



THE ELECTRICIAN'S GUIDE:

Installing Electric Vehicle Charging Stations at Single-Family Homes

Preparing a home for electric vehicle charging requires the collaboration of several parties to help our mutual customers make the right decisions for their personal situations. Southern California Edison (SCE), electricians*, customers and cities each play important roles in this process.

This guide provides useful information on the process for preparing single-family residences for safe and reliable electric vehicle (EV) charging.

The process *may* include installing a dedicated circuit for EV charging, installing an EV charging station, upgrading an existing electrical panel, or adding a second electrical panel, meter socket box and/or two-meter socket panel to accommodate separate EV metering. Installing this equipment is **optional** and depends on the **SCE rate plan** the customer enrolls in and the level at which the customer **chooses to charge the vehicle** (120 volts or 240 volts). Each customer should select his/her rate plan and charging level before the electrician begins any electrical work on the house. Otherwise, customers and electricians alike run the risk of costly delays.

Before you assess your customers' home panel and wiring needs, please ensure that customers who live in SCE's service territory contact us to learn about their rate plan options and how each rate plan may affect their home panel, wiring and electric vehicle charging options.



Please ask your customer to call an **SCE Home Fuel AdvisorSM**:

1-800-4EV-INFO
(1-800-438-4636)



Customers can also visit:
sce.com/ElectricVehicle



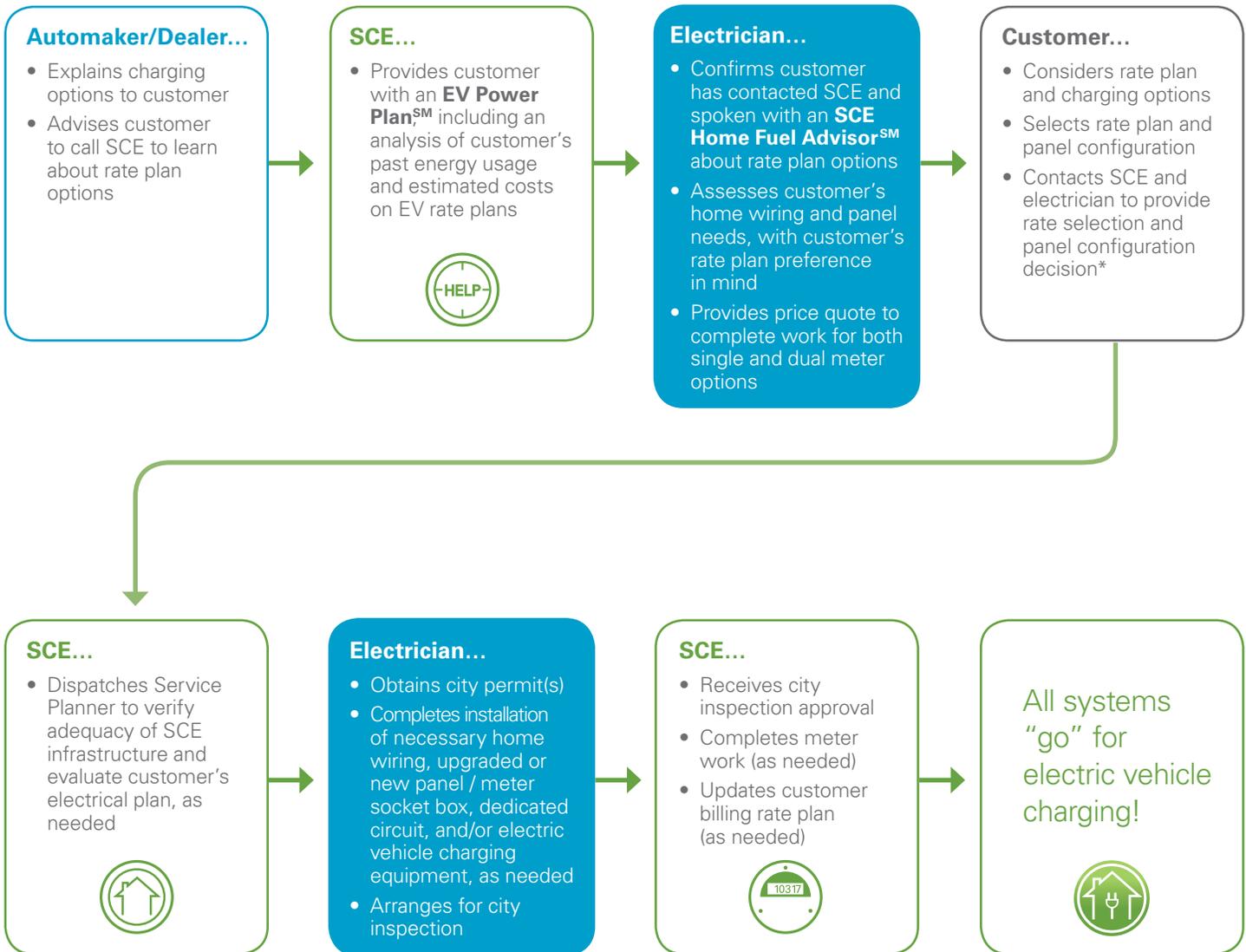
For step-by-step training modules, customer handouts and more, visit:

