

Vehicle Buyer's Guide

An introduction to vehicle technologies

This guide provides a more detailed **introduction to the vehicle technologies** we will refer to in the next section of the survey (Section E).

Please review this information carefully, even if you feel you are already familiar with some of the details. We want to be clear about the terms we use in the survey.

Purpose of this guide

This guide summarizes vehicles that can be powered by gasoline only, electricity only, and both electricity and gasoline. In particular, this guide focuses on **how these vehicles are powered and are recharged**.

In Section E, you will be asked to share your thoughts on these vehicle technologies. You will also complete **"choice exercises"** where you tell us **which vehicle would be ideal for you**.

Contents

This guide contains the following sections:

1. Vehicle technologies
2. Vehicle features
3. Commonly asked questions
4. Getting ready for Section E



If there are any aspects of this information that you do not understand, *don't worry* – further explanation will be available during the rest of the survey.

1. Vehicle technologies

The goal of this guide is to help you understand **how the following vehicle technologies differ**. They can either be **recharged, refueled, or both**.

While reading about these vehicle technologies, please consider the advantages and drawbacks in relation to **your personal needs and desires**.

The four vehicle technologies you will encounter in Section E of the survey are:



Conventional gasoline vehicle: uses only gasoline as its fuel.



Hybrid vehicle: also uses only gasoline as its fuel. It also has a small battery (charged internally) and electric motor to reduce its fuel consumption. This type of vehicle **cannot be plugged in to recharge** its small battery.







Plug-in hybrid vehicle: uses gasoline and electricity - it has both a gasoline engine **and** a battery. Its **battery can be plugged in to recharge**. While driving, the vehicle can be powered by gasoline only, electricity only, or both. If the battery runs out, it can still drive using gasoline.



Battery electric vehicle: uses **only** electricity. It must be plugged in to recharge its battery.

The following table illustrates the differences among these four vehicle technologies:

	Refuel with Gasoline	Recharge with Electricity
Conventional Gasoline 	<input checked="" type="checkbox"/>	
Hybrid 	<input checked="" type="checkbox"/>	
Plug-in Hybrid 	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Battery Electric 		<input checked="" type="checkbox"/>

2. Vehicle features

This section describes **key features** of the vehicle technologies: **gasoline use**, **driving range**, **home recharging**, and **destination recharging**. As you read this section, please think about how these features are (or are not) compatible with your everyday life.

GASOLINE USE

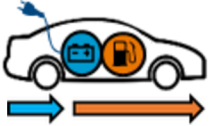
- Conventional gasoline vehicles, hybrid vehicles, and plug-in hybrid vehicles can be refueled and powered by gasoline.
- Compared to a conventional gasoline vehicle, **hybrids and plug-in hybrids use less gasoline**, resulting in increased fuel efficiency and reduced fuel costs.

DRIVING RANGE

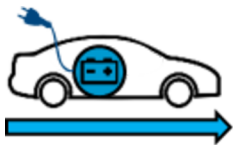
The driving range of vehicles depends on the specific vehicle technology:



The driving range of **conventional gasoline vehicles** and **hybrid vehicles** is the distance the car can travel on a single, **full tank of gasoline**.



















The driving range of **plug-in hybrid vehicles** includes the distance the car can travel on a **full tank of gasoline plus the range of its fully charged battery**.



The driving range (or battery range) of **battery electric vehicles** is the distance the vehicle can travel on a **fully charged battery**.

The picture below compares some examples of the driving ranges of conventional gasoline, hybrid, plug-in hybrid, and battery electric vehicles:

Vehicle	Driving Range	Description
	 Gasoline range  Battery range	
Conventional Gasoline 	750 km gasoline range 	An average conventional gasoline vehicle can drive about 750 kilometres on one tank of gas.
Hybrid 	950 km gasoline range 	A hybrid can travel further on one tank of gas compared to a conventional gasoline vehicle because it is more fuel efficient.
Plug-in Hybrid 	60 km battery range, then switches to gas  	Plug-in hybrids can run on electricity for a specified range, which depends on the battery size. Once the battery is depleted, the vehicle can run on gasoline. The total driving range is similar to that of a hybrid vehicle.
Plug-in Hybrid 	90 km battery range, then switches to gas  	
Battery Electric 	350 km battery range 	Battery electric vehicles run only on battery power. The driving range of an electric vehicle varies by the size of the battery.
Battery Electric 	500 km battery range 	

HOME RECHARGING

You may be able to **charge plug-in hybrid and battery electric vehicles at home** if you have regular access to a parking spot that is close to an electrical outlet. The charging time depends on the vehicle's battery size and whether you can access a **normal outlet** (120-volt charging) or a **home recharge station** (240-volt charging).

