



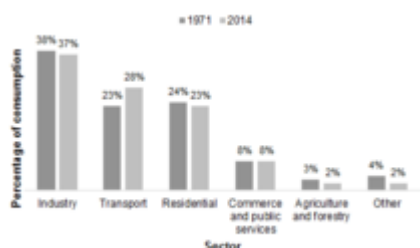
Worldwide Government incentives for plug-in electric vehicles



Plug-in electric vehicles subject to incentives in some countries include battery electric vehicles, plug-in hybrids and electric vehicle conversions. Shown here is a Toyota Prius Plug-in Hybrid recharging

Government incentives for plug-in hybrid electric vehicles have been established by several national and local governments around the world as financial incentives to plug-in electric vehicle vehicles to consumers. These mainly include tax exemptions and tax crs, and additional perks that range from access to bus lines to waivers on fees (charging, parking, tolls, etc.). The amount of these incentives usually depends on battery size and the vehicle all-electric range, and some countries extend the benefits to fuel cell vehicles, and electric vehicle conversions of hybrid electric vehicles and conventional internal combustion engine vehicles. The IEA determined that, as of 2016, 0.2% of all passenger vehicles (approximately 2 million electric vehicles) are currently on the road worldwide.

The world's total final consumption of energy by sector represented 9,426 Million Tonnes of Oil Equivalent (Mtoe) in 2014, 28% of which is attributed to transport alone, accounting for an increase of 5% from 1971 statistics. Moreover, 23% of energy-related Greenhouse Gas (GHG) emissions worldwide are also attributable to transport. Thus, the electrification of the transport sector represents an area of opportunity for governments to cut their GHG emissions, which is why they are starting to champion policies that increase plug-in hybrid electric vehicles adoption rates.



Total final consumption of energy by sector. The world's energy consumption more than doubled between 1971 (4,244 Mtoe) and 2014 (9,426 Mtoe). Even though the proportion of energy consumption per sector did not dramatically change, the percentage of energy consumption from transport increased by 5%.

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1.2 Asia

1.2.1 China

Main article: New energy vehicles in China

See also: Renewable energy in China and Automobile industry in China

BYD e6 all-electric taxi in Shenzhen, China.

The Chinese government adopted a plan in 2009 with the goal of turning the country into one of the leaders of all-electric and hybrid vehicles by 2012. The government's intention was to create a world-leading industry that would produce jobs and exports, and to reduce urban pollution and its oil dependence. However, a study found that even though local air pollution would be reduced by replacing a gasoline car with a similar-size electric car, it would reduce greenhouse gas emissions by only 19%, as China uses coal for 75% of its electricity production.



The Chinese government uses the term new energy vehicles (NEVs) to designate plug-in electric vehicles, and only pure electric vehicles and plug-in hybrid electric vehicles are subject to purchase incentives. On June 1, 2010, the Chinese government announced a trial program to provide incentives up to 60,000 yuan (~US\$9,281 in June 2011) for private purchase of new battery electric vehicles and 50,000 yuan (~US\$7,634 in June 2011) for plug-in hybrids in five cities. The cities participating in the pilot program are Shanghai, Shenzhen, Hangzhou, Hefei and Changchun. The subsidies are paid directly to automakers rather than consumers, but the government expects that vehicle prices will be reduced accordingly. The amount of the subsidy will be reduced once 50,000 units are sold. In addition to the subsidy, the Chinese government is planning to introduce, beginning on January 1, 2012, an exemption from annual taxes for pure electric, fuel-cell, and plug-in hybrid vehicles. Hybrid vehicles will be eligible for a 50% reduction only.

In 2011, only 8,159 electric cars were sold in China despite a 120,000 yuan subsidy. Unsubsidized lead-acid EVs are produced without government approval at a rate of more than 30,000 per year in Shandong and requires no driving license because the top speed is less than 50 km/h. They cost 31,600 yuan and have been the target of criticism from major car manufacturers.

A mid-September joint announcement in 2013 by the National Development and Reform Commission and finance, science, and industry ministries confirmed that the central government will provide a maximum of US\$9,800 toward the purchase of an all-electric passenger vehicle and up to US\$81,600 for an electric bus. The subsidies are part of the government's efforts to address China's problematic air pollution.

As a result of the government support and new incentives issued in 2014, production of new energy vehicles between January and August reached 31,137 units, up 328% from the same period of 2013. Domestic production during the first eight months of 2014 includes 6,621 plug-in hybrid sedans and 16,276 all-electric cars.

1.2.2 India

Mahindra e2o which is manufactured in India

In November 2010, the Government of India, through the Ministry of New and Renewable Energy (MNRE), announced a subsidy of ₹950 million for electric vehicles. The subsidy provided benefits up to 20% on the ex-factory price, with a maximum benefit of ₹100,000 on electric cars, 4,000 on two-wheelers, 5,000 on high speed two-wheelers, 400,000 rupees for electric minibuses, and 60,000 for three



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wheelers. To claim the subsidy, manufacturers need to certify that 30% of the components were made in India. The scheme ended on 31 March 2012.

In April 2014, the Indian government announced a new plan to provide subsidies for hybrid and electric vehicles. The plan will have subsidies up to ₹150,000 for cars and ₹30,000 on two wheelers. India aims to have seven million electric vehicles on the road by 2020.

Although, there is no such provision of subsidy or incentives towards hybrids vehicles and imported vehicles, these lack of provisions often act as deterrence to new entrants.

Moreover, the stated objective by the GoI to limit its carbon footprints under Paris agreement apart from limiting oil imports, the GoI has set deadline for 'Only Electric Vehicle (Manufacturing)' by 2030. Although highly ambitious as it may seem, there is growing recognition among policy makers to incentivise electric vehicle manufacturing under 'Make In India' policy, and a new framework policy for this is under anvil to be released by year end, 2017. Moreover, infrastructure for electric vehicle charging is also being considered to be provided either through existing energy retailers like fuel pumps or by providing subsidies to vehicle manufacturers investments in the field.

Tesla motors have been offered by the government to establish a manufacturing unit in India at highly lucrative rate apart from tax incentives and potential financial backing in form of Special purpose vehicle (SPV's). Although, there are local sourcing norms of 30%, Electric vehicle entrants have been exempted from such norms. Yet much will depend on governments plan to subsidize the vehicle, due their high upfront cost, that will determine any potential shift in the market.

According to OECD report, India is regarded as countries providing least subsidy, compared to other major markets, to renewable energy in electric vehicle division that may hamper the government's target of achieving all electric by 2030.

Various state governments and cities provide their own subsidies:

- Delhi, Rajasthan, Uttarakhand and Lakshadweep don't levy VAT
- Chandigarh, Madhya Pradesh, Kerala, Gujarat & West Bengal offer partial rebate on VAT
- Delhi also provides a 15% subsidy of the base price of select electric cars, like REVA. It also exempts such cars from road tax and registration fees.

1.2.3 Japan

See also: Plug-in electric vehicles in Japan

The Japanese government introduced the first electric vehicle incentive program in 1996, and it was integrated in 1998 with the Clean Energy Vehicles Introduction Project, which provided subsidies and tax discounts for the purchase of electric, natural gas, methanol and hybrid electric vehicles. The project provided a purchase subsidy of up to 50% the incremental costs of a clean energy vehicle as compared with the price of a conventional engine vehicle. This program was extended until 2003.



In May 2009 the National Diet passed the "Green Vehicle Purchasing Promotion Measure" that went into effect on June 19, 2009, but retroactive to April 10, 2009. The program established tax deductions and exemptions for environmentally friendly and fuel efficient vehicles, according to a set of stipulated environmental performance criteria, and the requirements are applied equally to both foreign and domestically produced vehicles. The program provides purchasing subsidies for two types of cases, consumers purchasing a new passenger car without trade-in (non-replacement program), and for those consumers buying a new car trading a used car registered 13 years ago or earlier (scrappage program).

1.2.3.1 Tonnage and acquisition tax reductions

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The cost of the Mitsubishi i MiEV in Japan falls from ¥4 million to ¥2.8 million after all government incentives are discounted from the sales price.

New next generation vehicles, including electric and fuel cell vehicles, plug-in hybrids, hybrid electric vehicles, clean diesel and natural gas vehicles are exempted from both the acquisition tax and the tonnage tax. Acquisition taxes on used vehicles will be reduced by 1.6% to 2.7%, or between 150,000 yen (~US\$1,600) and 300,000 yen (~US\$3,200). Electric and fuel cell vehicles have a 2.7% reduction while plug-in hybrids have a 2.4% reduction.

These incentives are in effect from April 1, 2009 until March 31, 2012 for the acquisition tax which is paid once at the time of purchase. The tonnage tax reductions are in effect from April 1, 2009 until April 30, 2012 and the incentive is applicable once, at the time of the first mandatory inspection, three years after the vehicle purchase. As an example, the amount exempted for the purchase of a new next generation vehicle is 81,000 yen (~US\$975) corresponding to the acquisition tax, and 22,500 yen (~US\$271) for the tonnage tax, for a total of 103,500 yen (~US\$1,246).

1.2.3.2 Automobile tax reductions

Consumers purchasing new next generation electric vehicles, including fuel cell, benefit of a 50% reduction of the annual automobile tax. These incentives were in effect from April 1, 2009 until March 31, 2010, applicable only once.

1.2.3.3 Incentives for purchasing new green vehicles

Subsidies for purchases of new environmentally friendly vehicles without scrapping a used car are 100,000 yen (~US\$1,100) for the purchase of a standard or small car, and 50,000 yen (~US\$550) for the purchase of a mini or kei vehicle. Subsidies for purchasing trucks and buses meeting the stipulated fuel efficiency and emission criteria vary between 200,000 yen (~US\$2,100) to 900,000 yen (~US\$9,600).

Subsidies for purchases of new environmentally friendly vehicles in the case of owners scrapping a 13-year or older vehicle are 250,000 yen (~US\$2,700) for the purchase of a standard or small car, and 125,000 yen (~US\$1,300) for the purchase of a mini or kei vehicle. Subsidies for purchasing trucks and buses meeting the stipulated fuel efficiency and emission criteria vary between 400,000 yen (~US\$4,300) to 1,800,000 yen (~US\$19,000).

All incentives for new purchases with or without trading were applicable in Japan's fiscal year 2009, from April 1, 2009 through March 31, 2010.

