EPRI ELECTRIC POWER RESEARCH INSTITUTE

CONSUMER GUIDE TO ELECTRIC VEHICLES

MARCH 2019

Today's Choices in Cars

Today's electric car market is growing steadily, offering U.S. consumers more affordable, efficient, high-performance transportation options each year. Buyers can find an electric car in almost every vehicle class, with about 41 new models available today and about 132 projected by 2022.

Nationwide, a public charging network is expanding as well, enabling more consumers to consider purchasing an electric car. Most drivers still prefer to charge at home, however, due to convenience and savings over time. They plug in and charge their cars overnight, just like their smart phones. At the U.S. national average price of 12.5 cents per kilowatt-hour (kWh), electricity is roughly equivalent to gasoline at $1 a gallon. Plus, many electricity providers offer special electric vehicle rates.

Displacing gasoline with domestic electricity cuts petroleum use and emissions, which benefits public health. Electrifying the transportation sector can reduce greenhouse gas emissions in 2050 by 57% relative to 2015 levels.

Consider your driving needs. An electric vehicle might work for you.

ELECTRIC VEHICLES DEMYSTIFIED

This guide focuses exclusively on plug-in electric vehicles, which have batteries that are recharged by plugging into the electricity grid. There are two main types: battery electric or all-electric vehicles, and plug-in hybrid electric vehicles.

All-electric vehicles use no gasoline and are powered solely by an electric motor (or motors) and battery. Battery technology is rapidly advancing, costs are declining, and vehicle range is increasing.

Plug-in hybrids are powered by an electric motor (or motors) and battery paired with an internal combustion engine. Most drive solely on electricity using battery energy until the battery is discharged, thereafter continuing to drive on gasoline like a conventional hybrid.

Conventional hybrids have smaller batteries and do not plug in. These hybrids, and cars with technologies designed to maximize gasoline fuel economy such as start-stop or mild hybrids, have electrified drivetrains but are not electric vehicles that can travel on electric power alone.

ELECTRIC VEHICLE AVAILABILITY

The new-car market is transforming. Although electric cars today comprise a fraction—roughly 2%—of U.S. light-duty vehicle sales, the market is projected to grow due to a global shift toward vehicle electrification. U.S. sales of new electric cars increased by 81% in 2018 over 2017. Cumulative sales topped 1 million nationwide and 4 million globally.

Today, U.S. consumers can buy an electric car in almost every vehicle class, as shown in Figure 1. Automakers are offering more choices in trim levels and body styles. Some offer different powertrains—gasoline, battery electric and plug-in hybrid—for the same car.

Some electric vehicle models are available nationwide. Some are available only in California and states that have adopted zero emission vehicle (ZEV) regulations. Still others can be ordered online from the manufacturer and delivered through a local dealer, even if that dealer is in a non-ZEV state or does not stock electric cars on the lot.

Used electric cars are also available. As people who bought the first generation of electric vehicles trade up to new models, their previous cars are now for sale in the used-car market as affordable electric vehicle options.

In addition, several ultra-luxury or limited-edition models priced over $150,000 are available. They are listed in Table 2 on page 15 but not featured with photos on the following pages of this guide.