sce.com/EVInstall

*The term "electrician," as used throughout this guide, includes entities such as independent electricians, electrical contractors and third parties offering end-to-end EV services.

Installation Process

The flowchart below illustrates the basic processes used by SCE to prepare single-family residences for electric vehicle charging. Also shown are the points at which electricians play an especially important role in moving the installation process forward.



* By reminding your customer to call both you **and** SCE after deciding on the electrical work, SCE can send a Service Planner to the customer's home so you can finish your work as quickly as possible. Knowing a customer's rate plan selection, electrical vehicle charging level, and planned panel configuration will allow SCE's Service Planner to properly inspect the local transformer and service drops and evaluate the customer's electrical plan.

Important Steps for Electricians

1. Confirm customer has contacted SCE about rate plan options and implications **before** you conduct a home assessment of electrical panel and wiring needs. If not, direct your customer to call 1-800-4EV-INFO (1-800-438-4636) M-F, 8:00 am - 5:00 pm.
2. Evaluate residential electrical panel and wiring for **capacity** to charge the electric vehicle at the desired charging level.
3. Provide a price quote to complete electrical work for **all** applicable rate/panel options.
4. Once SCE has approved the proposed electrical plan, upgrade the existing panel or add a second panel or meter socket box, as necessary, in accordance with customer's selected rate plan.
5. If customer selects the Electric Vehicle Plan (two meters): Install the appropriate panel option and remember that this power is for **EV charging only**. *Note: SCE will install the second meter after the panel is installed and the city approves the installation.*
6. Refer to **SCE's Electric Service Requirements (ESR)** for complete panel configuration details (sce.com/EVInstall).

Rate/Panel Options

The combination of SCE electric vehicle rate plans and panel configurations yields 6 rate/panel options:

