



# ELECTRIC VEHICLES AND THEIR ROLE IN REDUCING DURHAM'S GREENHOUSE GAS EMISSIONS

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Durham is a member of the Global Covenant of Mayors, the largest global alliance for city leadership focused on addressing climate change. As part of that commitment, the Town has adopted a Climate Action Plan (CAP) to reduce greenhouse gas emissions. The plan is organized into five focus areas, each specifying actions for reducing emissions and/or enhancing resilience to climate change.

In Durham, **92.7%** of Greenhouse Gas emissions come from the built environment and transportation, and one of the most significant actions in the CAP involves increasing the energy efficiency of homes and businesses while reducing our reliance on fossil fuels for heating and transportation. Achieving this depends on Durham's residents and businesses taking action.

This is the third in a series of articles in Durham's campaign to engage citizens in climate change action. We often consider electric vehicles (EVs) a no-brainer in our efforts to decarbonize our transportation system. Before purchasing an EV, however, one must consider the electricity prices in New Hampshire as well as the renewable energy content of our power sources. With an EV, smart consumers of electricity can significantly reduce their transportation costs and carbon footprint.

## Glossary

### 1 EV vs PHEV



An electric vehicle (EV) as a vehicle that runs solely on electricity and is powered by a battery that is charged by plugging the vehicle into an electric power source. A plug-in hybrid electric vehicle (PHEV), on the other hand, has both an electric motor and a gasoline engine. PHEVs can run on electricity alone for a certain distance before switching to gasoline power, while EVs rely solely on their battery power. Both types of vehicles are considered alternative fuel vehicles and can benefit from the deployment of EV charging infrastructure throughout New Hampshire.

### 2 What are I-93, I-95, and US 4 Highways?



I-93 and I-95 are both part of the Interstate system in New Hampshire. They carry more traffic than other routes, with portions of the Everett Turnpike in Nashua, I-93 in Salem, and most of I-95 along the southeastern border carrying more than 80,000 vehicles per day. On the other hand, US 4 is a federal highway that runs east-west across New Hampshire. It is not part of the Interstate system and likely carries less traffic than I-93 and I-95.

### 3 Level 1 vs Level 2 vs Level 3 Chargers



Level 1 charging uses a standard 120-volt AC household outlet and can provide up to 2 kW of power. This is the slowest type of charging and is best suited for overnight charging at home.

Level 2 charging uses a 240-volt AC electrical circuit and can provide up to 6 kW or higher of power, depending on the specific charger. Level 2 chargers are typically found in public locations such as parking garages, shopping centers, and workplaces.

Level 3 charging, also known as DC fast charging (DCFC), uses a high-powered DC electrical circuit and can provide up to at least 150 kW of power. DCFC chargers are designed for quick charging on the go and are typically found along major highways or in other high-traffic areas.

It's important to note that not all electric vehicles are compatible with all types of chargers, so it's important to check your vehicle's specifications before using a particular type of charger.

Source: NH DOT State Plan for Electric Vehicle Infrastructure Deployment, 2022



## Is an Electric Vehicle Right for You?

There are a number of factors to consider. EV sales have increased dramatically as consumers find that they can meet the vast majority of their daily needs with an electric vehicle. The battery range of popular electric vehicles is approaching 300 miles, and some models can travel over 400 miles on a single charge. A Type 2 EV charger can recharge the most popular EV models at home in four to eight hours. In your garage, your electric vehicle is quietly refuelling as you sleep.

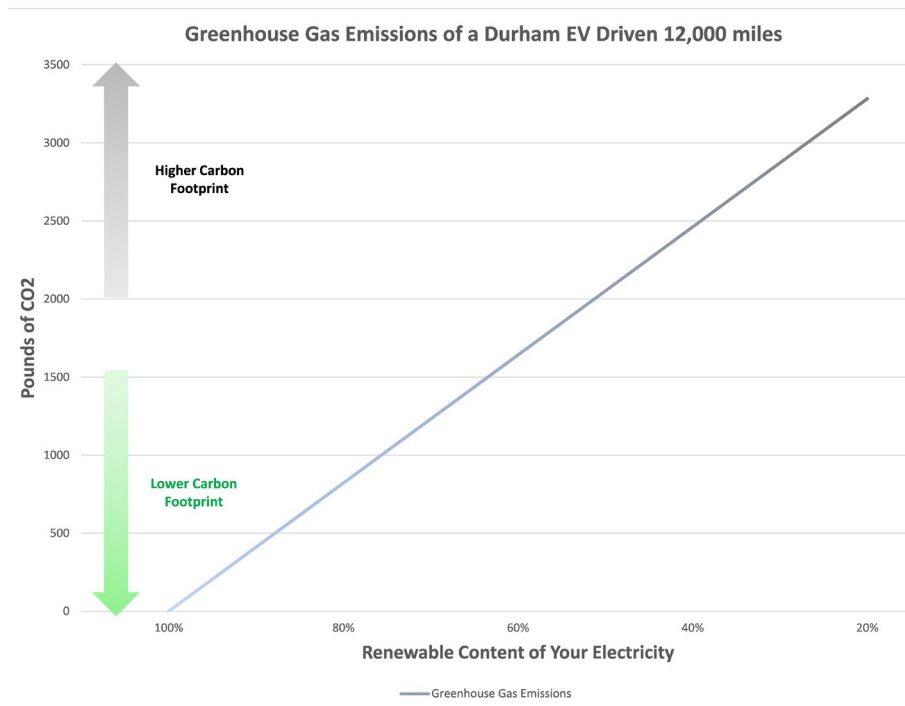
The Inflation Reduction Act (IRA) provides a tax credit for qualifying vehicles that meet specific requirements regarding assembly location and battery characteristics. New qualifying vehicles qualify for a credit of \$3,750 or \$7,000, depending on the vehicle, and household income limits apply. Pre-owned electric vehicles are also eligible for a credit of up to \$4,000. If you are considering a new or used electric vehicle, you should check the [website](#) to see if it is eligible for the IRA tax credit.