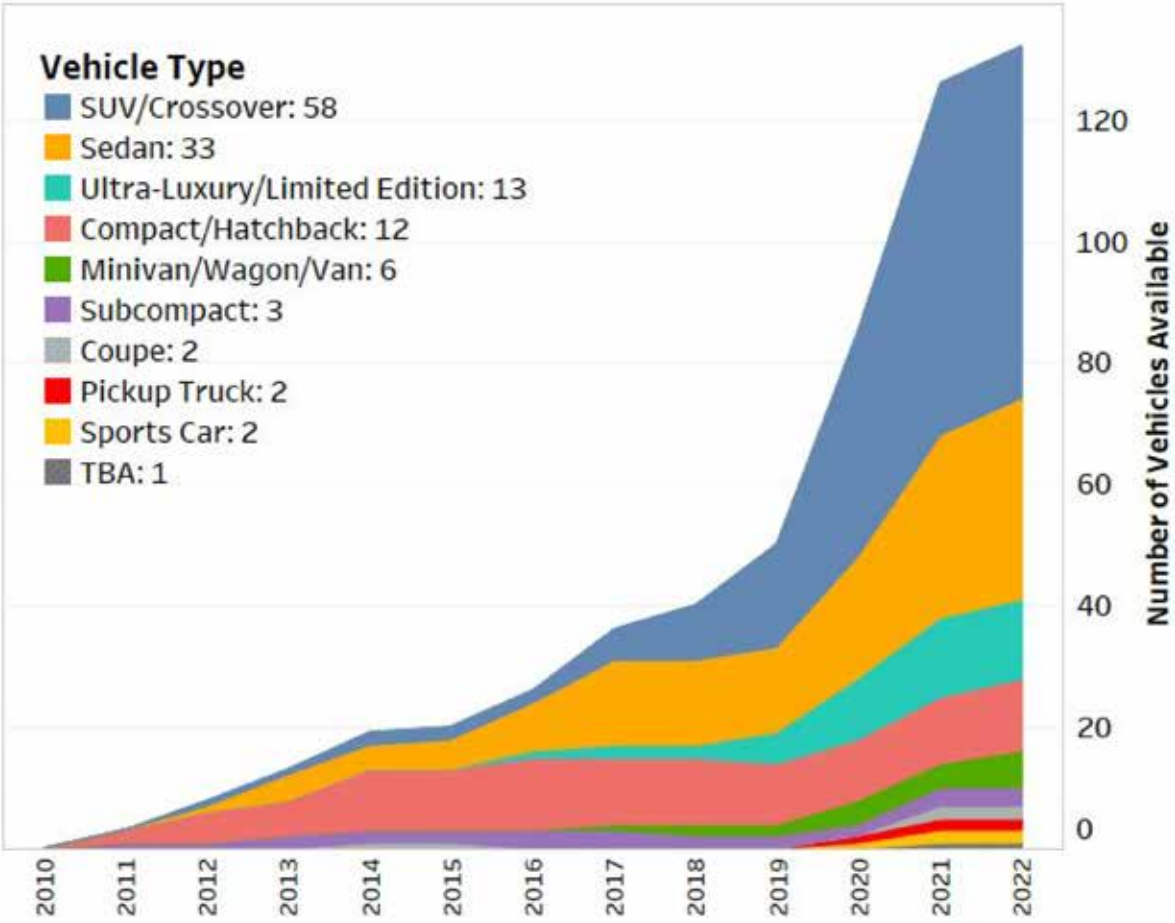

Figure 1 – The number and variety of electric vehicle models continues to grow. By the end of 2019, about 58 different models are expected to be available in the United States. By 2022, around 132 models are projected.

ELECTRIC VEHICLE RANGE AND CHARGING

Most current battery electric vehicles can drive 120 to 250 miles on a charge, and some can travel even further. A recent analysis by EPRI shows that, by 2022, the average range of all-electric vehicles will increase from 196 to 264 miles. With battery technology improving and costs declining, some models with even longer range, 300 miles or more, are expected.

Today's plug-in hybrids can travel 10 to 50 miles on electricity alone, followed by another 300 to 550 miles on gasoline. Some designs allow the driver to choose when to use electricity or gasoline. If you charge every day, you may be able to drive 1,000 to 2,000 miles between gasoline fill-ups.

Most drivers find it convenient and cost-effective to charge at home. Every electric car comes with a 120VAC charging cord (Level 1) that plugs into a standard household outlet. Charging at Level 1 delivers roughly three to five miles of range for every hour of charging.

For faster charging, a 240VAC charging station (Level 2) delivers roughly 12 to 25 miles of range per hour of charging depending on the type of electric vehicle and its onboard charger. Some automakers include free Level 2 charging equipment with the sale or lease of a long-range all-electric car. Most offer it as part of a package with an authorized third-party charging station and service provider to create a turnkey home-charging solution. Some consumers opt to buy a Level 2 station from a different provider, independent of their car purchase.

Public and workplace charging networks with Level 1, Level 2, and DC fast charging options are expanding nationwide. A DC fast charger can charge a properly equipped battery electric vehicle to 80% full in roughly 20 to 40 minutes (20 minutes for shorter range cars and 30 to 40 minutes or more for longer range cars with bigger battery packs).