1.2.4 South Korea

In July 2016, the Ministry of Trade, Industry and Energy announced a plan to make electric car batteries run longer, build a network of charging stations and make electric car purchases and ownership more affordable. The government expects that the current and future policy programs will help increase the electric car market share in South Korea to 0.5% in 2017, up from 0.2% in 2015, and to achieve 5.3% in 2020.

The government subsidy has in place a one-time purchase subsidy for electric cars. Effective July 8, 2016, the subsidy was increased to 14 million won (US\$12,100) from 12 million won (US\$10,400). Also starting in 2016, the purchase tax surcharges of electric cars will be reduced, and all-electric car drivers will benefit from reductions in insurance premiums, expressway tolls and parking fees. The government plan calls for the deployment of fast charging stations in 2020 to be available at an average of one within a two-kilometer radius in the capital city of Seoul. In addition, 30,000 slow charging stations will be strategically located at about 4,000 apartment complexes nationwide by 2020.

The government's plan also includes the development of an electric car battery, beginning in 2016, with energy density high enough to more than double the travel distance on a charge to 400 km (250 mi). The government expects to increase the global market share of South Korean electric cars to match that of South Korean gasoline and diesel cars, which reached 8.5% based on sales by South Korea's two main car exporters, Hyundai Motor Company and Kia Motors.

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1.3 Europe

Electrification of transport (electromobility) figures prominently in the Green Car Initiative (GCI), included in the European Economic Recovery Plan. DG TREN is supporting a large European "electromobility" project on EVs and related infrastructure with a total budget of around €50 million as part of the Green Car Initiative.

There are measures to promote efficient vehicles in the Directive 2009/33/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of clean and energy-efficient road transport vehicles and in the Directive 2006/32/EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services.

As of April 2011, 15 of the 27 European Union member states provide tax incentives for electrically chargeable vehicles, which includes all Western European countries plus the Czech Republic and Romania. Also 17 countries levy carbon dioxide related taxes on passenger cars as a disincentive. The incentives consist of tax reductions and exemptions, as well as of bonus payments for buyers of PEVs, hybrid vehicles, and some alternative fuel vehicles.

1.3.1 Austria

Electric vehicles are exempt from the fuel consumption tax, levied upon the first registration, and from the monthly vehicle tax. In addition to tax breaks, hybrid vehicles and other alternative fuel vehicles benefit from a fuel consumption tax that pays bonuses to passenger cars with low carbon dioxide output. Alternative fuel vehicles, including hybrids, qualify for as much as €800 (around US\$1,120) in annual bonuses. This bonus was valid from 1 July 2008 until 31 August 2012.

1.3.2 Belgium

The Belgian government established a personal income tax deduction of 30% of the purchase price including VAT of a new electric vehicle, up to €9,190. Plug-in hybrids are not eligible. This tax incentive ended on December 31, 2012. There is also available a tax deduction up to 40% for investments in external recharging stations publicly accessible, to a maximum of €250. The Wallonia regional government has an additional €4,500 eco-bonus for cars registered before December 31, 2011.

1.3.3 Bulgaria

Electric vehicles are exempt from the annual registration tax, park without paying in the capital's center and are exempt from needing to pay for a vignette to drive on highways.

1.3.4 Czech Republic

Electric, hybrid and other alternative fuel vehicles used for business purposes are exempt from the road tax.

1.3.5 Denmark

Denmark was planning to introduce a greater number of battery driven electric cars on the streets — charged on renewable energy from the country's many wind turbines — ahead of the UN Climate Summit that descended on Copenhagen in December 2009. Around a third of the electricity is generated by wind turbines.

Electric vehicles weighing under 2,000 kg are exempt from the new car registration tax since 1985, but available models were so limited that by 2009 only 497 EVs are registered in the entire country. The registration tax in Denmark is based on the vehicle's purchase price, and was set at 105% if the vehicle price is up to DKK79,000 (around US\$13,250) and 180% if the price is above DKK79,000. ^{needs update} The government also grants free parking in downtown Copenhagen for EVs. This exemption does not apply to hybrid electric vehicles. As of 2016 there are only 7,000 electric cars in Denmark.

1.3.6 Estonia

No grants towards the purchase of Plug-In or Electric vehicles as of 2016. Electric vehicles are exempt from the city public parking fees and can use bus lanes.

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From 2011 to 2014 Estonia has allocated a total of €9,000,000 in grants towards the purchase of battery electric vehicles (ended 7 August 2014). From 2011 to 2014, KredEx has allocated grants totaling €10,500,000; the average grant per car was €16,500. The grant for the purchase of electric cars was helped purchase over 650 electric cars in Estonia. At that time, a country-wide quick charging network (CHAdeMO 500V/120A and Type2 400V/32A) was established.

1.3.7 Finland

The Prime Minister of Finland (2003–2010) Mr. Matti Vanhanen has mentioned that he wants to see more electric cars on Finnish roads as soon as possible and with any cost to the governmental car related tax incomes. Charging at home from motor and cabin heating outlets (common in all Nordic countries) has been determined to be a possible load on the grid, although this load is expected to mainly take place at night when overall demand is lower. If all cars in Finland run totally on electricity, it will add 7-9 TWh annually to the load, which corresponds to 10% of Finland's annual consumption. On-line route planners like <http://www.uppladdning.nu/> list a daily growing number of free charging outlets set up by merchants and private individuals, making it possible to drive an EV for free from Helsinki through Sweden all the way to Copenhagen.

1.3.8 France

See also: Plug-in electric vehicles in France

See also: French bonus-malus

Since 2008 France has a bonus-malus system offering a financial incentive, or bonus, for the purchase of cars with low carbon emissions, and a fee, or malus, for the purchase of high-emission vehicles. The bonus applies to private and company vehicles purchased on or after 5 December 2007 and are deducted from the purchase price of the vehicle. The malus penalty applies to all vehicles registered after 1 January 2008, and is added at the time of registration. Since 2009, every family with more than two children receives a deduction from the malus of 20 g of CO₂ per km per child.

2012-2014

Electric cars purchase under a battery leasing contract, such as the Renault Zoe, are eligible for the full €6300 bonus for zero CO₂ emission vehicles.

Until July 31, 2012, a premium up to €5,000, under the bonus-malus system, was granted for the purchase of new cars with CO₂ emissions of 60 g/km or less which benefited all-electric cars and any plug-in hybrid with such low emissions. Vehicles emitting up to 125 g/km or less, such as conventional hybrids and natural gas vehicles, were granted up to €2,000. The incentive could not exceed 20% of the sales price including VAT, increased with the cost of the battery if it is rented.

Effective on August 1, 2012, the government increased the bonus for electric cars up to €7,000 but capped at 30% of the vehicle price including VAT. The price includes any battery leasing charges, and therefore, electric cars which need a battery leasing contract also are eligible for the bonus. For example, an electric car sold for €23,333 including VAT was eligible for the maximum bonus of €7000. The emission level for the maximum bonus was raised to 20 g/km or less. Cars with emission levels between 20 and 50 g/km were eligible to a bonus of up to €5,000, and between 50 and 60 g/km were eligible to a bonus of up to €4,500. After this limit, the bonus dropped to €550.

The fee schedule for the bonus-malus was modified in 2013. Effective November 1, 2013, the bonus was reduced from €7,000 to €6300 for all-electrics and any other vehicle with CO₂ emissions of less than 21 g/km. Vehicles emitting between 21 and 60 g/km, such as plug-in hybrids and conventional hybrids, were eligible to a bonus up to €4,000, and for emissions between 61 and 90 g/km up to €150, down from €550. Effective January 1, 2014, the fee schedule for the malus was increased to a maximum penalty of €8,000 from €6,000 for vehicles emitting over 200



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g/km. Flex-fuel vehicles remained exempt from the malus fee. A neutral class applies to vehicles emitting between 91-130 g/km.

2015-2016

From April 1, 2015, a super-bonus was introduced, increasing the financial incentive to a cumulative total of €10,000, consisting of the regular bonus of €6300 for purchasing a pure electric car, plus up to €3700 for customers scrapping a diesel-powered car in circulation before 1 January 2001. In the case of plug-in hybrids with CO₂ emission levels between 21 and 60 g/km, the purchase bonus was €4000 plus the scrapping premium of €3700. Also a specific €500 grant was introduced for families which are below the income tax threshold who buy an ordinary new or second hand car below certain CO₂ emission thresholds or a hybrid or electric car.

Electric cars equipped with a range extender, such as the BMW i3 REx, are entitled to the €6300 bonus if emitting between 21 and 60 g/km of CO₂.

Effective January 4, 2016, the €6300 bonus limited to 27% of the purchase price of vehicles emitting up to 20 g/km was kept. This bonus corresponds to pure electric vehicles and those equipped with a range extender. Vehicles emitting between 21 and 60 g/km are entitled to a €1000 bonus. This bonus corresponds to the majority of plug-in hybrids.

Conventional hybrid passenger cars emitting between 61 and 110 g/km with sufficient level of hybridization, with an electric motor with an output power of not be less than 10 kW, are entitle to a €750 bonus. Diesel-powered hybrids, such as the PSA Hybrid4, are no longer eligible for the bonus, even if the car emits less than 110 g/km of CO₂.



The combined €10000 super-bonus for the purchase or lease of a new all-electric car was maintained. To be eligible for the additional scrappage bonus, the old diesel-powered car have to be owned for at least a year and in circulation before 1 January 2006. The new vehicle must not be sold within 6 months of acquisition or have traveled less than 6,000 km (3,700 mi).

The scrappage bonus for the purchase of an all-electric car was maintained at €3700, while the bonus for plug-in hybrid car emitting between 21 and 60 g/km was set at €2500. Only individuals or professionals are eligible for the scrappage bonus. Commercial vehicles are not eligible. Neither demonstration vehicles are eligible to the superbonus unless the vehicles are sold or leased within one year following the date of first registration. As of September 2016, the scrappage bonus of €3700 for trading in old diesel-powered cars has been granted to more than 10,000 purchase transactions.

2017

As of September 2016, the government proposal to be in force from 1 January 2017 provides that the €10,000 super-bonus for scrapping a diesel vehicle over 10 years-old will be renewed. However, the bonus for the purchase of a pure electric car will drop to €6000 from €6300 in 2016, but to compensate, the additional scrappage bonus will be increased to €4000 from €3700 in 2016. Also, the government plans to introduce a purchase price cap to the vehicles eligible for the bonus, and to introduce a new bonus for two-wheeled motor vehicles. For the more polluting vehicles, the government intends to increase the maximum malus fee to €10000 from €8000 in 2016 for vehicles emitting more than 191 g/km, lowering the limit from 200 g/km in 2016.

