

EV Charging Time Calculator

Estimates EV charging time, grid energy, and miles added from battery capacity, state-of-charge window, charger power, efficiency, and vehicle efficiency.

Generated October 10, 2026

<https://www.elecatrix.com/solar-backup-power/ev-charging-time-calculator/>

Inputs

Input	Value	Unit
Battery capacity	75	kWh
Start charge	20	%
Target charge	80	%
Charger power	9.6	kW
Charging efficiency	90	%
Efficiency	3	mi/kWh

Results

Result	Value	Unit
Battery energy added	45	kWh
Grid energy used	50	kWh
Estimated charging time	5.2083	h
Estimated miles added	135	mi
SOC window	60	percentage points

Calculation details

Detail	Value	Unit
Calculation basis	Charging time divides grid energy by charger power. Grid energy adjusts battery energy added by entered charging efficiency.	
Selection boundary	EV charging estimate only; no EVSE circuit sizing, load management, utility tariff, vehicle taper curve, battery temperature, listing, or code-compliance result is made.	

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Formulas

$\text{SOC window (\% points)} = \text{target SOC} - \text{start SOC}$

$\text{Battery energy added (kWh)} = \text{battery capacity} \times (\text{SOC window}/100)$

$\text{Grid energy (kWh)} = (\text{battery energy added}/\text{charging efficiency (\%)})/100$

$\text{Charging time (h)} = (\text{grid energy}/\text{charger power (kW)})$

$\text{Estimated miles added} = \text{battery energy added} \times \text{miles per kWh}$

Warnings and limitations

This EV charging time estimate uses entered battery and charger assumptions only. It does not size EVSE circuits, evaluate load management, model vehicle taper curves, or approve code compliance.