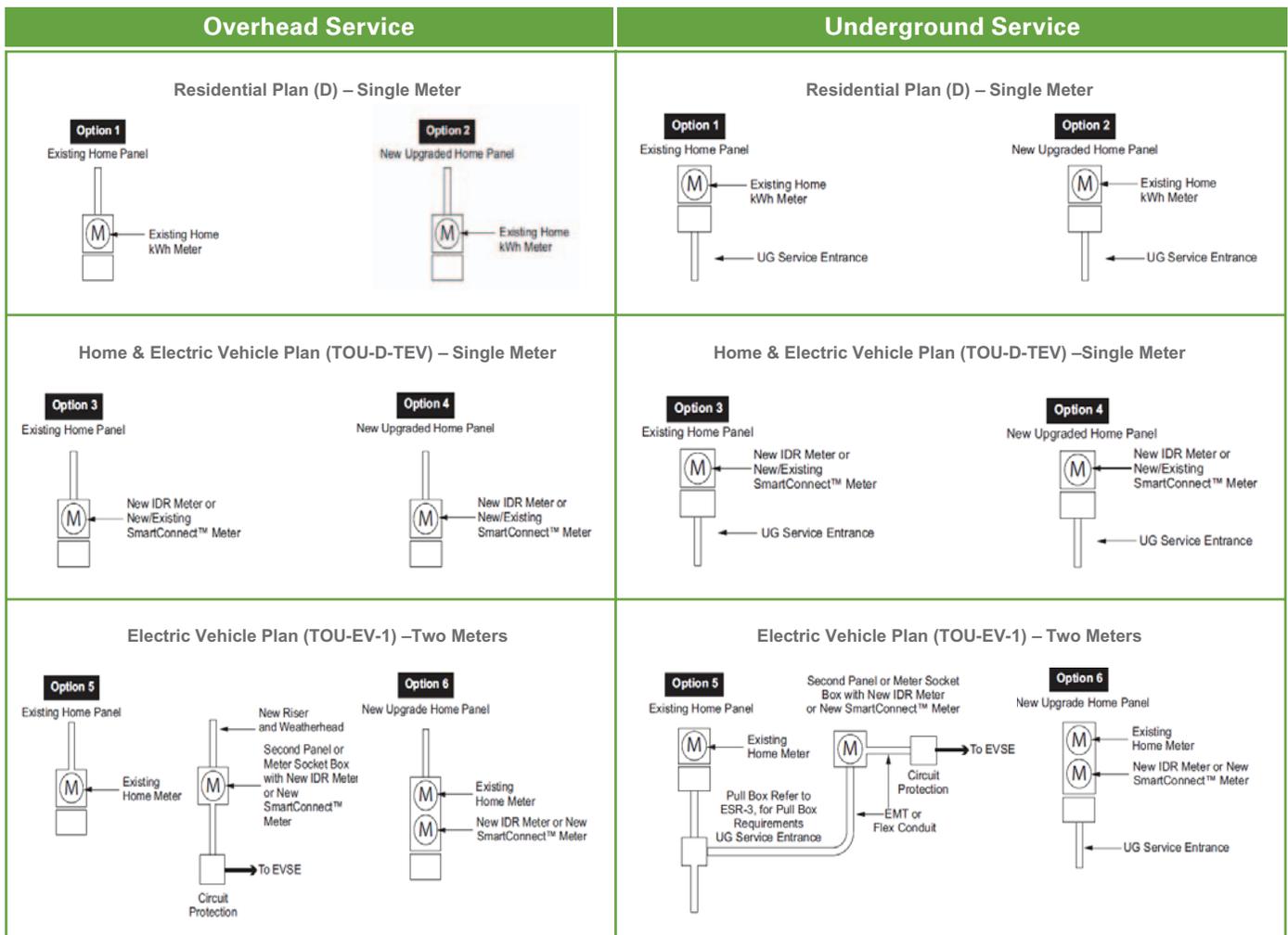
Rate Plans	Rate Description	Panel Choices		
		Use Existing Panel	Add 2nd Panel or Meter Socket Box	Upgrade Existing Panel
Residential Plan (Your Current Rate) <i>Single Meter</i>	Your Current Rate Home and electric vehicle loads measured together	 Option #1 (no meter change)	N/A	 Option #2 (meter may need to be replaced)
Home & Electric Vehicle Plan (TOU-D-TEV) <i>Single Meter</i>	Time-of-Use Tiered Rate* Home and electric vehicle loads measured together; rates higher during the day and lower at night	 Option #3 (meter may need to be replaced)	N/A	 Option #4 (meter may need to be replaced)
Electric Vehicle Plan (TOU-EV-1) <i>Two Meters</i>	Time-of-Use Rate Electric vehicle load metered separately from home load; home remains on current rate and meter; electric vehicle rate is higher during the day and lower at night	N/A	 Option #5 (panel upgrade or addition must take place before second meter is installed) See page 4 for detailed panel configurations.	 Option #6

*With tiered rates, cost per kWh increases with the amount of electricity used.

Panel Configurations

SCE publishes and maintains an Electrical Service Requirements (ESR) document* describing SCE rules pertaining to electrical service connections and customer installations of service wiring and equipment. Creating an acceptable work plan for electric vehicle charging, by adhering to ESR requirements, will help you and your customers save time and money by avoiding the planning (or beginning) of work that otherwise may not be approved by SCE and/or your local building inspector.

The following abbreviated information can be found in its complete form in Chapter ESR-1, Section 5. The figures below show both overhead (left side) and underground (right side) connection diagrams for the six most common rate/panel options:



Note 1: SCE provides *only a single service line* for all panel configurations, regardless of whether one or two panels are installed.

Note 2: Where at all possible, the second panel or meter socket box shall be at the same location and directly adjacent to the existing metering.

Key

- UG: Underground
- OH: Overhead
- IDR: Interval Data Recorder
- EMT: Electrical Metallic Tubing
- EVSE: Electric Vehicle Service Equipment

* SCE's Electrical Service Requirements are available on the web at sce.com/EVInstall.

Panel Configurations

The following abbreviated information can be found in its complete form in Chapter ESR-5, Section 9. The figures below describe required clearances when electrical panels are either upgraded or added to a residence:

Figure 5–4: Separation of Meter Assemblies for Electric and Gas Services

1. Maintain a 3-foot clear, level, and unobstructed workspace in front of electric service equipment.
2. Plumbing fixtures extending more than 6 inches out from wall surface must be located 18 inches minimum from the outside edge of the meter panel.
3. This drawing pertains to both overhead and underground electric service applications.
4. Size and dimensions of panels will vary. Drawings are not to scale.