The government intends to maintain the €1000 purchase bonus for plug-in hybrids with a CO₂ emission level between 21 and 60 g/km. However, the proposal does not include anything about the conversion premium for scrapping a 10-year-old diesel car for the purchase of a plug-in hybrid. The purchase bonus for non-rechargeable hybrid vehicles will be eliminated.

1.3.9 Germany

See also: Plug-in electric vehicles in Germany

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Chancellor Angela Merkel announced her goal to bring 1 million electric vehicles on German roads at the 2010 Electromobility Summit in Berlin.

"Nationale Plattform Elektromobilität" (NPE) is a German government initiative to develop Germany into a leading market for electric mobility. In May 2010, under its National Program for Electric Mobility, Chancellor Angela Merkel set the goal to bring 1 million electric vehicles on German roads by 2020. However, the government also announced that it would not provide subsidies to the sales of plug-in electric cars but instead it will only fund research in the area of electric mobility. Electric vehicles and plug-ins are exempt from the annual circulation tax for a period of five years from the date of their first registration. In 2016, the annual circulation tax exemption was extended from five to ten years, backdated to 1 January 2016.

The private use of a company car is treated as taxable income in Germany and measured at a flat monthly rate of 1% of the vehicle's gross list price. So plug-in electric cars have been at a disadvantage since their price tag can be as much as double that of a car using a conventional internal combustion engine due to the high cost of the battery. In June 2013 German legislators approved a law that ends the tax disadvantage for corporate plug-in electric cars. The law, backdated to 1 January 2013, allows private users to offset the list price with €500 per unit of battery size, expressed in kilowatt hours (kWh). The maximum offset was set at €10,000 corresponding to a 20 kWh battery. The amount one can offset will sink annually by €50 per kilowatt hour. The range criteria will rise to 40 km (25 mi) starting in 2018. As part of the package of financial incentives approved in 2016, private owners of plug-in electric vehicles that charge their cars in their employer premises are exempted from declaring this perk as a cash benefit in their income tax return. Employers who provide this perk are allowed to discount from their income tax a 25% of the lump sum value of the cash benefit. These two fiscal benefits apply only from 1 January 2017 until the end of 2020.



Smart ED all-electric car (right) and Opel Ampera plug-in hybrid (left) in Germany

In August 2014, the federal government announced its plan to introduce non-monetary incentives through new legislation to be effective by 1 February 2015. The proposed user benefits include measures to privilege battery-powered cars, fuel cell vehicles and some plug-in hybrids, just like Norway does, by granting local governments the authority to allow these vehicles into bus lanes, and to offer free parking and reserved parking spaces in locations with charging points. Not all plug-in hybrids will qualify

for the benefits, only those with CO₂ emissions of no more than 50 g/km or an all-electric range of over 30 km (19 mi) are eligible.

According to the fourth progress report of the German National Electric Mobility Platform, only about 24,000 plug-in electric cars are on German roads by the end of November 2014, well behind the target of 100,000 unit goal set for 2014. As a result, Chancellor Angela Merkel recognized in December 2014 that the government has to provide more incentives to meet the goal of having 1 million electric cars on the country's roads by 2020. Among others, and based on the recommendations of the report, the federal government is considering to offer a tax break for zero-emission company cars, more subsidies to expand charging infrastructure, particularly to deploy more public fast chargers, and more public funding for research and development of the next generation of rechargeable batteries.

Purchase incentive

At the beginning of 2016, German politicians from the three parties in Mrs. Merkel's ruling coalition and auto executives began talks to introduce a subsidy for green car buyers worth up to €5000 (US\$5,500) to boost sales of electric and plug-in hybrid cars. As of February 2016, the German government proposal is for the auto industry to

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cover 40% of the cost of the purchase subsidy. Private buyers would get the full €5000 subsidy, while corporate buyers would receive €3000 for each electric car, and the program is expected to run until 2020, the deadline set to achieve the goal of 1 million electric cars on German roads. Incentives will fall by €500 each year. In March 2016, Nissan Europe announced its support to the green car incentive and its commitment to double the government's E-premium incentive when buying a Nissan electric car, with a reduction of the purchase price of the same amount of the subsidy. Nissan Center Europe CEO said "*we remain convinced that the goal of one million electric cars by 2020 is still achievable.*" According to Nissan if from now on electric car sales double every year until 2020, it is still possible to achieve the government goal.



The Tesla Model S, and other premium cars with a purchase price over €60,000 (US\$67,800) are not eligible to the purchase bonus.

An incentive scheme to promote plug-in electric vehicle adoption was approved in April 2016 with a budget of €1 billion (US\$1.13 billion). A total of €600 million (US\$678 million) is reserved for the purchase subsidies, which are expected to run until all the money is disbursed, estimated to last until 2019 at the latest. Another €300 million (US\$339 million) are budgeted to finance the deployment of charging stations in cities and on autobahn highway stops. And another €100 million (US\$113 million) would go toward purchasing electric cars for federal government fleets. The program is aimed to promote the sale of 400,000 electric vehicles. The cost of the purchase incentive is shared equally between the government and automakers. Electric car buyers get a €4000 (US\$4,520) discount while buyers of plug-in hybrid vehicles get a discount of €3000 (US\$3,390). Premium cars, such as the Tesla Model S and BMW i8, are not eligible to the incentive because there is a cap of €60,000 (US\$67,800) for the purchase price. Only electric vehicles purchased after 18 May 2016 are eligible for the bonus and the owner must keep the new electric car at least nine months. The same rule applies for leasing.

As of September 2016, BMW, Citroën, Daimler, Ford, Hyundai, Kia, Mitsubishi, Nissan, Peugeot, Renault, Toyota, Volkswagen, and Volvo had signed up to participate in the scheme. In May 2016, Nissan announced the company decided to raise the bonus with an additional €1000 (US\$1,130) to €5000 (US\$5,650) for customers of its all-electric Leaf car and e-NV200 utility van. The online application system to claim the bonus went into effect on 2 July 2016. As of September 2016, a total of 26 plug-in electric cars and vans are eligible for the purchase bonus. According to the Federal Office of Economics and Export Control (BAFA), a total of 4,451 applications have been made for the government subsidy for the purchase of a plug-in electric model as of 30 September 2016, consisting of 2,650 all-electrics and 1,801 plug-in hybrids. As of 30 September 2016, the federal states with the most claims are Bayern (1,130), Baden-Württemberg (873), and Nordrhein-Westfalen (726).

As of 1 September 2016, the following 26 plug-in electric cars and vans are eligible for the purchase bonus: Audi A3 e-tron, BMW 225xe, BMW 330e, BMW i3, Citroën Berlingo Electric, Citroën C-Zero, Ford Focus Electric, Kia Soul EV, Mercedes-Benz B-Class Electric Drive (B 250e), Mercedes-Benz C350 e, Mitsubishi i-MiEV, Mitsubishi Outlander P-HEV, Nissan e-NV200 5- and 7-seater Combi, Nissan Leaf, Peugeot iOn, Peugeot Partner Electric, Renault Kangoo Z.E., Renault Zoe, Smart Fortwo electric drive, Toyota Prius Plug-in Hybrid, Volkswagen e-Golf, Volkswagen e-Up!, Volkswagen Golf GTE, Volkswagen Passat GTE, and Volvo V60 Plug-in Hybrid.

1.3.10 Greece

From 2011 to June 2016, all electric vehicles were exempt from the registration tax. From 1 July 2016 onwards the registration tax for hybrid vehicles was reduced to 50%.

1.3.11 Hungary

All hybrid and electric vehicles are exempt from registration tax. The Government announced that from October 27, 2016, electric vehicles would be eligible for a 21% rebate of the gross purchase price, capped at a 1,500,000 Ft (€4,800 at the December 2016 exchange rate). Furthermore, to promote electric cars, the

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Government has added some other regulatory incentives, such as green license plates, and simplified tax and regulations on electric charge points. By 2020, the Government expects that there will be 30,000 environmentally friendly cars on Hungarian roads.

1.3.12 Iceland

All electric vehicles are exempt from VAT up to Íkr 6,000,000, and the tax is applied at the normal rate for the remainder of the price. Electric vehicles also get free parking in the city center for up to 90 minutes, which also applies to cars with CO₂ emissions of less than 120 g/km and weigh less than 1,200 kg, which excludes several electric cars such as the Tesla Model S.

1.3.13 Ireland

The Opel Ampera plug-in hybrid is available in several European countries.

Series production EVs were exempted from VRT until December 2012. The VRT exemption was replaced by a €5000 cr against the tax. Annual motor tax for EVs is €120. The Government has set a target of 10% for all vehicles on Irish roads to be electric by 2020.

The ESB eCar electric vehicle charging network serves as the main charging network for the island of Ireland and has rapidly expanded in recent years. Currently the network is free to use with an RFID card provided by ESB to EV owners who wish to use the network. The network aims to provide rapid charging every 30 km on major routes and as of 2015 has almost 2000 standard charging points (all provide connection via IEC 62196 Type 2 Mennekes, around half are 22 kW with the remainder a mix of 3.6 kW and 7.4 kW). There are around 100 CHAdeMO rapid chargers with over 70 located outside the Dublin Metro area. All rapid chargers installed since mid-2014 have been triple standard CHAdeMO/Combined Charging System/AC 43 kW. Four rapid chargers in Dublin and two rapid chargers in Belfast were co-funded by the EU as part of the UK/Ireland RCN program. The UK charging network operated by Ecotricity has a single CHAdeMO only rapid charger at IKEA Belfast. This is the sole rapid charger on the island that is not part of the ESB eCars network.



Sustainable Energy Authority of Ireland offers a government grant of up to €5,000 for the purchase of a new electric car. Electric and hybrid vehicles had a reduction of up to €2,500 off the registration tax between July 2008 and December 2010. However this grant is only available on vehicles on an approved list of models which must be sold by a dealer registered for the scheme. No grant applies where a vehicle is imported privately. The grant is reduced to €3,800 for business purchasers or those who require finance to purchase the vehicle, however some importers will report financed private sales as cash sales to acquire the full grant.

As of September 2014, plug-in electric car purchasers are eligible for a government cr worth up to €5,000 (about US\$6,500). Vehicle Registration Tax (VRT), up to €5,000 is also waived for electric cars. Also, all-electric car owners pay the lowest rate of annual road tax, which is based on emissions. In addition, the first 2,000 electric cars registered in Ireland are eligible for installation of a free home-charging points worth about €1,000 (about US\$1,300).