Normal outlet (120-volt)

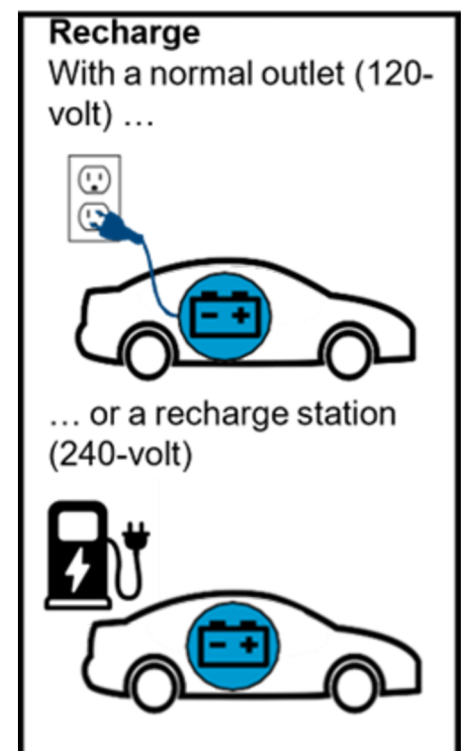
Normal electrical outlets (120-volt) are the same type you may use to charge your cell phone or laptop. You may find such an outlet in your home garage, on the side of your house, or in your parking lot.

The time required to charge a battery with a normal outlet **depends on the battery size**. For example, it may take around 10 hours to charge a plug-in hybrid with a 60 km range battery, and up to 60 hours to charge a battery electric vehicle with a 350 km range battery.

Recharge station (240-volt)

A **recharge station** is a charger specifically designed for charging plug-in hybrid and electric vehicles. **It requires installation near a parking spot, using a 240-volt outlet** (the kind a dryer plugs into).

A recharge station can recharge a vehicle **up to six times faster** than a normal outlet (120-volt). For example, it may take around 1.5 hours to charge a plug-in hybrid with a 60 km range battery, and up to 10 hours to charge a battery electric vehicle with a 350 km range battery. For this reason, many drivers choose to **install a recharge station at home**.



RECHARGING OUTSIDE OF THE HOME

Plug-in hybrid and battery electric vehicles can also be recharged in public areas outside of your home. Two options are **“street chargers”** and **“destination chargers”**:

Street chargers are recharge stations located alongside street parking spots and may be commonly located in residential areas in the future.



Destination chargers include recharge stations in various parking lots, such as shopping centres, recreation centres, grocery stores, and schools or universities.



You may have noticed some of these recharge stations in areas where you typically park. Your **workplace** may also have a recharge station.

Street and destination recharge stations are **similar to home recharge stations (240-volt)**, which are **up to six times faster** than normal outlets (120-volt). Some of these destination recharge stations could be free to use, and some require drivers to pay a user fee or join a service to use the station.

Fast chargers

Another type of public charger is the so-called **“fast charger”**. These can recharge an almost-empty battery in about 30 minutes.

In the future, fast chargers may be located at regular intervals **along major highways and travel routes** to allow drivers to quickly recharge their electric vehicles when traveling long distances.



VEHICLE SUMMARY

The picture below presents key information for each **vehicle technology**.

Note that **recharge time depends on the battery size and type of charger**, and refers to the time it takes to recharge an empty battery. However, drivers usually do not fully deplete their vehicle batteries.

Vehicle	Driving Range	Refuel Time	Electric Recharge Time		
			Normal outlet (120-volt)	Recharge station (240-volt)	Fast charger
Conventional Gasoline	750 km gasoline range	Gas 5 mins			
Hybrid	950 km gasoline range	Gas 5 mins			
Plug-in Hybrid	60 km battery range, then switches to gas	Gas 5 mins	10 hours	1.5 hours	
Plug-in Hybrid	90 km battery range, then switches to gas	Gas 5 mins	15 hours	2.5 hours	
Battery Electric	350 km battery range		60 hours	10 hours	30 min
Battery Electric	500 km battery range		85 hours	14 hours	1 hour

3. Commonly asked questions

1. How long does it take to recharge a plug-in hybrid or battery electric vehicle?

Recharging time depends on **vehicle size and battery range**, as well as the **type of charger**. Vehicles with a longer driving range need larger batteries and take longer to recharge. Recharge stations (240-volt) are faster than normal outlets (120-volt). Fast chargers require the least time to recharge batteries.

2. Can I partially charge the battery?

Yes. Just like refuelling a gas tank, **you can recharge your battery part way** if you wish.

3. How do I know if I can install a recharge station at home?

To install a charger at home, **you need access to a 240-volt outlet** (the kind a dryer plugs into) within about 50 feet (15 meters) of your parking spot.

You also need the **authority to install a recharge station** into this existing outlet. For example, if you do *not* own the home, you likely need permission from the owner to install the charger. If you live in an apartment or townhouse, you may need permission from a strata council or building manager.

Alternatively, you can also recharge your vehicle at home using a **normal outlet** (120-volt), if there is one close to where you park. Recharging your vehicle using a normal outlet (120-volt) **does not** require the installation of a recharge station.

4. What if I don't have access to home recharging? Is it feasible to charge a plug-in hybrid or battery electric vehicle outside of home?

Some people own and drive electric vehicles without having access to home recharging. The possibilities for public recharging vary by area. You can charge your vehicle **at your workplace** if there is a recharge station there. You can use **street chargers** alongside curbside parking spots if these are available near your home, or **destination chargers at your regular destinations**, such as shopping centres or schools. Each year, more and more public chargers are being installed in most regions.