Many, but not all, electric vehicles are equipped to accept DC fast charging. Among those that are fast-charging capable, the speed at which they can charge varies. Furthermore, the speed of individual DC fast charging stations varies by installation, ranging from 50kW to 125kW, with Tesla Superchargers among the fastest.

Table 1 highlights charging basics. The amount of range replenished per hour of charging may vary beyond the numbers shown. For more information, see EPRI publication, "A U.S. Consumer's Guide to Electric Vehicle Charging" (Product ID 3002009442). An updated charging guide will be published in 2019.

Level 1 delivers roughly three to five miles of range for every hour of charging.

Level 2 delivers roughly 12 to 25 miles of range per hour of charging depending on the type of electric vehicle and its onboard charger.

DC fast charging can charge a properly equipped battery electric vehicle to 80% full in 20 to 40 minutes.

Table 1 – Charging basics

Level	Circuit Capacity/Description	Location	Miles Range/ Hour Charging	Overnight Charging Range[1]
Level 1	Dedicated 110–120VAC, 15–20A circuit; three-prong outlet; charging cable comes with car; or charging station.	Home/Work/Public	3–5 miles	30–50 miles
Level 2	Dedicated 240VAC, 30–100A circuit; charging station.	Home/Work/Public	12–25 miles	120–250 miles
DC Fast Charging	Dedicated 480–600VDC, up to 300A circuit; charging station.	Public	80% charge in 20–40 minutes	Not applicable

[1] *Assumes 10 hours of charging time.*

Available Nationwide

The following pages highlight electric cars that are available nationwide as of March 30, 2019. Sources for vehicle range are U.S. EPA and automakers. For battery electric vehicles, range per hour of charging assumes a Level 2 charging station. Fast charging times are provided by automakers or calculated from automaker statements and are listed for vehicles that are fast-charging capable. For plug-in hybrids, range per hour of charging is calculated from U.S. EPA data and includes both Level 1 (the smaller number) and Level 2 (the larger number). All range per hour and fast charging numbers are approximate.

2019 Audi e-tron

Photo courtesy of Audi

Type:	Battery electric vehicle; SUV/Crossover
Estimated electric range:	220 miles
Range/hour of charging:	24 miles
Fast charging:	160 miles in 30 minutes

2019 BMW 530e and 530e xDrive iPerformance

Photo courtesy of BMW

Type:	Plug-in hybrid; Sedan
EPA electric range:	16 (15 for xDrive)
EPA total range (gas + electric):	370 (360 for xDrive)
Range/hour of charging:	2–8 miles

2019 BMW 740e xDrive iPerformance

Photo courtesy of BMW

Type:	Plug-in hybrid; Sedan
EPA electric range:	14 miles
EPA total range (gas + electric):	340 miles
Range/hour of charging:	2–5 miles

2019 BMW i3

Photo courtesy of BMW

Type:	Battery electric vehicle; Compact/Hatchback
EPA electric range:	153 miles
Range/hour of charging:	26 miles
Fast charging:	120 miles in 40 minutes

2019 BMW i3 REx

Photo courtesy of BMW

Type:	Plug-in hybrid; Compact/Hatchback
EPA electric range:	126 miles
EPA total range (gas + electric):	200 miles
Range/hour of charging:	26 miles
Fast charging:	100 miles in 40 minutes

2019 Chevrolet Bolt EV

Photo courtesy of Chevrolet

Type:	Battery electric vehicle; Compact/Hatchback
EPA electric range:	238 miles
Range/hour of charging:	25 miles
Fast charging:	90 miles in 30 minutes

2019 Chrysler Pacifica Hybrid

Photo courtesy of Chrysler

Type:	Plug-in hybrid; Minivan/Wagon/Van
EPA electric range:	32 miles
EPA total range (gas + electric):	520 miles
Range/hour of charging:	2–16 miles

2019 Ford Fusion Energi

Photo courtesy of Ford

Type:	Plug-in hybrid; Sedan
EPA electric range:	26 miles
EPA total range (gas + electric):	610 miles
Range/hour of charging:	4–12 miles

2019 Honda Clarity Plug-in Hybrid

Photo courtesy of Honda

Type:	Plug-in hybrid; Sedan
EPA electric range:	47 miles
EPA total range (gas + electric):	340 miles
Range/hour of charging:	4–19 miles