1.3.14 Italy

Electric vehicles are exempt from the annual circulation tax or ownership tax for five years from the date of their first registration. Thereafter, EVs benefit from a 75% reduction of the tax rate applied to equivalent gasoline-powered vehicles. In the region of Lombardy, electric vehicles are exempt from the annual ownership tax.

1.3.15 Luxembourg

Buyers of electric vehicles and other vehicles emitting 60 g/km or less of carbon dioxide are eligible to receive a premium of €3,000 (around US\$4,200), this premium ended 31 December 2011. In order to qualify for the rebate, the owner must have concluded an agreement to buy electricity from renewable energy.

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1.3.16 Monaco

Buyers of electric vehicles and plug in hybrids are eligible to receive €9,000 (around US\$12,600) from the Monegasque Government. In addition vehicles owners are allowed to park free at any public parking facility.

1.3.17 Netherlands

See also: Plug-in electric vehicles in the Netherlands

Launched in the Dutch market in 2013, the Mitsubishi Outlander P-HEV is the country's top selling ever plug-in electric vehicle.



Considering the potential of plug-in electric vehicles in the country due to its relative small size and geography, the Dutch government set a target of 15,000 to 20,000 electric vehicles with three or more wheels on the roads in 2015; 200,000 vehicles in 2020; and 1 million vehicles in 2025. The first government target was achieved in 2013, two years earlier, thanks to the sales peak that occurred at the end of 2013. According to official figures, 30,086 plug-in electric vehicles with three or more wheels have been registered in the country through 31 December 2013.

Initially, the Dutch government set incentives such as the total exemption of the registration fee and road taxes, which resulted in savings of approximately €5,324 for private car owners over four years, and €19,000 for corporate owners over five years. Other vehicles including hybrid electric vehicles were also exempt from these taxes if they emit less than 95 g/km for diesel-powered vehicles, or less than 110 g/km for gasoline-powered vehicles. The exemption from the registration tax ended on January 1, 2014, and thereafter, all-electric vehicles pay a 4% registration fee and plug-in hybrids a 7% fee.

In addition, the national government offers through the Ministry of Infrastructure and the Environment a €3,000 subsidy on the purchase of all-electric taxis or delivery vans. This subsidy increases to €5,000 per vehicle in Amsterdam, Rotterdam, The Hague, Utrecht, and Arnhem-Nijmegen metropolitan area. An additional subsidy is offered by several local government for the purchase of full electric taxis and vans, €5,000 in Amsterdam and €3,000 in Limburg and Tilburg.



Tesla Model S in Amsterdam. The Model S is the country's top selling all-electric car ever.

In Amsterdam EV owners also have access to parking spaces reserved for battery electric vehicles, so they avoid the current wait for a parking place in Amsterdam, which can reach up to 10 years in some parts of the city. Free charging is also offered in public parking spaces. EV owners in the city of Rotterdam are entitled to one year of free parking in downtown and enjoy subsidies of up to €1,450 if they install a home charger using green electricity. The city also introduced in 2014 a scrappage program to remove

old polluting vehicles to improve air quality in the city. Rotterdam offers a €2,500 incentive for business buyers to replace the old vehicles with all-electric vehicles. The subsidy is only available to the first 5,000 applicants that buy an eligible vehicle before the end of December 2013. Other factors contributing to the rapid adoption of plug-in electric vehicles are the relative small size of the country, which reduces range anxiety (the Netherlands stretches about 100 mi (160 km) east to west); a long tradition of environmental activism; high gasoline prices (US\$8.50 per gallon as of January 2013), which make the cost of running a car on electricity five times cheaper; and also some EV leasing programs provide free or discounted gasoline-powered vehicles for those who want to take a vacation driving long distances. With all of these incentives and tax breaks, plug-in electric cars have similar driving costs to conventional cars.

Initially, sales of plug-in electric car were lower than expected, and during 2012 the segment captured a market share of less than 1% of new car sales in the country. As a result of the end of the total exemption of the

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registration fee, the segment sales peaked at the end of 2013, and plug-in electric car sales reached a market share of 5.34% of new car sales in 2013. The total cost of the tax exemptions for the Dutch treasury of the more than 22,000 plug-in electric vehicles sold in 2013 was estimated at €500 million (US\$691 million).

1.3.18 Norway

See also: Plug-in electric vehicles in Norway

The Buddy and REVAi were among the top selling electric cars in Norway until 2010. Shown a free parking lot for EVs with charging stations.

The Parliament of Norway set the goal to reach 50,000 zero emission vehicles by 2018. Among the existing incentives, all-electric cars are exempt in Norway from all non-recurring vehicle fees, including purchase taxes, which are extremely high for ordinary cars, and 25% VAT on purchase, together making electric car purchase price competitive with conventional cars. As an example, by early 2013 the price of the top selling Nissan Leaf is 240,690 kroner (around US\$42,500) while the purchase price of the 1.3-lt Volkswagen Golf is 238,000 Krone (about US\$42,000). Electric vehicles are also exempt from the annual road tax, all public parking fees, and toll payments, as well as being able to use bus lanes.



Government officials reserved in 1999 the "EL" prefix for exclusive use of all-electric vehicles in order to be able to enforce on the road the benefits available to EVs. As the "EL" series is set to end at "EL 99999" (most vehicles in the country have five-digit registration numbers between 10000 and 99999), the Norwegian Public Roads agency opted for the prefix "EK" in the second series of plates, to signify "*elektrisk kjøretøy*", Norwegian for electric vehicle. And because the sale of electric vehicles is expected to continue at a rapid pace, meaning that the second phase of license plates is likely to run out as well, the "EV" prefix has been set aside for future electric cars. In July 2016, as the stock of "EL" prefix plates was almost depleted, the first electric vehicles registered with the new "EK" series were on the road.

Until June 2013, plug-in hybrids have not been eligible for these benefits. Because the Norwegian tax system levies higher taxes to heavier vehicles, plug-in hybrids are more expensive than similar conventional cars due to the extra weight of the battery pack and its additional electric components. Beginning on 1 July 2013, the existing weight allowance for conventional hybrids and plug-in hybrids of 10% will be increased to 15% for PHEVs.

Electric cars have access to bus lanes in Norway. Shown a Nissan Leaf, the top selling plug-in electric car in the country since 2012.

In September 2013 the Norwegian Parliament approved, as part of the revised 2014 budget, an exemption from the 25% VAT for leasing electric vehicles effective on 1 January 2014. However, as of September 2014, the exemption has not gone into effect because the Minister of Finance decided to defer the measure, pending a formal consultation with the EFTA Surveillance Authority (ESA) to ensure that the VAT exemption for leasing was not in violation of the European Economic Area Agreement. The government's loss of revenue due to the still not implemented leasing exemption is estimated at about 47 million krone (around US\$7.3 million) per year. One Member of Parliament has criticized the government for the delay. He had argued that the initial VAT exemption for all electric vehicles was never approved in ESA. In addition, an ESA spokesman confirmed that the Government has not sent any request as of September 2014, nor has ESA received any complaints about Norway's original EV tax exemption. The MP said he will demand that the decision be implemented when Parliament meets in October 2014.



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The government's initial goal of 50,000 electric cars on Norwegian roads was reached on 20 April 2015. The plate "EL 60000" was granted to the 50,000th electric car registered.

The target of 50,000 electric cars on Norwegian roads was reached on 20 April 2015, more than two years earlier than expected. In early March 2015 negotiations began among parties represented in the Parliament to define the future of all motor vehicles and fuel taxes. The Liberal Party wanted all the benefits to continue beyond the established quota. The

Ministry of Finance also made a comprehensive review of all motor vehicle taxes. The two purchase tax exemptions cost the government about 3 billion krone (around US\$480 million) in lost revenue just in 2014, and up to 4 billion krone (around US\$640 million) if all the other benefits are accounted for. Despite passing the established cap of 50,000 electric cars, the tax benefits were expected to continue at least until the end of 2016.

1.3.18.1 Phase out of incentives

In May 2015 the Government decided to keep the existing incentives through 2017, and the political parties in Parliament agreed to reduced and phase out some of the incentives. Beginning in January 2018, electric car owners will be required to pay half of the yearly road license fee and the full rate as of 2020. The value-added tax (VAT) exemption for electric cars will end in 2018, but replaced by a new scheme, which may be subjected to a ceiling that could be reduced as technology develops. The agreement also gave local authorities the right to decide whether electric cars can park for free and use public transport lanes.

In March 2016, the Ministry of Transport issued new regulations for parking in locations with access to the general public. The new parking regulations, that go into effect on January 1, 2017, terminated the free parking for zero-emission vehicles, but established that Municipalities can introduce payment exemption for electric and hydrogen powered motor vehicles on municipal parking locations. As of September 2016, the city councils of Trondheim and Tønsberg decided to introduce full payment for EVs from 2017; the cities of Bodø and Tromsø will introduce payment for parking in downtown but exempted parking outside the city's center; and the cities of Oslo, Mandal and Drammen decided to keep free parking for zero-emission vehicles.

1.3.19 Portugal

The Portuguese Government launched in early 2008 a national Programme for Electric Mobility called Mobi.E.

Mobi.E is deploying a national electric mobility system. The system was designed to be scalable and used in multiple geographies, overcoming the current situation of lack of communication among the different electric mobility experiences that are being deployed in Europe. By the first semester of 2011, a wide public network of 1 300 normal and 50 fast charging points will be fully implemented in the main 25 cities of the country.

EVs are fully exempt from both the Vehicle Tax due upon purchase (Imposto Sobre Veículos) and the annual Circulation Tax (Imposto Único de Circulação). Personal income tax provides an allowance of EUR 803 upon the purchase of EVs. EVs are exempt from the 5%-10% company car tax rates which are part of the Corporation Income Tax. The Budget Law provides for an increase of the depreciation costs related to the purchase of EVs for the purpose of Corporation Income Tax.

Portugal established a government subsidy of €5,000 for the first 5,000 new electric cars sold in the country. In addition, there is in place a €1,500 incentive if the consumer turns in a used car as part of the down payment for the new electric car. Electric cars are also exempt from the registration tax.

