractor Training Program

All Electric 100 Amp Home (2,000 square feet)

Ducted heat pump, medium power heat pump water heater, hybrid heat pump dryer

Device Volts	Device Amps	100 Amp Panel		Device Amps	Device Volts
120	8	Lights/Plug 15	15 Lights/Plug	8	120
120	8	Lights/Plug 15	15 Lights/Plug	8	120
120	8	Lights/Plug 15	15 Lights/Plug	8	120
120	10	Garbage Disposal 20	20 Kitchen Outlets	13	120
120	7	Refrigerator 20	20 Kitchen Outlets	13	120
120	0	Spare 15	20 Dishwasher	12	120
120	0	Furnace (removed) 15	20 Clothes Washer	13	120
240	20	Heat Pump Centrally Ducted 30	20 Hybrid Heat Pump Dryer	14	240
240	20	EV Charger 25	50 Range (cooktop +oven)	40	240
240	16	Solar Input 20	20 Heat Pump Water Heater	12	240

House square footage = 2000 Total Counted Panel Amps = 96.7

Additional House Information

- 4 occupants
- EV charging up to 19 miles/hr
- Located in California climate zone 3 (SF Peninsula)
- Some insulation
- 38,000 Btuh heating and cooling
- 60-80 gallon heat pump water heater
- 4-burner induction or standard electric range
- 7.4 cu. foot hybrid heat pump dryer
- A 20-amp circuit will support a 3.8 kW inverter. (Many 3.8 kW inverters can support upt to a 5.8 kW solar array depending on inverter load ratio)

Diagram creation and design by: Josie Gaillard, Courtney Beyer, and Tom Kabat

Load calculations per the National Electrical Code Section 220.82(B) and 220.83(B)

The “Watt Diet” sample load calculations for a 2,000 square foot all-electric home using a 100A panel. More information available at https://www.redwoodenergy.net/watt-diet-calculator

Disclaimer: The information presented in this document serves as general guidance for managing electrical loads. Content herein does not constitute legal advice. Always consult a professional licensed electrician to discuss the details of your electrical panel and construction project.