2019 Hyundai Ioniq Plug-in Hybrid

Photo courtesy of Hyundai

Type:	Plug-in hybrid; Compact/Hatchback
EPA electric range:	29 miles
EPA total range (gas + electric):	630 miles
Range/hour of charging:	3–13 miles

2019 Hyundai Sonata Plug-in Hybrid

Photo courtesy of Hyundai

Type:	Plug-in hybrid; Sedan
EPA electric range:	28 miles
EPA total range (gas + electric):	600 miles
Range/hour of charging:	3–10 miles

2019 Jaguar I-PACE

Photo courtesy of Jaguar

Type:	Battery electric vehicle; SUV/Crossover
EPA electric range:	234 miles
Range/hour of charging:	18 miles
Fast charging:	180 miles in 40 minutes

2019 Kia Niro Plug-in Hybrid

Photo courtesy of Kia

Type:	Plug-in hybrid; SUV/Crossover
EPA electric range:	26 miles
EPA total range (gas + electric):	560 miles
Range/hour of charging:	3–11 miles

2019 MINI Countryman Plug-in Hybrid

Photo courtesy of BMW

Type:	Plug-in hybrid; SUV/Crossover
EPA electric range:	12 miles
EPA total range (gas + electric):	270 miles
Range/hour of charging:	2–4 miles

2019 Mitsubishi Outlander Plug-in Hybrid

Photo courtesy of Hyundai

Type:	Plug-in hybrid; SUV/Crossover
EPA electric range:	22 miles
EPA total range (gas + electric):	310 miles
Range/hour of charging:	3–7 miles
Fast charging:	18 miles in 25 minutes

2019 Nissan LEAF and LEAF PLUS

Photo courtesy of Nissan

Type:	Battery electric vehicle; Compact/Hatchback
EPA electric range:	150 miles (226 miles LEAF PLUS)
Range/hour of charging:	19 miles
Fast charging:	120 miles in 40 minutes (LEAF)
	180 miles in 60 minutes (LEAF PLUS)

2019 Porsche Cayenne E-Hybrid

Photo courtesy of Porsche

Type:	Plug-in hybrid; SUV/Crossover
EPA electric range:	14 miles
EPA total range (gas + electric):	490 miles
Range/hour of charging:	1–5 miles

2019 Porsche Panamera 4 E-Hybrid

Photo courtesy of Porsche

Type:	Plug-in hybrid; Sedan
EPA electric range:	16 miles
EPA total range (gas + electric):	480 miles
Range/hour of charging:	1–5 miles

2019 Porsche Panamera 4 E-Hybrid Sport Turismo

Photo courtesy of Porsche

Type:	Plug-in hybrid; Minivan/Wagon/Van
EPA electric range:	16 miles
EPA total range (gas + electric):	480 miles
Range/hour of charging:	1–5 miles

2019 smart EQ fortwo

Photo courtesy of Mercedes-Benz

Type:	Battery electric vehicle; Subcompact
EPA electric range:	58 miles
Range/hour of charging:	19 miles
Fast charging:	Not equipped

Tesla Model 3

Photo courtesy of Tesla

Type:	Battery electric vehicle; Sedan
EPA electric range:	264–310 miles
Range/hour of charging:	37 miles
Fast charging:	150–170 miles in 30 minutes

Tesla Model S

Photo courtesy of Tesla

Type:	Battery electric vehicle; Sedan
EPA electric range:	315–335 miles
Range/hour of charging:	Up to 60 miles
Fast charging:	150–160 miles in 30 minutes

Tesla Model X

Photo courtesy of Tesla

Type:	Battery electric vehicle; SUV/Crossover
EPA electric range:	289–295 miles
Range/hour of charging:	Up to 60 miles
Fast charging:	140 miles in 30 minutes

2019 Toyota Prius Prime

Photo courtesy of Toyota

Type:	Plug-in hybrid; Compact/Hatchback
EPA electric range:	25 miles
EPA total range (gas + electric):	640 miles
Range/hour of charging:	5–12 miles