1.3.20 Romania

As of April 2011, Romania offers a government grant of up to 25% of the price (up to a maximum of €5,000) for the purchase of a new electric car. Furthermore, through the cash-for-clunkers program (scrappage program), those who wish to purchase an electric car will receive vouchers of over €5,000 total in return for their used car. For hybrid vehicles, with or without plug-in capabilities, a €550 grant is offered, plus an additional €160 grant for hybrid

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vehicles emitting under 100g/km of CO₂. Combined with the cash-for-clunkers program, the total grant is up to €2200. Electric and hybrid vehicles are exempt from the environmental tax, which also acts as a registration tax. From March 2015, electric vehicles are also exempt from the annual tax, while hybrid vehicles have a 95% reduction.

In 2016, the "Rabla Plus" program offered a government grant of €5,000 for the purchase of a new electric car. In 2017, the "Rabla Plus" grant program increased to EUR 10,000 for the purchase of a pure electric vehicle (BEV). Furthermore, car owners will receive an additional €1,400 if they end their registration of a car older than eight years.

1.3.21 Spain

Spain's government aimed to have 1 million electric cars on the roads by 2014 as part of a plan to cut energy consumption and dependence on expensive imports, Industry Minister Miguel Sebastián said.

In May 2011 the Spanish government approved a €72 million (US\$103 million) fund for year 2011 to promote electric vehicles. The incentives include direct subsidies for the acquisition of new electric cars for up to 25% of the purchase price, before tax, to a maximum of €6,000 per vehicle (US\$8,600), and 25% of the gross purchase price of other electric vehicles such as buses and vans, with a maximum of €15,000 or €30,000, depending on the range and type of vehicle. Several regional government grant incentives for the purchase of alternative fuel vehicles including electric and hybrid vehicles. In Aragón, Asturias, Baleares, Madrid, Navarra, Valencia, Castilla-La Mancha, Murcia, Castilla y León electric vehicles are eligible to a €6,000 tax incentive and hybrids to €2,000.

1.3.22 Sweden

In September 2011 the Swedish government approved a 200 million kr program, effective starting in January 2012, to provide a subsidy of 40,000 kr per car for the purchase of electric cars and other "super green cars" with ultra-low carbon emissions (below 50 grams of carbon dioxide per km). There is also an exemption from the annual circulation tax for the first five years from the date of their first registration that benefits owners of electric vehicles with an energy consumption of 37 kWh per 100 km or less, and hybrid vehicles with CO₂ emissions of 120 g/km or less. In addition, for both electric and hybrid vehicles, the taxable value of the car for the purposes of calculating the benefit in kind of a company car under personal income tax is reduced by 40% compared with the corresponding or comparable gasoline- or diesel-powered car. The reduction of the taxable value has a cap of 16,000 kr per year.

As of July 2014, a total of 5,028 new "super clean cars" had been registered in the country since January 2012, and because the government allocated funds for a total of 5,000 super clean cars between 2012 and 2014, the fund has been exhausted. BIL Sweden, the national association for the automobile industry, requested the government an additional 100 million kr to cover the subsidy for another 2,500 registrations of new super clean cars between August and December 2014. In December 2014 the Riksdagen, the Swedish parliament, approved an appropriation of 215 million kr to finance the super clean car subsidies in 2015. The appropriation for 2015, according to the parliamentary decision and subsequent government decision, was to also be used for the retroactive payment of the super green cars registered in 2014 that did not receive the subsidy.

The Government raised the appropriation for the super green car rebate by 132 million kr for 2015 and by 94 million kr for 2016. Beginning in 2016, only zero emissions cars are entitled to receive the full 40,000 kr premium, while other super green cars, plug-in hybrids, receive half premium. The exemption for the first five years of ownership from the annual circulation tax is still in place. In 2016, in order to promote the introduction of electricity-powered buses in the market, the Government planned to allocate 50 million kr for 2016 and 100 million kr per year between 2017 and 2019 to introduce an electric bus premium.

Two alternative proposals are being considered by the Swedish government regarding the introduction of a bonus-malus system. Both proposals entail changes to vehicle and car benefit taxation and the premium system for purchases of new cars. An official inquiry report was due by 29 April 2016. The goal is for the system to enter into force on 1 January 2017.

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1.3.23 Switzerland

Switzerland has a car import tax which is 4% of the purchase price (before adding the VAT) which is waived for electric cars. Since Switzerland consists of 26 cantons which have their own legislature, additional incentives for plug-in electric vehicles differ between the respective regions. The current list can be downloaded from the website of the Swiss Department of Energy.

There are no additional incentives on the actual purchase price, but some cantons offer road tax cuts. The Swiss road tax is a yearly recurring fixed amount calculated based on the specifications of the tax payers car. Currently, only the cantons Glarus (GL), Solothurn (SO), Ticino (TI) and Zurich (ZH) are completely waiving the tax for plug-in electric vehicles.

Calculation example for Zurich

Based on a usual car with the following specification:

- Engine: 2 L
- Total weight: 1800 kg
- Energy efficiency: C
- Year: 2013

The resulting tax to be paid per year will be 278 SFr.. Hence when calculating with a life expectancy of 10 years, the car owner in this example might save around 2,780 SFr. when buying a plug-in electric car.

However, since the tax on fossil fuels are relatively high in all European countries, including Switzerland, there is still an indirect, but quite strong incentive for car buyers to decide for energy efficient vehicles.

Based on the following examples:

- Fuel economy: 7.8 L/100 km (30 mpg_{US}) unleaded
- Driving habits: 15,000 km (9,300 mi) per year
- Fuel tax: 0.7312 SFr. per liter (2.7679 SFr. per gallon)
- Carbon tax (since January 1, 2014): 0.1414 SFr. per liter (0.5353 SFr. per gallon)

The resulting taxes on the burned fuels will be around 1,021 SFr. per year, which results in 10,210 SFr. over the car's 10-year lifetime.

1.3.24 United Kingdom

See also: Plug-in electric vehicles in the UK

1.3.24.1 Plug-in Car Grant

The Plug-in Car Grant started on 1 January 2011 and is available across the UK. The program reduces the up-front cost of eligible cars by providing a 25% grant towards the cost of new plug-in cars capped at GB£5,000 (US\$7,450). From 1 April 2015, the purchase price cap was raised to cover up to 35% discount of the vehicle's recommended retail price, up to the already existing GB£5,000 limit. This change means electric cars priced under GB£20,000 will be able to take advantage of most or all of the £5,000 discount. Both private and business fleet buyers are eligible for this grant, which is received at the point of purchase and the subsidy is claimed back by the manufacturer afterwards. The subsidy programme is managed in a similar way to the grant made as part of the 2009 Car Scrappage Scheme, allowing consumers to buy an eligible car discounted at the point of purchase with the subsidy claimed back by the manufacturer afterwards.





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The Tesla Roadster was available in the UK but not included on the government's plug-in electric car grant list of eligible vehicles.

The government announced in April 2014 that funding for the full grant of up to GB£5,000 will remain in place until either 50,000 grants have been issued or 2017, whichever is first. As forecasts estimated that the scheme will reach its 50,000 limit around November 2015, the government announced in August 2015 that the Plug-in Car Grant will continue until at least February 2016 for all plug-in cars with CO₂ emissions of 75 g/km of

under. The Government also announced that a minimum of GB£200 million (US\$311 million) has been made available to continue the Plug-in Car Grant.

Vehicles eligible for the subsidy must meet the following criteria:

- Vehicle type: Only ultra-low emission cars are eligible (vehicle category M1). Motorbikes, quadricycles and vans are not covered.
- Carbon dioxide exhaust emissions: Vehicles must emit equal or less than 75 grams of carbon dioxide (CO₂) per kilometre driven.
- Range: Electric vehicles (EVs) must be able to travel a minimum of 70 miles (110 km) between charges. Plug-in hybrid electric vehicles (PHEVs) must have a minimum all-electric range of 10 miles (16 km).
- Minimum top speed: Vehicles must be able to reach a speed of 60 miles per hour (97 km/h) or more.
- Warranty: Vehicles must have a 3-year or 60,000 miles (97,000 km) vehicle warranty (guarantee) and a 3-year battery and electric drive train warranty, with the option of extending the battery warranty for an extra 2 years ('drive train' means the parts that send power from the engine to the wheels. These include the clutch, transmission (gear box), drive shafts, U-joints and differential).
- Battery performance: Vehicles must have either a minimum 5-year warranty on the battery and electric drive train as standard, or extra evidence of battery performance to show reasonable performance after 3 years of use
- Electrical safety: Vehicles must comply with certain regulations (UN-ECE Reg 100.01) that show that they are electrically safe.
- Crash safety: To make sure cars will be safe in a crash, they must either have: EC whole vehicle type approval (EC WVTA, not small series) or evidence that the car has appropriate levels of safety as judged by international standards.

In February 2015 the government announced that to take account of rapidly developing technology, and the growing range of ULEVs on the British market, the criteria for the plug-in car grant was updated and from April 2015, eligible ultra-low emission vehicles (ULEVs) must meet criteria in one of the following categories depending on emission levels and zero-emission-capable mileage, with a technology neutral approach, which means that hydrogen fuel cell cars are also eligible for the grant:

- Category 1: CO₂ emissions of less than 50g/km and a zero emission range of at least 70 mi (110 km).
- Category 2: CO₂ emissions of less than 50g/km and a zero emission range between 10 to 69 mi (16 to 111 km).

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- Category 3: CO₂ emissions of 50-75g/km and a zero emission range of at least 20 mi (32 km).

In December 2015, the Department for Transport (DfT) announced that Plug-in car grant was extended until March 2018 to encourage more than 100,000 UK motorists to buy cleaner vehicles. A total funding of GB£400 million (~US\$600 million) is available for the extension. To reflect the changes in the British market, the criteria for the Plug-in Car Grant was updated and the maximum grant drops from GB£5,000 (~US\$7,450) to GB£4,500 (~US\$6,700). For the extension, the amount of the grant is linked in directly with the Office for Low Emission Vehicles three vehicle categories issued in April 2015. The eligible ultra-low emission vehicles (ULEVs) must meet criteria in one of three categories depending on emission levels (CO₂ emissions bands between 50 and 75g/km) and zero-emission-capable mileage (minimum of 10 mi (16 km)), with a technology neutral approach, which means that hydrogen fuel cell cars are eligible for the grant. The updated scheme went into force on 1 March 2016.

