

HOW TO INSTALL ELECTRIC VEHICLE CHARGING STATIONS AT MULTI-UNIT DWELLINGS

Guide



DRIVE ELECTRIC
CHICAGO

An initiative of:



Rahm Emanuel,
Mayor

Supported by:



**RESERVED
FOR
EV & EREV
PARKING
ONLY
LEVEL TWO
CHARGING
STATIONS**

Plug-in electric vehicles (PEVs) are moving into the fast lane in record numbers. In fact, Navigant Research predicts that, by 2017, there will be more than one million PEVs on the road.

Why not? When you consider how sleek, silent, and fun they are to drive—and that they help reduce pollution by nearly 75% over petroleum-powered vehicles—it's easy to see why electric vehicles are an enticing option. And, with federal and state tax incentives, they're getting more affordable every day.

Best of all, PEVs are fueled by plugging in at any location that offers access to electricity. According to ComEd, the home is the primary charging location for most PEV owners. In Chicago, where 69% of residents live in multi-unit dwellings, or MUDs, providing a location to charge PEVs is a big opportunity. That's why Mayor Emanuel and the City of Chicago in partnership with Chicago Area Clean Cities (CACC) have launched the Drive Electric Chicago program to help PEV owners and their building managers find the best solution for making charging PEVs easy and cost-effective.



Photo courtesy USDOE – <http://images.nrel.gov/>



Photo courtesy USDOE – <http://images.nrel.gov/>

TYPES OF CHARGING STATIONS

In Chicago, the average daily commute is 22 miles. That's well within the battery range of most electric vehicles, so most drivers who charge their PEVs overnight are within range for a round-trip commute every day without the need for another charge. When it comes to charging a PEV, there are three basic types of charging stations. Level 1 charging can take up to 18 hours to fully recharge, while Level 2 charging stations are about twice as fast. Level 3 charging stations—often called DC (direct-current) fast charging equipment, can recharge 80% of the batteries in less than 30 minutes.

Level 1 Charging Stations

With Level 1 charging, the cable can be plugged into a standard 120V household outlet. A Level 1 cable is included in most PEVs from major manufacturers, so there is no additional cost or installation required. Because Level 1 takes as much as 10 to 20 hours to fully charge the battery, it is recommended for drivers with regular schedules or short commutes. If an outlet does not already exist, installing one can cost \$2,300.

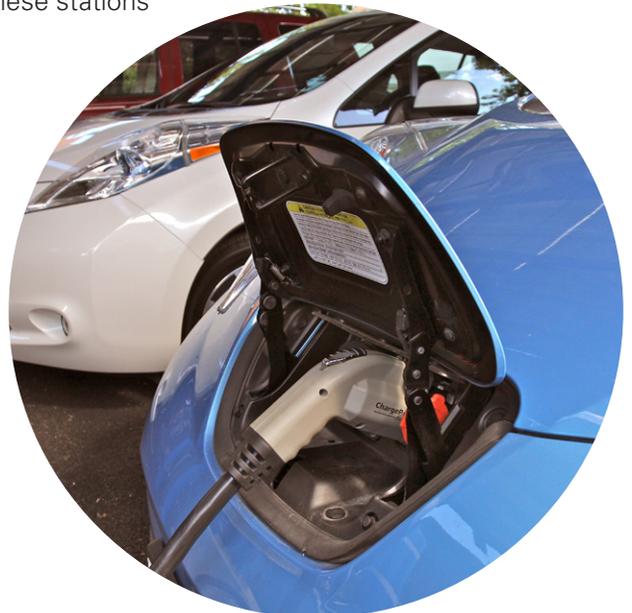
Level 2 Charging Stations

These charging stations utilize 240V, similar to the energy used by major household appliances, and can fully charge the battery in about 3 to 8 hours. They often require installation by a certified electrician and can cost as much as \$5,000. The good news is that Illinois residents qualify for a rebate from the Illinois Department of Commerce and Economic Opportunity (DCEO) of up to 50% of the cost of installation. Because it offers a much faster charge than Level 1 charging stations, it is recommended for drivers with irregular schedules or longer commutes.