2019 Volvo S90 T8 eAWD

Photo courtesy of Volvo

Type:	Plug-in hybrid; Sedan
EPA electric range:	21 miles
EPA total range (gas + electric):	490 miles
Range/hour of charging:	2–7 miles

2019 Volvo XC60 T8 eAWD

Photo courtesy of Volvo

Type:	Plug-in hybrid; SUV/Crossover
EPA electric range:	17 miles
EPA total range (gas + electric):	500 miles
Range/hour of charging:	2–6 miles

2019 Volvo XC90 T8 eAWD

Photo courtesy of Volvo

Type:	Plug-in hybrid; SUV/Crossover
EPA electric range:	17 miles
EPA total range (gas + electric):	490 miles
Range/hour of charging:	2–6 miles

Available in Select Markets

The following pages highlight electric cars that are available in select markets as of March 30, 2019. Sources for vehicle range are U.S. EPA and automakers. For battery electric vehicles, range per hour of charging assumes a Level 2 charging station. Fast charging times are provided by automakers or calculated from automaker statements and are listed for vehicles that are fast-charging capable. For plug-in hybrids, range per hour of charging is calculated from U.S. EPA data and includes both Level 1 (the smaller number) and Level 2 (the larger number). All range per hour and fast charging numbers are approximate.

2019 Fiat 500e

Photo courtesy of Fiat

Type:	Battery electric vehicle; Subcompact
EPA electric range:	84 miles
Range/hour of charging:	21 miles
Fast charging:	Not equipped

2019 Honda Clarity Electric

Photo courtesy of Honda

Type:	Battery electric vehicle; Sedan
EPA electric range:	89 miles
Range/hour of charging:	25 miles
Fast charging:	70 miles in 30 minutes

2019 Hyundai Ioniq Electric

Photo courtesy of Hyundai

Type:	Battery electric vehicle; Compact/Hatchback
EPA electric range:	124 miles
Range/hour of charging:	31 miles
Fast charging:	90 miles in 23–33 minutes

2019 Hyundai Kona Electric

Photo courtesy of Hyundai

Type:	Battery electric vehicle; SUV/Crossover
EPA electric range:	258 miles
Range/hour of charging:	27 miles
Fast charging:	200 miles in 54–75 minutes

2019 Kia Niro EV

Photo courtesy of Kia

Type:	Battery electric vehicle; SUV/Crossover
EPA electric range:	239 miles
Range/hour of charging:	25 miles
Fast charging:	100 miles in 30 minutes

2019 Kia Optima Plug-in Hybrid

Photo courtesy of Kia

Type:	Plug-in hybrid; Sedan
EPA electric range:	29 miles
EPA total range (gas + electric):	610 miles
Range/hour of charging:	3–11 miles

2019 Kia Soul EV

Photo courtesy of Kia

Type:	Battery electric vehicle; Compact/Hatchback
EPA electric range:	111 miles
Range/hour of charging:	22 miles
Fast charging:	80 miles in 30 minutes

2019 Mercedes-Benz GLC 350e 4MATIC

Photo courtesy of Mercedes-Benz

Type:	Plug-in Hybrid; SUV/Crossover
EPA electric range:	10 miles
EPA total range (gas + electric):	350 miles
Range/hour of charging:	1–5 miles

2019 Subaru Crosstrek Hybrid

Photo courtesy of Subaru

Type:	Plug-in hybrid; SUV/Crossover
EPA electric range:	17 miles
EPA total range (gas + electric):	480 miles
Range/hour of charging:	2–8 miles

2019 Volkswagen e-Golf

Photo courtesy of Volkswagen

Type:	Battery electric vehicle; Compact/Hatchback
EPA electric range:	125 miles
Range/hour of charging:	21 miles
Fast charging:	100 miles in 60 minutes

