Sizing solar for an electric vehicle

How much solar do you need to power your electric vehicle (EV) with the sun?

Solar United Neighbors has created a simple, conservative estimate for homeowners considering combining EVs with rooftop solar. Your exact numbers may vary. If you would like state-specific calculations or have questions, please email us at info@solarunitedneighbors.org

How much do you drive in a year?

Miles driven annually	Solar capacity needed**
3,500	1 kW
7,000	2 kW
10,500	3 kW
14,000	4 kW
17,500	5 kW
21, 000	6 kW

**Calculated using 3.5 miles per kWh, 15% AC to DC conversion loss for charging, and a solar production factor of 1.2. See opposite side for details on how to calculate.

How to calculate sizing your solar system for an EV

Similar to miles per gallon in gas-powered cars, the energy required to drive an EV can be measured in miles per kilowatt-hour (kWh). Kilowatt-hours are how electrical energy is measured. Follow the steps below to estimate the size of a solar system you will need to power your electric vehicle.

1) Determine how many miles you travel each year in your EV.
2) Determine how many miles your car travels per kWh. Visit: https://www.fueleconomy.gov/feg/alternatives.shtml.
3) Determine the amount of energy in kWhs you will need to power your vehicle for the miles you drive annually.
    a) Divide number of annual miles you drive annually per the miles your EV travels per kWh. Example: **13,000** annual miles/**3.5 miles per kWh = 3,714 kWhs** (your EV may differ).
    b) Factor in AC- DC conversion losses for charging (typically 10-15%).
4) Work with your installer or visit NREL PV Watts to determine the amount of solar capacity needed at your site to produce the kWhs for your EV.
5) Add the additional solar capacity needed for your EV to your total system size.

Want to learn more? Visit: **SolarUnitedNeighbors.org/EVs**