Level 3 Charging Stations

The most powerful charging method, is usually used for public charging stations at 480 volts. Also known as Direct Current (DC) or Fast Charging, these stations can recharge 80% of batteries in less than 30 minutes.

- How much do Level 3 charging stations cost?
\$10,000–\$80,000
- Does the DCEO rebate also apply to Level 3?
Not currently in rebate program
- Are all models capable of using a Level 3 charging station?
Not all PEV models can currently use a DC fast charging station. Check your user's manual or consider when researching a PEV purchase or lease.



There is considerable diversity in cost and electrical requirements among different types of charging options. Residential and public charging can be broadly separated into four groups:

Charging Station Type	Power Supply	Charge Time	Miles Gained From 1 Hour of Charge	Installation Cost	Equipment Cost	Impact on Environment
Level 1 Outlet	120V	6 to 18 hours	2 to 5 miles	\$0 to \$250	\$0 to \$1,000	1.2 kW (Equivalent to one toaster)
Level 1 Station	120V	6 to 18 hours	2 to 5 miles	\$1,000 to \$1,500	\$500 to \$700	1.9 kW (Equivalent to 1-1/2 toasters)
Level 2 Station (Resident & Public Charging Station)	208V to 240V	3 to 8 hours	10 to 20 miles	\$2,000 to \$10,000	\$400 to \$11,000	3.3 kW to 7.2 kW (Equivalent to 3 to 6 toasters)
Level 3 DC Fast Charging Station	Up to 480V	Less than 30 minutes	60 to 80 miles	Average approx. \$20,000	\$10,000 to \$50,000	35–50 kW (Equivalent to 42 toasters)

INSTALLATION

Ideally, there is suitable electric infrastructure accessible near a parking spot so a charging station can be easily mounted on a nearby wall or an outlet can be installed. When there is not suitable electricity nearby, installation can be much more complicated and costly. Taking the first steps to install PEV charging stations for multi-unit dwelling (MUD) residents to use takes planning and collaboration between tenants, property managers and owners, electricians, ComEd, and the City of Chicago. Following is a brief illustration of some of the steps involved in the installation process.

Building Management Track

Determine charging needs of residents

1

The building management or homeowners association may want to determine the level of interest in PEVs among residents before installing a public PEV charging station.

Hire electrical contractor or public charging station manager

2

Consult with an electrical contractor about existing circuitry, electrical capacity, and metering options in order to determine the charging station installation that best suits resident needs. All PEV charging station installers must be certified by the Illinois Commerce Commission to qualify for the State's rebate program.

Consult with rebate program

3

Consult State's EV Infrastructure Rebate Program for eligibility criteria.

Notify local electric utility

4

Contact the local electric utility. ComEd requests customers to contact them either online at its PEV registration page or by calling 866-NEW-ELEC (866-639-3532).

Choose charging station location

5

Choose the location for the PEV charging stations. For buildings with open parking, you may want to designate spaces for PEV users. For buildings with reserved spaces, you may need to alter parking arrangements so that the PEV charging station is located as close as possible to spaces reserved for PEV users and to an electricity source.

Obtain permit

6

Obtain an electrical permit from the City of Chicago. Your electrical contractor can do this on your behalf. The City of Chicago offers an Easy Permit Process program, where permits can be processed within 1 day.

Install outlet or charging station

7

Have your contractor complete the installation. Your contractor should also arrange for the City of Chicago to inspect the new outlet after installation.





Resident/PEV Owner Track

Get permission **1**

Tenants or unit owners should contact their building management or homeowners association to request installation of charging station.

Hire electrical contractor **2**

Consult an electrical contractor about existing electrical capacity, metering options, and physical layout of parking and determine the most appropriate charging level and location of charging stations.

Consult with Rebate Program **3**

Consult State's EV Infrastructure Rebate Program for eligibility criteria.