5. What are some advantages of driving with electricity compared to gasoline?

It depends on your priorities and interests. **Electricity is generally cheaper than gasoline**, costing roughly 65% to 80% less per kilometre in Canada (at average gas and electricity prices in 2021). Driving with electricity also tends to **produce less air pollution and greenhouse gas emissions** than driving with gasoline – even including emissions from electric power plants. The size of these reductions depends on the electricity source (e.g., coal- vs. wind-generated electricity).

4. Getting ready for Section E

The next survey section asks you about your interests in the vehicle technologies introduced in this guide.

In Section E, you will **complete six choice exercises**. You will be presented with **different versions of the make and model** of your next vehicle purchase/lease that you told us about earlier in the survey.

These versions of your next vehicle will **vary according to the following features**:

1. VEHICLE TYPE:



The four different **vehicle technologies** presented in this guide: Conventional gasoline, Hybrid, Plug-in hybrid, and Battery electric.

2. DRIVING RANGE:



The **number of kilometres** the vehicle can drive on a fully charged battery or full tank of gasoline. For example, a battery electric vehicle may have a 350 km battery range.

3. HOME RECHARGING TIME:



The ability and time required (in hours) to fully **charge a plug-in hybrid or battery electric vehicle at your home**. This time will vary depending on the vehicle's battery size and whether you have access to a normal outlet (120-volt), which is slower, or a recharge station (240-volt), which is up to six times faster.

4. WORKPLACE RECHARGING TIME:



The ability and time required (in hours) to fully **charge a plug-in hybrid or battery electric vehicle at your workplace**.

5. STREET RECHARGING ACCESS:



The availability of **recharge stations (240-volt) at curbside street parking spaces** near your home.

6. DESTINATION RECHARGING ACCESS:



The **proportion of destinations that you regularly drive to** (for example, 1 in 10) **that have recharge stations (240-volt)** available for plug-in hybrid and battery electric vehicles.

7. FAST CHARGING AVAILABILITY:



The **availability of fast chargers** for plug-in hybrid and battery electric vehicles **at regular intervals along major highways**. Fast chargers can recharge an almost-empty battery in about 30 minutes, depending on the size of the battery.

8. FUEL COST:



The **weekly cost of fuel or electricity for each vehicle type**. For example, the weekly cost of electricity needed to recharge an electric vehicle. *This feature will vary depending on your stated expected fuel costs.*

9. PURCHASE PRICE:



The **purchase price** of your stated next vehicle purchase **for each vehicle type**: Conventional gasoline, Hybrid, Plug-in hybrid, and Battery electric.

10. GOVERNMENT INCENTIVE:



A government-funded **incentive is subtracted from the purchase price, where available**. For example, government incentives may be available for plug-in hybrid and battery electric vehicles.

Your vehicle choice:

In each choice exercise, you will be asked to **choose which version of your next vehicle purchase/lease you most prefer**. Please carefully consider **your vehicle preferences, driving needs, and budget**. Assume that the vehicles are all the same (e.g., with respect to performance, comfort, and style), other than the features presented.





For the purposes of the survey, please assume that your next vehicle is available for sale in each of the four vehicle technologies.

For example, you may see a **choice exercise that looks like this**:

You will see 6 choice sets in total. With each new choice set, the values in the table will change.

The vehicle technologies: these are explained in full in your Vehicle Buyer's Guide.

Vehicle Choice Set 1 of 6

Vehicle type	 Conventional Honda CIVIC	 Hybrid Honda CIVIC	 Plug-in hybrid Honda CIVIC	 Electric Only Honda CIVIC
Range	→ 650 km gasoline	→ 1050 km gasoline	20 km electric 980 km gasoline	200 km electric
Recharge/ refuel time	5 min.	5 min.	Home: 6 hours Work: Not available	Home: 6 hours Work: Not available
Street recharging access	–	–	Available 1 block from home	Available 1 block from home
Destination recharging access	–	–	1 in 5 destinations	1 in 5 destinations
Fast charging availability	–	–	None	None
Fuel cost	\$32 /week	\$20 /week	\$18 /week	\$10 /week
Purchase price & incentive	\$25,000 – \$0 \$25,000	\$26,380 – \$0 \$26,380	\$30,180 – \$5,000 \$25,180	\$38,820 – \$5,000 \$33,820
I CHOOSE:	Conventional <input type="radio"/>	Hybrid <input type="radio"/>	Plug-in Hybrid <input type="radio"/>	Electric <input type="radio"/>

- The vehicle features will change every time you see this table.
- The vehicle features are explained in your Vehicle Buyer's Guide.

Next

To revisit your Vehicle Buyer's Guide, simply click on the link here at any time during the choice sets.

[Click HERE to access the Vehicle Buyer's Guide](#)

You must make a choice in order to move to the next choice set.

Please select the vehicle you would be most likely to buy or lease given the options presented.

To select a vehicle, click the circle in the "I CHOOSE" row.