Availability at a Glance

Table 2 – U.S. Electric Vehicle Availability

AVAILABLE NOW

BATTERY ELECTRIC VEHICLE

MODEL NAME	RANGE (MI)[1]	WHERE
SUV/CROSSOVER		
Audi e-tron	220	Nationwide
Jaguar I-PACE	234	Nationwide
Tesla Model X	289 – 295	Nationwide
Hyundai Kona Electric	258	Select Markets
Kia Niro EV	239	Select Markets
COMPACT/HATCHBACK		
BMW i3	153	Nationwide
Chevrolet Bolt EV	238	Nationwide
Nissan LEAF and LEAF PLUS	150 and 226	Nationwide
Hyundai Ioniq Electric	124	Select Markets
Kia Soul EV	111	Select Markets
Volkswagen e-Golf	125	Select Markets
SEDAN		
Tesla Model 3	264 – 310	Nationwide
Tesla Model S	315 – 335	Nationwide
Honda Clarity Electric	89	Select Markets
SUBCOMPACT		
smart EQ fortwo	58	Nationwide
Fiat 500e	84	Select Markets

[1] *Range: For battery electric vehicles is all-electric range. For plug-in hybrids is all-electric/combined (electric + gas) range. Sources for vehicles available now: www.fueleconomy.gov and manufacturer websites. Sources for vehicles expected in 2019: manufacturer and industry news websites, data subject to change.*

PLUG-IN HYBRID

MODEL NAME	RANGE (MI)[1]	WHERE
SUV/CROSSOVER		
Kia Niro Plug-in Hybrid	26/560	Nationwide
MINI Countryman Plug-in Hybrid	12/270	Nationwide
Mitsubishi Outlander Plug-in Hybrid	22/310	Nationwide
Porsche Cayenne E-Hybrid	14/490	Nationwide
Volvo XC60 T8 eAWD	17/500	Nationwide
Volvo XC90 T8 eAWD	17/490	Nationwide
Mercedes-Benz GLC 350e	10/350	Select Markets
Subaru Crosstrek Hybrid	17/480	Select Markets
COMPACT/HATCHBACK		
BMW i3 REx	126/200	Nationwide
Hyundai Ioniq Plug-in Hybrid	29/630	Nationwide
Toyota Prius Prime	25/640	Nationwide
SEDAN		
BMW 530e iPerformance	16/370	Nationwide
BMW 740e xDrive iPerformance	14/340	Nationwide
Ford Fusion Energi	26/610	Nationwide
Honda Clarity Plug-in Hybrid	47/340	Nationwide
Hyundai Sonata Plug-in Hybrid	28/600	Nationwide
Porsche Panamera 4 E-Hybrid	16/480	Nationwide
Volvo S90 T8 eAWD	21/490	Nationwide
Kia Optima Plug-in Hybrid	29/610	Select Markets
MINIVAN/WAGON/VAN		
Chrysler Pacifica Hybrid	32/520	Nationwide
Porsche Panamera 4 E-Hybrid Sport Turismo	16/480	Nationwide
ULTRA-LUXURY/LIMITED EDITION		
BMW i8 Coupe	18/320	Nationwide
BMW i8 Roadster	18/320	Nationwide
Karma Revero	37/240	Nationwide
Volvo S60 T8 Polestar Engineered		Sold out

EXPECTED LATER IN 2019

BATTERY ELECTRIC VEHICLE

MODEL NAME	RANGE (MI)[1]	WHEN
SUV/CROSSOVER		
Audi e-tron Sportback	200+	Late 2019
COMPACT/HATCHBACK		
MINI Cooper S E	200	Late 2019
Hyundai Ioniq Electric Gen 1+	167	Late 2019
Kia Soul EV Gen 2	243	Late 2019
SPORTS CAR		
Porsche Taycan	300	Late 2019
ULTRA-LUXURY/LIMITED EDITION		
Aston Martin Rapide E	200	Late 2019

[1] *Range: For battery electric vehicles is all-electric range. For plug-in hybrids is all-electric/combined (electric + gas) range. Sources for vehicles available now: www.fueleconomy.gov and manufacturer websites. Sources for vehicles expected in 2019: manufacturer and industry news websites, data subject to change.*

PLUG-IN HYBRID

MODEL NAME	RANGE (MI)[1]	WHEN
SUV/CROSSOVER		
Lincoln Aviator Grand Touring	TBA	Late 2019
Porsche Cayenne E-Hybrid Gen 1+	27/490	Mid 2019
Range Rover P400e	31/TBA	Mid 2019
Range Rover P400e Sport	31/TBA	Mid 2019
SEDAN		
Audi A6 e-tron	TBA	Late 2019
BMW 330e iPerformance Gen 2	37/TBA	Mid 2019
BMW 745e, 745Le, 745Le xDrive	30/TBA	Mid 2019
Mercedes-Benz S560e	22/TBA	Mid 2019
ULTRA-LUXURY/LIMITED EDITION		
Bentley Bentayga Hybrid	31/TBA	Early 2019
Maserati Levante Trofeo	TBA	Late 2019
Volvo Polestar 1	93/TBA	Late 2019