Consult with building manager/HOA **4**

Discuss existing policies and constraints (e.g., deed restrictions) with building management or homeowners association.

Agree on ownership and maintenance **5**

Work with building management to agree on terms of ownership and maintenance.

Obtain permit **6**

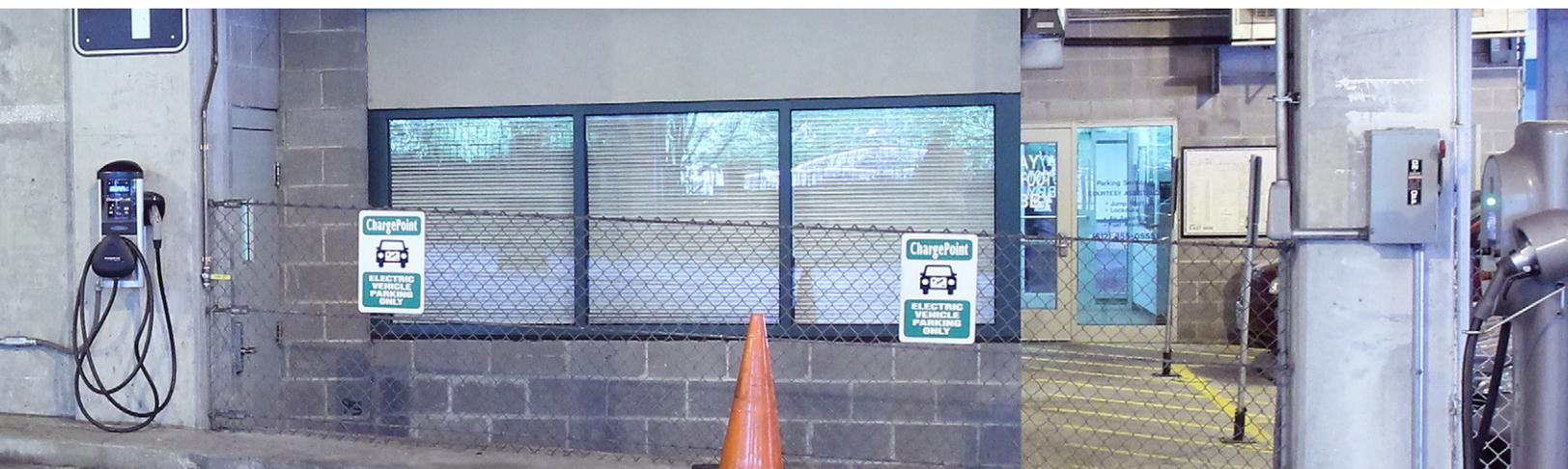
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Register your vehicle **8**

Register your PEV with ComEd so the utility can assess the electrical load needs in your area.



PAYMENT OPTIONS

Many factors come into play when making arrangements to cover the cost of installing and charging PEVs owned by MUD residents. Residents who install their own charging units will cover the cost of installation and equipment. Building owners—whether or not they decide to install a public charging station—have some decisions to make about how they will charge residents for electricity usage.

Who pays for the electricity?

PEV owners who charge their vehicles in the building's parking area will consume more electricity than other residents. Building owners have a few options for how they will pay for this increased electricity usage:

- Building owner covers electricity cost. When the building owner installs a public PEV charging station, it's recommended that residents be charged on an energy-use basis (instead of a weekly or monthly rate).
- Charge each PEV owner a fixed monthly rate.
- Install a submeter for the charging station and charge the PEV owner based on readings from the submeter. (This option is preferred by many building owners because it ensures full compensation for actual usage. Residents also usually consider it to be the most equitable arrangement.)

For building management. Consider installing a public charging station for the long-term benefits it offers.

Because the building pays for installation, a public charging station is more costly in the short term. But don't forget—DCEO will rebate up to 50% of the equipment and installation costs. Also, you don't need to adjust your building's parking arrangements to accommodate individual needs. You can just reserve a few PEV spaces near the public charging station and help your residents coordinate their charging schedules.