Whether an electric vehicle will meet your environmental and financial expectations depends on your choice of electricity provider, especially in New Hampshire. It's common to keep an eye on gas prices in the local area, and fill up at gas stations with competitive prices for a quality product. EV charging at home also requires that you be a smart consumer!

## NH has Options for Less Expensive Electricity from Renewable Sources for the Smart Consumer.

Electricity from Eversource is very expensive in New Hampshire, and the default supply emits one pound of greenhouse gases for every kilowatt hour of electricity consumed. Good news for EV owners in New Hampshire: there are competitive suppliers offering 100% renewable electricity that have the added bonus of costing substantially less than the default rates!

There have been competitive electric suppliers this spring offering electricity from 100% renewable sources at prices almost 30% lower than Eversource. As a result, EV owners using a 100% renewable source of electricity will reduce their energy costs and their carbon footprint by 3,200 pounds per year as compared with the default supply, which can make an EV a great choice. Whereas, for customers using the default energy supply, a hybrid vehicle would be less expensive to operate with a similar carbon footprint.





## ***Electric Vehicle Charging and the Plug-In Hybrid Option.***

It is possible to locate remote charging stations for your electric vehicle using a variety of resources and applications. As an alternative, if your requirements exceed the range of an EV, then a Plug-in Hybrid Vehicle (PHEV) may be a more suitable choice. Although PHEVs do not have the battery range of an EV, they can operate as hybrids when the battery is depleted. Many consumers find that a PHEV operating in EV mode meets the majority of their daily needs, and they only use the hybrid mode when traveling longer distances.

As with hybrid vehicles, PHEVs are more expensive to maintain since they use both internal combustion engines and electric motors. While EVs do not require oil changes or tune-ups, PHEVs do! In addition to being more expensive to operate in EV mode, PHEVs may also be less efficient in terms of electric mileage because of their weight and size. With those caveats: PHEVs can greatly reduce your carbon footprint if you choose the right electricity supplier that offers renewable energy at lower costs.

EV owners who regularly use their vehicles will need to invest in a Type 2 charger for their homes. Most EVs can be fully charged in four to eight hours with this charger when plugged into a dedicated 240V circuit. The installation of the charger may require new wiring to the electrical panel, as well as an upgrade of the panel based on its current load. As part of the Inflation Reduction Act, consumers are entitled to a 30% tax credit on the purchase and installation of a charger, up to a maximum of \$1,000.

Due to the smaller battery capacity of PHEVs, home Type 1 chargers are often sufficient for charging these vehicles. In most cases, the Type 1 charger is connected to a standard 110V outlet with a 15- or 20-amp breaker.

According to the New Hampshire Department of Transportation's (NHDOT) State Plan for Electric Vehicle Infrastructure Deployment [report](#), EV charging stations are essential for electric vehicle drivers to travel smoothly throughout New England. By providing a nationwide network of electric vehicle charging stations, the plan seeks to provide convenient charging for all.

A number of priority corridors have also been identified for EV charging station deployment, including I-93, I-95, and US 4. To provide electric vehicle drivers with fast and convenient charging options, the plan proposes the deployment of Level 3 DC fast chargers at strategic locations along these corridors. The State of NH will receive approximately \$17 million over the next five years for electric vehicle infrastructure development.

There is a wide range of fuel efficiencies in electric vehicle offerings, with some models achieving much higher efficiency ratings than others. The fuel efficiency of an electric vehicle depends on a variety of factors, including battery capacity, vehicle weight, and aerodynamics. Consumers can compare the fuel efficiency of different electric vehicles using resources such as the U.S. Department of Energy's Fuel Economy [website](#), which provides information on the estimated range and MPGe (miles per gallon equivalent) ratings for a wide range of electric vehicles. By comparing the fuel efficiency of different models, consumers can choose an electric vehicle that meets their needs and budget while also minimizing their environmental impact.



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## TO SUM IT ALL UP

While UNH and Durham are making concrete efforts to reduce their greenhouse gas emissions, whether or not we will achieve our reduction goals will largely depend on the decisions residents make regarding their homes and transportation.

As a result, the residents should support energy efficiency programs, such as [weatherizing their homes](#) and installing [heat pumps](#), which can reduce overall electricity usage and lower costs. Add to that, electric vehicles are also an important part of our efforts to meet our goals, since their overall carbon footprint, including manufacturing, is less than that of their fossil fuel counterparts.

When you switch from a vehicle that gets 35 miles per gallon to an electric vehicle that gets 3.9 miles per kilowatt-hour, you will reduce your greenhouse gas emissions by over 6,500 pounds per year. Residents, however, should also be educated consumers and seek out readily available renewable sources of electricity that are less expensive. A list of approved suppliers may be found on the [website](#) of the New Hampshire Public Utilities Commission.