Future Vehicles: Global Momentum

Automakers continue to make bold statements about their electric vehicle development and deployment plans. Similarly, analysts offer big, sometimes optimistic, predictions about the future electric vehicle market.

Recently, much of the focus has centered on China, the world's largest automotive market, due to its electric vehicle requirements and incentives. One study estimates global automakers will in the next decade invest $300 billion in electric vehicle technology, with one-half of that investment in China. Another predicts EV sales will surge from 1 million annually to 6.5 million annually by 2025, spurred by China. Other observers caution that the rapid expansion of China's automotive production sector could create an overcapacity problem with too many electric vehicles and conventional cars available.

Beyond China, governments around the world, including many U.S. states, are adopting stringent carbon reduction policies. Automakers are investing in electrification, automation, and other new technologies. Consumer preferences are evolving as awareness of electric vehicles grows, technology advances, and prices drop. In the United States, comparatively cheap gas prices and the risk of the federal tax credit and various state electric vehicle purchase incentives ending contribute to market uncertainty. Interest rates are another variable that affect car purchases. Nonetheless, the global indicators point to growing momentum for vehicle electrification.

Table 3 summarizes recent reports of automaker statements on future vehicles and electrification.

Table 3 – Reports of automaker statements on future vehicles and electrification

Automaker	Statement
Audi	Invest $15.9 billion in electric mobility, digitalization, and autonomous driving by 2023. By 2025 offer 12 automobiles with all-electric drive in the most important markets worldwide and achieve roughly one-third of its sales with electrified[1] models.
BMW	By 2021, five all-electric models. By 2025, at least 12 all-electric models. Electric range on plug-in hybrids will increase significantly in 2019. Total electrified product portfolio of at least 25 models by 2025.
Fiat Chrysler	Spend approximately $10.5 billion through 2022 on electrification. Launch over 30 nameplates with electrified systems worldwide by the end of 2022, including hybrids and mild hybrids.
Ford	Spend $11 billion on electrification technology and introduce 40 electrified vehicles – 16 all-electric and 24 hybrid or plug-in hybrid – by 2022.
General Motors	At least 20 new or redesigned battery electric or fuel cell-powered vehicles globally by 2023 (emphasis: China). A Cadillac electric vehicle will be first to use GM's new platform in 2021.
Honda	Two-thirds of vehicle lineup electrified. A compact urban electric car in Japan by 2020.
Hyundai/Kia	Bring 38 "green car" models to market by 2025. Kia to offer 16 electrified vehicles comprising five hybrids, five plug-in hybrids, five electric vehicles, and one fuel cell vehicle.
Infinity	Electrify its product lineup from 2021 onward. All sales will be all-electric, electrified or hybrid by 2025.
Jaguar Land Rover	All new vehicles will be electrified.

Table 3 – Reports of automaker statements on future vehicles and electrification (continued)

Automaker	Statement
Jeep	Electrification options available across each nameplate by 2021, with four all-electric vehicles and 10 plug-in hybrid vehicles worldwide by 2022.
Mazda	Deploy some form of electrification in all production vehicles.
Mercedes-Benz	By 2022, offer customers at least one electrified alternative – a 48-volt mild hybrid, a high-voltage plug-in hybrid or an all-electric vehicle – in all segments. Out of more than 130 electrified vehicles, more than 10 will be powered by a battery alone. Electric models estimated to comprise 15–25% of total sales by 2025.
Nissan/Mitsubishi/Renault	Launch common electric vehicle platforms and components for multiple segments; 70% of electric vehicle volume based on shared platforms by 2022. A new family of motors and batteries introduced around 2020 and shared within the alliance. Nissan will launch eight new battery-powered electric vehicles by March 31, 2023. May not all be in U.S.
Porsche	One-half of Porsche models delivered globally will be electrified.
Toyota	10 electrified vehicles available globally (focus: China) by 2020. By 2030, sales of 1 million all-electric cars worldwide, and 5.5 million electrified vehicles in total.
Volkswagen Group (includes Audi, Porsche)	A total of $50 billion invested by 2023 in electric vehicles, self-driving cars, and other new technology. Capacity to build up to 15 million electric vehicles on its new MEB platform, with plans to offer 50 all-electric and 30 hybrid electric models by 2025. Eventually offer electrified versions of all 300 models in its 12-brand global portfolio, which includes Audi and Porsche.
Volvo	Volvo aims for all-electric cars to make up 50% of its sales by 2025.