A public charging station can also serve as a powerful marketing tool in attracting new residents. And it can help your building meet several LEED and Green Parking Council certification requirements.

For residents. If you're a PEV owner—or considering becoming one—you might want to talk to your building owner or homeowners association about installing a public charging station.

If your building owner agrees to install a public PEV charging station, you'll need to discuss monthly payment options. Will the building cover the costs of electricity? Or will you?

A public charging station offers benefits to individual PEV owners. Not only does it take away the costs and headaches of installing your own PEV charging station for you, it might even inspire your neighbors to become PEV owners, too!



The average Chicago resident can save:
70%
in fuel costs

THIS IS GREAT! There are over **200,000** electric vehicles in the U.S. today!

HOW GREAT IS IT? In **ONE YEAR**, we...

saved 96 million gallons of petroleum.

that's enough petroleum drums to reach the moon 6.5 times!

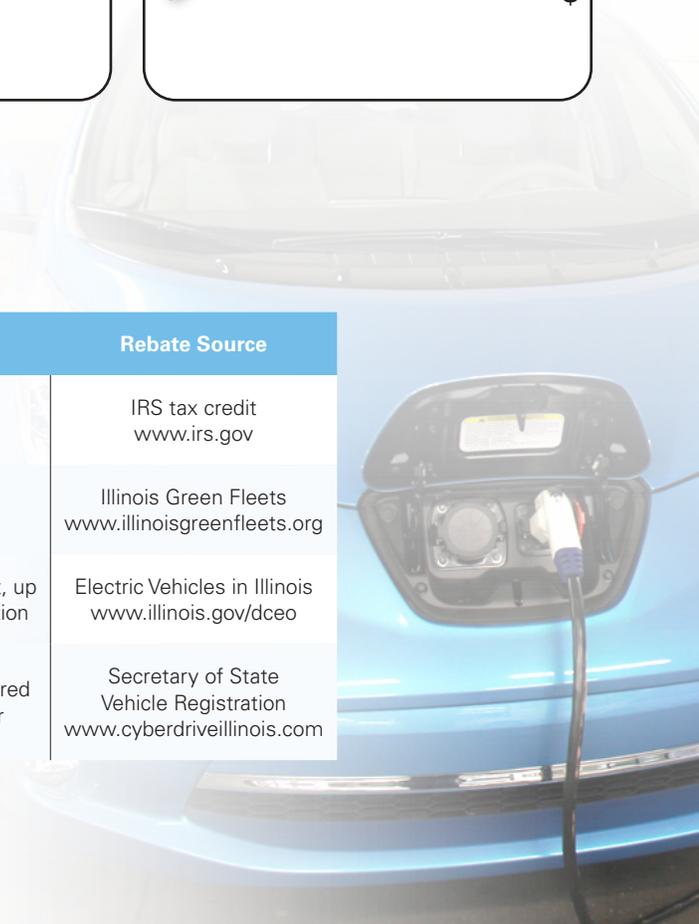
eliminated 353,000 tons of CO₂.

saved \$229 million in fuel costs.

Sources: www.insideevs.com/monthly-plug-in-sales-scorecard/
www.afdc.energy.gov/prep/
www.energy.gov/maps/egallon

There's plenty of financial help available

Government Entity	Incentive type	Benefit	Rebate Source
Federal government	Electric vehicle	\$2,500 to \$7,500 tax credit, depending on battery size	IRS tax credit www.irs.gov
State of Illinois	Electric vehicle	80% rebate up to \$4,000	Illinois Green Fleets www.illinoisgreenfleets.org
State of Illinois	Charging station	Rebate of 50% of installation cost, up to \$3,000 per nonnetworked station	Electric Vehicles in Illinois www.illinois.gov/dceo
State of Illinois	Electric vehicle registration fee	Discount to \$18 for PEVs (compared with \$99 for a conventional car)	Secretary of State Vehicle Registration www.cyberdriveillinois.com



FAQ

1. As a vehicle owner, how much can I expect to save on fuel by switching to a PEV?

Consider this hypothetical scenario: Fueling a conventional vehicle traveling 12,000 miles in a year (with gas at \$4 per gallon) would cost \$1,920. An all-electric car using Level 1 charging traveling the same distance (and charging off-peak at a rate of \$0.07 per kWh) would cost \$286 in electricity—for a savings of \$1,600 in a year.