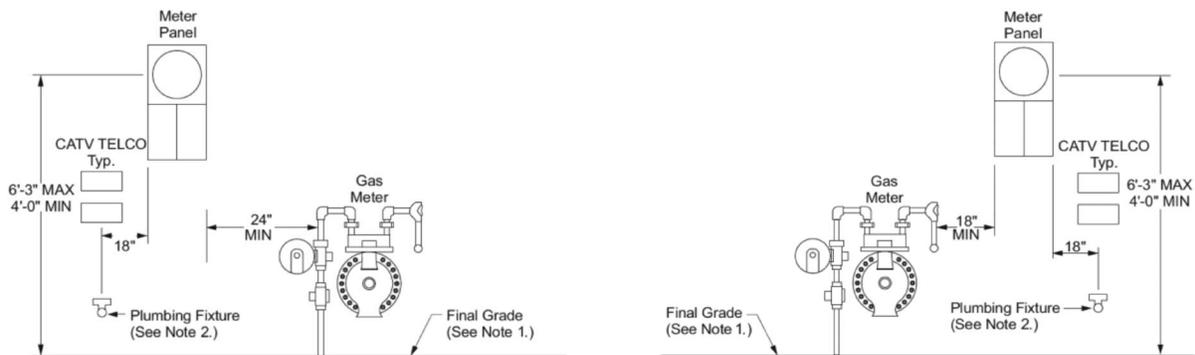
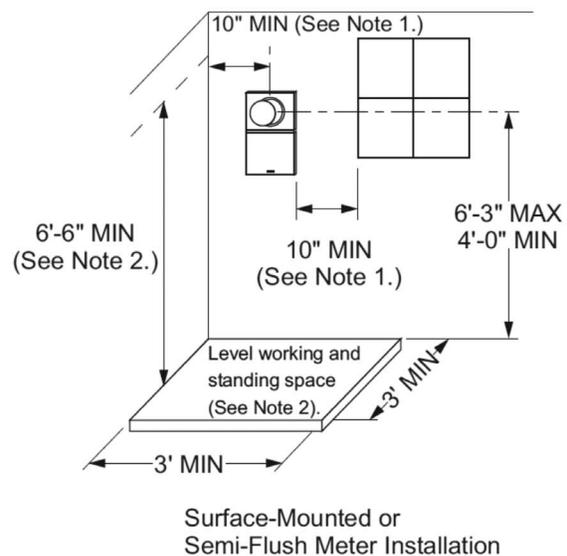


Figure 5–5: Surface-Mounted or Semi-Flush Meter Installation

1. The horizontal clearance from the centerline of the meter to the nearest side wall or other obstruction shall be 10 inches minimum. A horizontal clearance from the edge of the meter panel to the edge of a window or doorway (including sliding glass doors) shall be 10 inches minimum. A gas meter or plumbing fixture that does not protrude more than 6 inches out from the wall, or extend less than 18 inches horizontally from the outside edge of the meter panel, shall not be considered an obstruction. See Figure 5–4 (Page 5–24).
2. A level working and standing surface, clear and unobstructed, entirely on the property of the customer, shall be provided. The minimum width of the workspace shall be 36 inches overall, but need not be centered beneath the meter. The minimum depth of the workspace shall be 36 inches. Where meters are enclosed in a closet or recessed in an enclosure, the depth of the workspace is measured from the outer face of the closet or recess. The minimum height of the workspace shall be 78 inches.



Additional sections of SCE's Electrical Service Requirements may be applicable depending on customer infrastructure. Please review the ESR in full to ensure comprehensive compliance with these requirements.

* SCE's Electrical Service Requirements are available on the web at sce.com/EVInstall.

Best Practices for Electricians to Help Customers Get Ready for EV Charging



- ✓ Anticipate playing a coordinating role among the customer, SCE, local authority having jurisdiction and possibly the property owner or homeowner's association.
- ✓ Encourage your customer to contact SCE and speak with an **SCE Home Fuel Advisor** at **1-800-4EV-INFO** (1-800-438-4636), M-F, 8:00 am - 5:00 pm, before conducting your initial home assessment to ensure the customer understands SCE's EV rate plans and installation implications.
- ✓ Be familiar with SCE's EV rate plans and installation implications to help guide the customer through the process.
- ✓ Be familiar with SCE's ESR to ensure your plans and work are ESR-compliant.
- ✓ Visit sce.com/EVInstall and review the ESR on a quarterly basis for possible EV updates.
- ✓ Provide customer with estimates for one and two-meter options to prevent delays and added costs if customer changes rate plan choice.
- ✓ Participate in the SCE Service Planner's visit to the customer site in person or by phone to discuss the electrical plan, as necessary.
- ✓ Confirm the customer's plan is approved by an SCE Service Planner, as necessary, before initiating the work.