A price cap is in place, with all Category 1 plug-in vehicles eligible for the full grant no matter what their purchase price, while Category 2 and 3 models with a list price of more than GB£60,000 (~US\$90,000) are eligible for the grant. Vehicles with a zero-emission range of at least 70 mi (110 km) (category 1), including hydrogen fuel cell vehicles, get a full GB£4,500 (~US\$6,700), but plug-in hybrids (categories 2 and 3) costing under GB£60,000 (~US\$90,000) receive GB£2,500 (~US\$3,725). Under the extended scheme, some plug-in hybrid sports car are no longer be eligible for the grant, such as the BMW i8 because of its GB£100,000 (~US\$150,000) purchase price tag. The grant scheme will come under review when a cumulative total of 40,000 Category 1 claims, and 45,000 Category 2 and 3 combined sales have been made. Both these totals will include cars sold before March 2016.

As of October 2016, the following 31 cars available in the British market are eligible for the grant according to their category:

Eligible category 1 vehicles

BMW i3, BYD e6, Citroen C-Zero, Ford Focus Electric, Hyundai Ioniq Electric, Kia Soul EV, Mahindra e2o, Mercedes-Benz B-Class Electric Drive, Nissan e-NV200 5- and 7-seater Combi, Nissan Leaf, Peugeot iOn, Renault Fluence Z.E., Renault Zoe, Smart Fortwo electric drive, Tesla Model S, Toyota Mirai, Volkswagen e-Golf, and Volkswagen e-Up!



Plug-in hybrid models with a list price of over GB£60,000, such as the BMW i8, are no longer eligible for the Plug-in Car Grant from March 2016.

Eligible category 2 vehicles

Audi A3 e-tron (MY 2016 only), BMW 225xe, BMW 330e, Kia Optima PHEV, Mercedes-Benz C350 e, Mitsubishi Outlander P-HEV (except GX3h 4Work), Toyota Prius Plug-in Hybrid, Vauxhall Ampera, Volkswagen Golf GTE, Volkswagen Passat GTE, Volvo V60 Plug-in Hybrid (D5 and D6 Twin

Engine), and Volvo XC90 T8 Twin Engine Momentum.

Ineligible vehicles

Category 2 or 3 vehicles with a recommended retail price over £60,000 aren't eligible for a grant. This includes: BMW i8 (category 2), Mercedes-Benz S500 Plug-in Hybrid (category 3), and Porsche Panamera S E-Hybrid (category 3).

The Tesla Roadster was not included in the government's list of eligible vehicles for the plug-in electric car grant. Tesla Motors stated that the company applied for the scheme, but did not complete its application.

In addition to the extension of the Plug-in Grant, the government also announced it will continue the "Electric Vehicle Homecharge Scheme." Starting in March 2016 owners of ultra-low emission vehicles who install a dedicated

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charge point at their home, covering roughly half the average cost, will get GB£500 (~US\$750) towards the cost of installing the charging point, rather than the previous GB£700 (~US\$1,050) maximum.

1.3.24.2 Plug-in Van Grant

The Mercedes-Benz Vito E-Cell is eligible for the Plug-In Grant.

The Plug-In Car Grant began in February 2012. Van buyers can receive 20% - up to GB£8,000 - off the of a plug-in van. To be eligible for the scheme, vans to meet performance criteria to ensure safety, range, and ultra-low tailpipe emissions. Consumers, business and private will receive the discount at the of purchase. The Plug-In Van Grant scheme was extended in October 2016 to make electric trucks above 3.5 tonnes eligible for grants of up to GB£20,000, when businesses switch their large trucks to an electric vehicle. The government also announced their commitment for an additional GB£4 million to the scheme so that all vans and trucks meeting the eligibility requirements can benefit from the grant scheme. The extension of the Plug-In Van grant means that N2 vans (3.5 – 12 tonnes gross weight) and N3 vans (over 12 tonnes gross weight) are now eligible.



Van

cost
have

both
point

The eligibility criteria for vans with a gross weight of 3.5 tonnes or less (N1 van) are:

- Vehicle type: only new N1 vans are eligible. This includes pre-registration conversions (normal, internal combustion engine vans that were converted to battery or hybrid versions by specialist converters before the car's first registration).
- Carbon dioxide exhaust emissions: vehicles must emit less than 75 grams of carbon dioxide (CO₂) per kilometre driven.
- Range: eligible fully electric vans must be able to travel a minimum of 60 mi (97 km) between charges. Plug-in hybrid electric vehicles (PHEVs) must have a minimum electric range of 10 miles (16 km).
- Minimum top speed: vehicles must be able to reach a speed of 50 mph (80 km/h) or more.
- Warranty: Vehicles must have a 3-year or 60,000 mi (97,000 km) vehicle warranty (guarantee) and a 3-year battery and electric drive train warranty, with the option of extending the battery warranty for an extra 2 years
- Battery performance: vehicles must have either a minimum 5-year warranty on the battery and electric drive train as standard

or extra evidence of battery performance to show reasonable performance after 3 years of use

- Electrical safety: vehicles must comply with certain regulations (UN-ECE Reg 100.00) that show that they are electrically safe.
- Crash safety To make sure cars will be safe in a crash, they must either have EC whole vehicle type approval (EC WVTA, not small series) or evidence that the car has appropriate levels of safety as judged by international standards.

As of December 2016, the number of claims made through the Plug-in Van Grant scheme totaled 2,938 units since the launch of the programme in 2012, up from 1,906 made by the end of December 2015. As of October 2016 the following nine vans are eligible for the grant: BD Otomotive eTraffic, BD Otomotiv eDucato, Citroën

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Berlingo, Mercedes-Benz Vito E-Cell, Mitsubishi Outlander GX3h 4Work, Nissan e-NV200, Peugeot ePartner, Renault Kangoo Z.E., and Smith Electric Edison.

1.3.24.3 Number of beneficiaries

The number of eligible registered plug-in electric vehicles passed the 25,000 unit milestone in January 2015. As of March 2017, the number of eligible registered plug-in electric cars that have benefited with the subsidy totaled 94,541 units since the launch of the programme in 2011. As of December 2016, the number of claims made through the Plug-in Van Grant scheme totaled 2,938 units since the launch of the programme in 2012. About 90,000 plug-in electric vehicles have been registered in the UK up until December 2016, including over 85,000 plug-in hybrids and all-electric cars, and about 4,000 plug-in commercial vans. Not all vehicles were eligible for the grant schemes.

1.3.24.4 Plugged-in Places

On 19 November 2009, Andrew Adonis, the Secretary of State for Transport, announced a scheme called "Plugged-in-Places", making available £30 million to be shared between three and six cities to investigate further the viability of providing power supply for electric vehicles, and encouraging local government and business to participate and bid for funds.

The UK government is supporting the "Plugged-In Places" program to install vehicle recharging points across the UK. The scheme offers match-funding to consortia of businesses and public sector partners to support the installation of EV recharging infrastructure in lead places across the UK. There are eight Plugged-In Places: East of England; Greater Manchester; London; Midlands; Milton Keynes; North East;

Northern Ireland; and Scotland. The Government also published an Infrastructure Strategy in June 2011.

1.3.24.5 London congestion charge

All-electric vehicles (BEVs) and eligible plug-in hybrid electric vehicles (PHEVs) qualify for a 100% discount from the London congestion charge. A plug-in electric drive vehicle qualifies if the vehicle is registered with the Driver and Vehicle Licensing Agency (DVLA) and has a fuel type of 'electric', or alternatively, if the vehicle is a 'plug-in hybrid' and is on the Government's list of PHEVs eligible for the OLEV grant. As of February 2015, approved PHEVs include all extended-range cars such as the BMW i3 with range extender and Vauxhall Ampera, and plug-in hybrids that emit 75g/km or less of CO₂ and that meet the Euro 5 standard for air quality, such as the Audi A3 Sportback e-tron, BMW i8, Mitsubishi Outlander P-HEV, and Toyota Prius Plug-in Hybrid.

The original Greener Vehicle Discount was substituted by the Ultra Low Emission Discount (ULED) scheme that went into effect on 1 July 2013. The ULED introduced more stringent emission standards that limited the free access to the congestion charge zone to any car or van that emits 75g/km or less of CO₂ and meets the Euro 5 emission standards for air quality. As of July 2013 there are no internal combustion-only vehicles that meet this criteria. The measure is designed to limit the growing number of diesel vehicles on London's roads. Mayor Boris Johnson approved the new scheme in April 2013, after taking into account a number of comments received during the 12-week public consultation that took place. About 20,000 owners of vehicles registered for the Greener Vehicle Discount by June 2013 were granted a three-year sunset period (until 24 June 2016) before they have to pay the full congestion charge.

1.4 North America

1.4.1 Canada

Nissan Leaf, Smart electric drive, and Mitsubishi i MiEV (from farthest to closest) electric cars in downtown Toronto.

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1.4.1.1 Ontario

The Ontario Ministry of Transportation (MTO) established the Electric Vehicle Incentive Program (EVIP) in 2010 and updated it on January 1, 2017 in response to the province's Climate Change Action Plan. To qualify, Battery Electric Vehicles (BEVs) and Plug-In Hybrid Electric Vehicles (PHEVs) must be purchased or leased in Ontario and owned or leased for at least 12 months. Leased vehicles with 12 month terms receive 33% of the incentive, 24-month lease terms receive 66%, and lease terms 36 months or longer receive the full incentive. Vehicles must be on the EVIP list to qualify. Those with a Manufacturer's Suggested Retail Price (MSRP) of CA\$150,000 or greater are not eligible for the incentive. Electric vehicles with a battery size of 5 -16 kWh are eligible for incentives from CA\$6,000 to CA\$10,000. Vehicles with a battery size exceeding 16 kWh qualify for CA\$9,000 to CA\$13,000. Vehicles with five or more seats are eligible for an additional CA\$1,000. Demonstration vehicles under a specified mileage and used exclusively for test drives at dealerships or leasing companies are also eligible. PHEVs with an MSRP of CA\$75,000 to CA\$150,000 qualify for a maximum incentive of CA\$3,000. Applications for incentives must be submitted within 3 months of the vehicle's provincial registration.



Ontario has also introduced green-coloured license plates for use on BEVs and PHEVs. These unique green vehicle plates permit electric vehicle owners to travel in the province's carpool lanes regardless of the number of passengers in the vehicle. Drivers are also allowed to use recharging stations at GO Transit and other provincially owned parking lots.

EVIP is financed by proceeds from Ontario's participation with Quebec and California in a cap-and-trade program.