2. How much does it cost to charge a PEV?

It depends on your building management. In some cases, you might be charged a monthly fee by the kWh, which can be a flat monthly rate based on electricity supply rates, no matter when you charge your vehicle. If your building management uses the real-time pricing option, which varies by the hour, you can save money if you charge at off-peak times.

In Chicago, ComEd offers real-time pricing for MUDs (as long as meters are in accessible locations.) Alternative electricity supplies do not offer real-time pricing, but offer highly competitive rates.

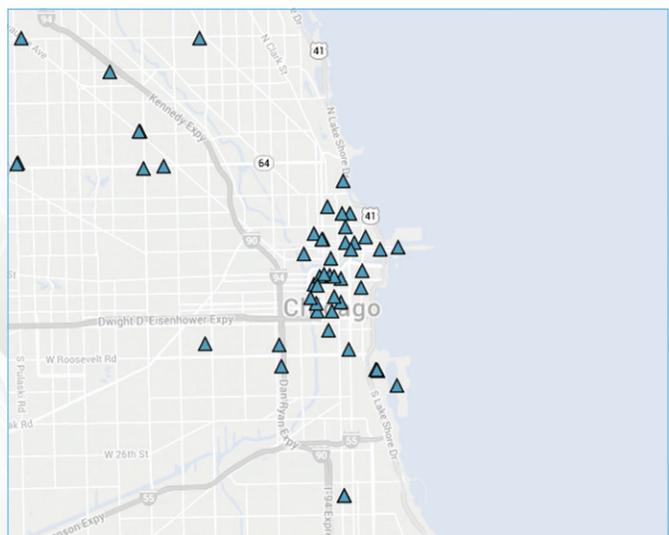
At an estimated annual electricity usage of 5548 kWh for Level 1 charging, is estimated to cost \$394 per year (flat rate) or \$205 to \$287 in real-time pricing.

For Level 2, with estimated annual electricity usage of 10,512 kWh, the flat rate is estimated to be \$782 or from \$502 to \$709 in real-time pricing.

3. What if building management does not want to work with PEV owners in making arrangements to charge their vehicles?

It's important, as adoption of PEVs in the Chicago area continues to grow, that building managers and residents work together to come up with charging solutions that are win-wins all around. That's what Drive Electric Chicago is all about.

In the event a mutually beneficial solution cannot be worked out, there are many workplace and public charging stations throughout the Chicago area. You can find a current map at www.chicagocleancities.org/resources/station-locator



Public charging station locations in Chicago

MORE INFORMATION

About Plug-in Electric Vehicles

Department of Energy Alternative Fuels Data Center
www.afdc.energy.gov/fuels/electricity.html; 800-254-6735

PEV Handbook for Consumers
www.afdc.energy.gov/pdfs/51226.pdf

American Lung Association of Illinois
www.driveelectricillinois.org

Environmental Law and Policy Center
www.pluginchicagometro.org

Chicago Area Clean Cities Coalition
www.chicagocleancities.org

PEV Station Locator

www.chicagocleancities.org/resources/station-locator

Savings Calculator

To calculate your personal savings by switching to a PEV, visit www.comed.com/technology/electric-vehicles/Pages/cost-calculator.aspx

IMPORTANT CONTACT INFORMATION

City of Chicago

Permits and Inspections
buildings@cityofchicago.org; 312-743-3600

Electrical Permits and Inspections
keith.hall@cityofchicago.org; 312-743-3622

Office of Sustainability
sustainability@cityofchicago.org

ComEd

Real-Time Pricing Program
www.rrtp.comed.com; 888-202-7787

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To learn more, visit us online at www.DriveElectricChicago.org and contact sustainability@cityofchicago.org with any questions.

