

Residential Electric Vehicle Infrastructure Costs

Home charging is the most common electric vehicle (EV) charging method for current EV drivers. Adding an EV charger to your home can also increase the convenience of switching to an EV from a conventional vehicle. This fact sheet covers the two main costs EV owners who live in single-family homes will have to consider: upfront charger and installation costs and ongoing costs.

COST 1: UPFRONT CHARGER AND INSTALLATION COSTS

Every EV comes with a Level 1 charger and adapter you can use with a 120-volt (V) outlet, which provides about four to six miles of range per hour.

If you want faster charging, you can install a Level 2 charger. According to the Alternative Fuels Data Center, it typically costs \$380–\$690 to purchase and an additional \$1,300 per connector to install a Level 2 charger.¹ There are Level 2 chargers available that are more than \$690. For example, installation costs averaged around \$1,500 in Dakota Electric Association’s service territory.²



Due to the additional wiring required, the installation costs can be higher if you have a detached garage without electricity or a 240V outlet, so it’s essential to consult an electrician before purchasing a Level 2 charger. With detached garages, it may be cheaper to set up a new service panel connected to a nearby utility pole instead of connecting to the home’s service panel. However, this would incur a monthly charge for the second panel beyond any upfront installation costs. Like other projects, consult different electricians to receive multiple bids and choose the one best suited for you.

Many utilities in Minnesota offer charging incentives to offset the cost of buying an EV charger. Most utilities offer a \$500 rebate for a Level 2 EV charger if you subscribe to a time of use or off-peak rate (see ongoing costs below for more information) and purchase a compatible charger approved by your utility. To find these rebates, visit [Drive Electric Minnesota’s Electric Vehicle Incentives Database](https://driveelectricminnesota.com/electric-vehicle-incentives-database).³

¹ “Procurement and Installation for Electric Vehicle Charging Infrastructure,” Alternative Fuels Data Center, US Department of Energy, accessed June 11, 2024, <https://afdc.energy.gov/fuels/electricity-infrastructure-development>.

² Dakota Electric Association representative, email message to author, April 26, 2024.

³ Electric Vehicle Incentives Database (Charging incentive; published December 20, 2023), <https://airtable.com/appAbxys0hRbvuvSX/shrcQRnBJBVswakil/tblVYDAzgsy1d6kcz?backgroundColor=red&viewControls=on>.

COST 2: ONGOING COSTS

The main ongoing costs of EV charging at home are energy and other charges to help utilities recover costs for metering, conservation improvement, low-income programs, purchasing energy, electricity generation, and other expenses. You will find these charges reported on your electric bill.

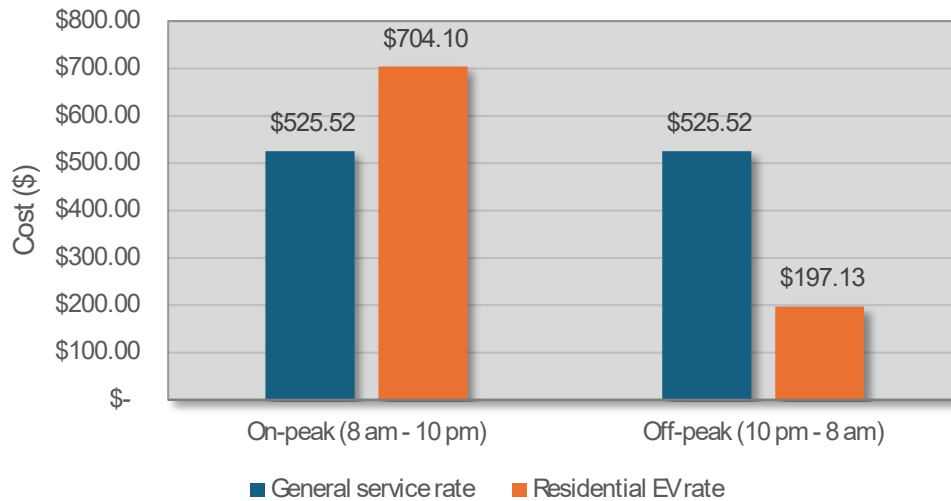
Many utilities offer EV-specific rates that are either a time of use or an off-peak rate to encourage customers to charge at times that are more beneficial to the electric grid. Compared to the default residential rate, the following EV-specific rates can significantly reduce ongoing costs:

- A time of use rate is a time-based rate with differing costs depending on the time of day when electricity is used. It incentivizes charging during off-peak hours when costs are lower than average than charging during peak hours.
- An off-peak rate is a time-based rate that only allows charging during off-peak hours.
- A residential rate is the default flat rate for all electrical components in your home. At this rate, it costs the same to charge your vehicle at any time of the day, but it tends to cost more long term than an off-peak rate.



Figure 1 displays an annual cost estimate of charging on Minnesota Power’s residential rate and residential EV service rate based on the average miles driven by a Minnesota driver and the average fuel efficiency of an EV.⁴

Figure 1. Annual cost to the average Minnesota driver of charging an EV on Minnesota Power’s residential rate versus its residential EV service rate



Sources: Stephanie Nieves, “Average miles driven by state (2024)”;
Minnesota Power; “Residential Electric Vehicle Program,”
Minnesota Power; “Residential Rates,” Minnesota Power; M. Moaz Uddin & Emmy Curtiss, “Tool helps
Minnesotans calculate fuel cost savings from switching to an electric vehicle.”

Note: The costs were calculated based on the average Minnesotan driver’s annual miles traveled acquired from [Policygenius](https://www.policygenius.com) and the estimated fuel efficiency of an EV.

TAKEAWAYS

Charging your EV at home comes with different upfront and ongoing costs, but some programs can help minimize those costs. Talk to your utility to see if there are any specific charging rates and rebates for EV owners. They may also have a list of recommended electricians who can install Level 2 chargers.

⁴ Stephanie Nieves, “Average miles driven by state (2024),” Policygenius, updated February 2022, <https://www.policygenius.com/auto-insurance/average-miles-driven-by-state/>; “Residential Electric Vehicle Program,” Minnesota Power, accessed February 2, 2024, <https://www.mnpower.com/ProgramsRebates/ElectricVehicles>; “Residential Rates,” Minnesota Power, accessed April 2, 2024, <https://www.mnpower.com/ResidentialRates>; M. Moaz Uddin & Emmy Curtiss, “Tool helps Minnesotans calculate fuel cost savings from switching to an electric vehicle,” Drive Electric Minnesota, January 31, 2023, <https://driveelectricmn.org/tool-helps-minnesotans-calculate-fuel-cost-savings-from-switching-to-an-electric-vehicle/>.



Facilitated by the Great Plains Institute, Drive Electric Minnesota is a partnership of electric vehicle (EV) champions, including automakers and auto dealers, utilities, charging companies, environmental groups, and state and local government. The coalition paves the way for the deployment of EVs and charging infrastructure through public-private partnerships, financial incentives, education, technical support, and public policy. Visit us at www.DriveElectricMN.org. Contact us at driveelectricmn@gpisd.net.