1.4.1.2 Quebec

Quebec began offering rebates of up to CA\$8,000 (~ US\$8,358) beginning on January 1, 2012, for the purchase of new plug-in electric vehicles equipped with a minimum of 4 kWh battery, and new hybrid electric vehicles were eligible for a CA\$1,000 rebate. All-electric vehicles with high-capacity battery packs were eligible for the full CA\$8,000 rebate, and lower incentives were set for low-range electric cars and plug-in hybrids. Quebec's government earmarked CA\$50 million (~ US\$49.9 million) for the program, and the maximum rebate amount was set to be slowly reduced every year until a maximum of CA\$3,000 in 2015, but the rebates would continue until the fund runs out. There was also a ceiling for the maximum number of eligible vehicles: 10,000 for all-electric vehicles and plug-in hybrids, and 5,000 for conventional hybrids.



Mitsubishi i MiEV from Hydro-Québec showcased at the 2012 Montreal International Auto Show.

In November 2013, the provincial government announced its decision to earmark in 2014 an additional CA\$65 million (~ US\$45.5 million) to fund a three-year extension to the electric-vehicle rebate program. The maximum rebate was kept at CA\$8,000, but a graded scale was introduced in order to spread the incentive over 10,000 or more vehicles. Quebec's government also set the goal to deploy 12,500 more electric vehicles in

the province by 2017, consisting of 10,200 consumer cars, 325 taxis, and 2,000 government-fleet vehicles. Also, incentives were issued for "greening" 525 taxis, aimed to introduce 325 plug-in vehicles (275 plug-in hybrids and 50 all-electrics) and 200 conventional hybrids. The purchase incentives start at CA\$20,000 for battery-electric taxis, CA\$12,000 for plug-in hybrids, and CA\$3,000 for conventional hybrids, with the rebate declining over time. The province planned to also subsidize 125 Level 2 stations for the taxi industry, paying 75% of the cost up to CA\$5,000, and pay for the majority of costs to fund 10 Level 3 chargers for taxis.

Also in 2013, the provincial government announced its support to deploy 5,000 new charging stations. A total of 500 stations were to be located around various cities and along the province's so-called Electric Circuit route, another

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1,000 near government buildings, and 3,500 at various workplaces for employee use. Businesses are eligible for a 75% rebate on installation costs up to CA\$5,000 for Level 1 or Level 2 charging stations. In addition, a 50% rebate will continue to be offered to individuals for installation of home charging stations, with a maximum of CA\$1,000. Also the government announced an initiative for the gradual electrification of the provincial government's own vehicle fleet. The goal is to replace vehicles of the provincial government's 34 ministers (cabinet-level officials) with plug-in hybrid or pure electric vehicles by March 2017. The government expects to bring 2,000 plug-in vehicles into the provincial fleet over the same time.

In October 2016, the National Assembly of Quebec passed a new zero emission vehicle legislation that obliges any carmaker who sells in the Canadian province more than 4,500 new vehicles per year over a three-year average, to offer their customers a minimum number of plug-in hybrid and all-electric models. Under the new law, 3.5% of the total number of autos sold by carmakers in Quebec have to be zero emissions vehicles (ZEV) starting in 2018, rising to 15.5% in 2020. A tradable cr system was created for those carmakers not fulfilling their quotas to avoid financial penalties. The quotas will be determined by Quebec's Ministry of Sustainable Development. Quebec became the first Canadian province to pass such legislation, joining ten U.S. states, including California, that have similar ZEV laws. Quebec aims to have 100,000 zero emission vehicles on the road by 2020. Initially, the provincial government set the goal in 2011 to have 300,000 plug-in vehicles on the roads by 2020.

1.4.1.3 British Columbia

Tesla Model S charging in Parksville, British Columbia.

As of April 1, 2015, British Columbia's Clean Energy Vehicle (CEV) Program incentives for CEV purchase were renewed with funding for approximately 1250 to 1500 vehicles. This program will expire on March 31, 2018, or when the CA\$6,355,000 in new funding is depleted. The current levels of incentives are: CA\$5,000 for an EV (min.15 kWh capacity), CA\$2,500 for a plug-in hybrid or an extended range vehicle with a smaller battery capacity (min. 4 kWh capacity) and up to CA\$6,000 for hydrogen fuel cell vehicles, these amounts may be reduced annually. All vehicles must be new and purchased in BC, each claim is processed by the dealer at the Point of Sale and deducted from the vehicle price. The previous program that provided funding to cover part of the cost of installing home EV charging equipment has been discontinued. There is also a separate provincially funded "SCRAP-IT" program with incentives for scrapping model year 2000 or earlier, conventional gas powered vehicles. Basic incentives range from bus passes to coop car-share membership crs, or CA\$200 in cash. However, there is also the option of applying for a CA\$3,000 rebate cheque (plus CA\$250 off the Point of Sale purchase price) when buying a new or used EV (min.15 kWh capacity). The "SCRAP-IT" rebate program currently brings the combined provincial incentives available to buyers of a qualifying new EV in BC to CA\$8,250.



The Government of British Columbia had announced the *LiveSmart BC* program, which started offering rebates of up to CA\$5,000 per eligible clean energy vehicle commencing on December 1, 2011. The incentives were available until March 31, 2013 or until available funding were depleted, whichever came first. Available funds were enough to provide incentives for approximately 1,370 vehicles. Battery electric vehicles, fuel cell vehicles and plug-in hybrids with battery capacity of 15.0 kWh and above are eligible for a CA\$5,000 incentive. Also effective December 1, 2011, rebates of up to CA\$500 per qualifying electric vehicle charging equipment were available to B.C. residents who had purchased a clean energy vehicle. As of February 14, 2014, the Point of Sale Incentive Program and Residential Electric Charging Station Program had depleted their budgets and were no longer accepting applications for rebates prior to the Point of Sale incentive program being re-funded in April 2015.

1.4.2 Mexico

Mexico has set a minimum goal of clean energies as part of the electric power generation mix in for the next years (25% in 2018, 30% in 2021 and 35% in 2024) as a strategy to reach Greenhouse Gases (GHG) emission cuts. Energy efficiency is also regarded as one of the greater cost-benefit potential alternatives to achieve GHG reduction. Moreover, the transport sector in Mexico represents 44.7% of the total final consumption of

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energy, almost 17% more than the world average (28%). Thus, replacing low fuel efficient transport with alternative fuels is regarded as a considerable contribution to reduce 50% of its GHG emissions by the year 2050, as established by the General Law on Climate Change commitments. Therefore, incentives for PHEVs have been created both at regional and federal levels to decrease cost of ownership for the end-consumers.

Minimum fuel efficiency by vehicle class

Vehicle Class	Minimum Fuel Efficiency (km/l)
Subcompact	16.43
Compact	14.39
Multiple use	9.7
Light truck class 1	8.61
Light truck class 2	8.51

1.4.2.1 Federal

In Mexico, there are several existing incentives regarding Plug-in Hybrid Electric Vehicles (PHEV) at a federal level. Fiscal incentives for end-consumers include higher daily lease tax deductions per car (\$285 versus \$200 MXN), higher tax deduction caps per car (\$250,000 versus \$175,000 MXN), and fiscal crs for up to 30% of investments for charging stations located in public places. Furthermore, PHEVs are exempt of the tax on new vehicles (paid by the manufacturer, assembler or dealer).

Also, the electrical power service contract for residential charging stations can be independent of household consumption under a commercial rate, which can save up to 40% on electricity compared to consolidating billing in the same meter.

1.4.2.2 Regional

In Mexico City, Mexico State and Jalisco, PHEVs are exempt from vehicular emission verification. They can instead obtain an exempt hologram which unbounds them from the restrictions imposed by the vehicular emission verification programs, which limits car usage. PHEVs are also exempt of the annual ownership vehicle tax in Baja California, Durango, Mexico City, Mexico State, Nayarit, Tlaxcala and Queretaro. In Mexico City, they also have right to a 50% discount on other contributions (permits, concessions, registry, etc.), and models from 2002 to 2017 pay only an endorsement right for vehicle control services. Finally, in Mexico City, PHEVs also have preferential parking in private and public parking lots.

1.4.2.3 Charging station network

EVstation (Parque España, Mexico City). Evstations are free charging stations for PHEVs and electric devices (bicycles, motorcycles and mobiles). The service is provided by Imágenes y Muebles Urbanos (IMU), owners of the stations, and was

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approved by the Ministry of Urban Development and Housing and the Ministry of Mobility. 28 spots exist throughout Mexico City.

As of January 2017, in Mexico there were 700 public access charging stations for PHEVs that are privately owned. The Ministry of Energy and the state owned electric power utility, Comision Federal de Electricidad, will destine \$25 million MXN to install 100 more charging stations through 2017-2018 in the metropolitan areas

of Guadalajara, Monterrey and Mexico City. As of now, users of the existing network can charge their PHEVs for free, as the cost of electricity is absorbed by the owners of the establishments where the charging stations are located.

1.4.3 United States

See also: Plug-in electric vehicles in the United States

1.4.3.1 Federal government

The Chevrolet Volt (top) and the Nissan Leaf (bottom) are PEVs eligible for a U.S. federal tax credit up to US\$7,500, and additional incentives in several states.



In his 2011 State of the Union address, President Barack Obama set the goal for the U.S. to become the first country to have one million electric vehicles on the road by 2015. For this purpose, his administration pledged US\$2.4 billion in federal grants to support the development of next-generation electric vehicles and batteries. The funds were allocated as follows: \$1.5 billion in grants to U.S. based manufacturers to produce highly efficient batteries and their components; up to \$500 million in grants to U.S. based manufacturers to produce other components needed for electric vehicles, such as electric motors and other components; and up to \$400 million to demonstrate and evaluate plug-in hybrids and other electric infrastructure concepts—like truck stop charging station, electric rail, and training for technicians to build and repair electric vehicles (greencollar jobs).

Considering that actual plug-in car sales were lower than initially expected, as of early 2013, several industry observers have concluded that Obama's one million goal was unattainable. As of December 2016, approximately 542,000 EVs have been sold to date in the U.S. According to a July 2012 study by Pike Research, cumulative sales will reach the one million goal set by the Obama Administration only in 2018. Other analysts agree that the goal could be achieved in 2018. With only about 400,000 plug-in electric cars sold in the United States by the end of December 2015, Secretary of Energy, Ernest Moniz, said in January 2016 that the one million goal may not be reached until 2020. According to the Secretary purchases have fallen well below President Barack Obama's goal due to low gasoline prices, which had a negative impact on sales. Also improvements in battery technology are required as lowering battery costs is "absolutely critical" to boost electric vehicle sales. U.S. cumulative plug-in sales since 2008 achieved the 500,000 unit milestone in August 2016.