[1] *"Electrified" may mean conventional or mild hybrid, not plug-in electric. However, expanded use of electric drive systems helps reduce costs and build the broader market for electric vehicles.*

Answers to Important Questions

How much does it cost to charge?

At the U.S. national average residential price of 12.5 cents per kilowatt-hour (kWh), fueling a car with electricity is roughly equivalent to buying gasoline at $1 a gallon. Many electricity providers offer discounted electric vehicle rates.

Can weather affect my car's performance?

Electric vehicles may draw energy from the traction battery for interior air-conditioning, heating, and window defrosting or defogging. This energy use can reduce driving range. Extremely cold weather also can reduce driving range. To minimize the effects, you can program the car to pre-condition the interior and battery while it is plugged in. Pre-conditioning also makes a car more immediately comfortable for passengers. Windshield wipers, headlights, and similar accessories do not affect range.

Where can I get an electric vehicle?

Some electric vehicle models are available nationwide. Some are available only in California, the Pacific Northwest, and some Northeast states that have adopted zero emission vehicle (ZEV) regulations. Still others can be ordered online from the manufacturer and delivered through a local dealer, even if that dealer is in a non-ZEV state or does not stock electric vehicles on the lot. Check automaker websites for updates on available and future models.

Used electric cars are also available. As people who bought the first generation of electric vehicles trade up to the newest models, their previous cars are now for sale in the used-car market as affordable electric vehicle options.

What incentives are available?

A federal tax credit of up to $7,500 may be available for qualified electric vehicles. Some state and local governments offer vehicle and charging station incentives. In some metros, electric vehicles can use carpool lanes with a single driver. Parking and charging perks are available in some cities. Some electricity providers offer rebates and incentives for electric vehicle charging. Incentives are subject to limitations and may change over time. More information is available at the *U.S. Dept. of Energy Office of Energy Efficiency and Renewable Energy*.

What should I consider in making a purchase?

Consider your driving needs and lifestyle. If you have only one car, or often drive long distances, a plug-in hybrid with its back-up internal combustion engine can provide a worry-free transition to electric vehicles. If you can charge at your workplace you can effectively double your range.

If you have a predictable daily driving pattern, or if you like the idea of a gasoline-free driving experience, a battery electric vehicle could be a good choice. Access to workplace or public charging may alleviate any range concerns.

Consider costs and benefits. With manufacturer lease options, discounted electricity rates, and government purchase incentives, electric vehicles can be less expensive to operate over their lifetime despite costing more to purchase. And like other new innovations, electric vehicle costs are coming down as technology improves and production scales.

Consider environmental benefits. Electric vehicles have lower emissions than gasoline-powered vehicles, even in areas where much of the electricity is generated by power plants that use fossil fuels. For more information, read EPRI publication, "Environmental Assessment of a Full Electric Transportation Portfolio" (Product ID *3002006881*).

FOR MORE INFORMATION

Explore automakers' websites for product updates and check your local electricity provider website for information about electric vehicles. Other sources:

Electric Drive Transportation Association
www.electricdrive.org and www.goelectricdrive.org

U.S. Dept. of Energy Alternative Fuels Data Center
www.afdc.energy.gov/fuels/electricity.html

U.S. Dept. of Energy Fuel Economy Information
http://www.fueleconomy.gov/

Plug In America
www.pluginamerica.org

Veloz
http://www.veloz.org/

For more information about EPRI Electric Transportation research activities contact:

Dan Bowermaster, *Program Manager,*
Electric Transportation
dbowermaster@epri.com

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3002015368

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