New plug-in electric vehicles

Plug-in electric drive conversion are also eligible for a maximum \$4,000 federal tax credit. Shown here are normal Toyota Priuses that were converted to Plug-in hybrids recharging in San Francisco.

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The Energy Improvement and Extension Act of 2008 granted tax crs for new qualified plug-in electric drive motor vehicles. The American Recovery and Reinvestment Act of 2009 (ARRA) also authorized federal tax crs for converted plug-ins, though the cr is lower than for new PEVs. The 2009 ACES also has extensive provisions for electric cars. The bill calls for all electric utilities to, "develop a plan to support the use of plug-in electric drive vehicles, including heavy-duty hybrid electric vehicles". The bill also provides for "smart grid integration," allowing for more efficient, effective delivery of electricity to accommodate the additional demands of plug-in EVs. Finally, the bill allows for the Department of Energy to fund projects

that support the development of EV and smart grid technology and infrastructure.

Federal tax cr numbers, July 2017

Brand	Number
General Motors	142,961
Tesla	121,410
Nissan	110,845
Ford	94,681
Toyota	58,288

As defined by the 2009 ACES Act, a PEV is a vehicle which draws propulsion energy from a traction battery with at least 4 kwh of capacity and uses an offboard source of energy to recharge such battery. The tax cr for new plug-in electric vehicles is worth \$2,500 plus \$417 for each kilowatt-hour of battery capacity over 4 kwh, and the portion of the cr determined by battery capacity cannot exceed \$5,000. Therefore, the maximum amount of the cr allowed for a new PEV is \$7,500. Both the Nissan Leaf electric vehicle and the Chevrolet Volt plug-in hybrid, launched in December 2010, are eligible for the maximum \$7,500 tax cr. The Toyota Prius Plug-in Hybrid, released in January 2012, is eligible for a \$2,500 tax cr due to its smaller battery capacity of 5.2 kWh. All Tesla cars and Chevrolet Bolts are eligible for the 7,500 tax cr.

As granted by the 2009 ACES Act, electric vehicles produced after 2010 are eligible for an IRS tax cr from \$2,500 to \$7,500. There are some limitations and rules however that go along with the applied tax cr from electric vehicles. When an electric vehicle is leased, the tax cr is held by the manufacturer offering the lease, not by the lessee. Other restrictions that affect EV tax cr include: limitation of cr for electric vehicles used in reselling purposes, terms requiring the vehicle to remain in the United States, and production by qualified sellers. These granted tax crs on EV vehicles will phase out once 200,000 plug-in vehicles are sold in the U.S. Some producers will experience an expiration in that mark of 200,000 sold EV vehicles earlier than expected, such as Tesla, which is expected to reach

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its 200,000 sales point in its 2nd quarter of 2018. During this “phase out” period after 200,000 EV car sales, qualified producers will experience a drop in a tax cr of \$7,500 to \$3,750 for the next 6 months followed by a drop to \$1,875 for another 6 months until the cr is ran out completely.

Phaseout

Example

200,000th plug-in electric drive vehicle produced by the manufacturer on February 12, 2010.

Phase out starts beginning of second calendar quarter after 200,000-vehicle mark reached.

Beginning of fourth calendar quarter after 200,000-vehicle mark reached, credit decreases again.

Credit ends beginning sixth calendar quarter.

Full Credit Amount			50% of Full Amount			25% of Full Amount			No Credit		
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010						2011					

The qualified plug-in electric vehicle cr phases out for a PEV manufacturer over the one-year period beginning with the second calendar quarter after the calendar quarter in which at least 200,000 qualifying vehicles from that manufacturer have been sold for use in the U.S. Cumulative sales started counting sales after December 31, 2009. After reaching the cap, qualifying PEVs for one quarter still earn the full cr, the second quarter after that quarter PEVS are eligible for 50% of the cr for six months, then 25% of the cr for another six months and finally the cr is phased out.

Studies

A 2013 study published in the journal *Energy Policy* determined that current federal subsidies are "not aligned with the goal of decreased gasoline consumption in a consistent and efficient manner." In particular, hybrid-vehicle cr is given according to battery capacity rather than on the vehicle's all-electric range. Across the battery-capacity and charging-infrastructure scenarios examined, the lowest-cost solution is for more drivers to switch to traditional hybrid electrics or low-capacity plug-in hybrid electric vehicles (PHEVs). Installing charging infrastructure would provide lower gasoline savings per dollar spent than paying for increased PHEV battery capacity.

A 2016 study conducted by researchers from the University of California, Davis found that the federal tax cr was the reason behind more than 30% of the plug-in electric sales. The impact of the federal tax incentive is higher among owners of the Nissan Leaf, with up to 49% of sales attributable to the federal incentive. The study, based on a stated preference survey of more than 2,882 plug-in vehicle owners in 11 states, also found that the federal tax cr shifts buyers from internal combustion engine vehicles to plug-in vehicles and advances the purchase timing of new vehicles by a year or more.

Plug-in conversion kits

The 2009 ARRA provided a tax cr for plug-in electric drive conversion kits. The cr is equal to 10% of the cost of converting a vehicle to a qualified plug-in electric vehicle and in service after February 17, 2009. The maximum amount of the cr is \$4,000. The cr does not apply to conversions made after December 31, 2011.

Charging equipment

There was (through 2010) a federal tax cr equal to 50% of the cost to buy and install a home-based charging station with a maximum cr of US\$2,000 for each station. Businesses qualified for tax crs up to \$50,000 for larger installations. These crs expired on December 31, 2010, but were extended through 2013 with a reduced tax cr equal to 30% with a maximum cr of up to US\$1,000 for each station for individuals and up to US\$30,000 for commercial buyers.

New proposals

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An initiative by the Obama Administration to increase the maximum tax cr for plug-in electric vehicles to US\$10,000, would not apply to luxury vehicles with a sales price of over US\$45,000, such as the Cadillac ELR (shown) and the Tesla Model S.

Two separate initiatives were pursued in 2011 to transform the tax cr into an instant cash rebate; these did not pass. The objective of both initiatives was to make new qualifying plug-in electric cars more accessible to buyers by making the incentive more effective. The rebate would have been available at the point of sale allowing consumers to avoid a wait of up to a year to apply the tax cr against income tax returns. The first initiative was from Senator Debbie Stabenow who reintroduced the "Charging America Forward Act." This bill was introduced in August 2010 but was not voted by the full Senate. The bill would have turned the tax cr into a rebate worth up to US\$7,500 for plug-in electric vehicles and also would have provided businesses with a tax cr for purchasing medium or heavy duty plug-in hybrid trucks. The other initiative was from the Obama Administration and was submitted in the FY2012 Budget as a provision to transform the existing cr into a rebate that would have been claimable by dealers and passed along to the consumers, this was not included in the Budget.

Another change plug-in tax cr was proposed by Senator Carl Levin and Representative Sander Levin who proposed to raise the existing cap on the number of plug-in vehicles eligible for the tax cr. The proposal would have raised that limit from the existing 200,000 PEVs per manufacturer to 500,000 units, this was not passed.

In March 2014 the Obama Administration included a provision in the FY2015 Budget to increase the maximum tax cr for plug-in electric vehicles and other advanced vehicles to US\$10,000. However, the new maximum tax cr would not apply to luxury vehicles with a sales price of over US\$45,000, which would be capped at US\$7,500. The proposal sought to remove the 200,000 vehicle cap per manufacturer after which the cr phases out over a year. Instead, the incentives would begin to phase out—falling to 75% of the current cr—starting in 2019 for all manufacturers, and would be completely phased out by 2022; this did not get included in the Budget.

In November 2017, House Republicans proposed scrapping the \$7,500 tax cr as part of a sweeping tax overhaul.

1.4.3.2 In California

See also: Government incentives for plug-in electric vehicles in California

The Tesla Model S is eligible for a US\$7,500 federal tax cr and a rebate in California, depending on income.

The Clean Vehicle Rebate Project (CVRP), initially funded with a total of US\$4.1 million by the California Environmental Protection Agency's Air Resources Board (ARB), was established in order to promote the production and use of zero-emission vehicles (ZEVs), including plug-in electric and fuel cell vehicles. The program was created from Assembly Bill 118 that was signed by Governor Schwarzenegger in October 2007. The funding is provided on a first-come, first-served basis, and the project is expected to go through 2015.



Besides a US\$2,500 federal tax cr, the Toyota Prius Plug-in Hybrid is eligible for a rebate in California, depending on income.

Eligible vehicles include only new ARB-certified or approved zero-emission or plug-in hybrid electric vehicles. A list of eligible vehicles can be found on the California Center for Sustainable Energy web site. Among the eligible vehicles

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are neighborhood electric vehicles, battery electric, plug-in hybrid electric, and fuel cell vehicles including cars, trucks, medium- and heavy-duty commercial vehicles, and zero-emission motorcycles. Vehicles must be purchased or leased on or after March 15, 2010. Rebates of up to \$5,000 per light-duty vehicle are available for individuals and business owners who purchase or lease new eligible vehicles. Certain zero-emission commercial vehicles are also eligible for rebates up to \$20,000.



The 2012 Chevrolet Volt fitted with a low emissions package qualifies in California for the US\$1,500 CVRP rebate and since February 2012 have free access to high-occupancy vehicle lanes.

As of early September 2012, private individuals accounted for 88% of rebate funds reimbursed. As of early March 2013, CARB has issued about 18,000 rebates totaling US\$41 million. However, CARB notices that

approximately 2,300 Chevrolet Volts were sold in California before the Volt became eligible for the rebate in February 2012. As a result of the rebate and other existing incentives, such as allowing solo drivers in HOV lanes, California is the leading PEV market in the United States with about 40% of all new plug-in electric vehicles sold nationwide during 2011 and 2012, while the state represents about 10% of all new car sales in the country.

As of 10 March 2014, a total of 52,264 clean vehicle rebates have been issued by the CVRP, for a total of US\$110,222,866 disbursed, with only US\$3.8 million remaining for fiscal year 2013-2014. As of April 2014, the CVRP was facing an estimated US\$30 million funding shortfall for the 2013-14 fiscal year, and uncertainty about additional funding for the 2014-15 fiscal year. CARB staff presented a proposal to the board to overcome the funding shortage and also to facilitate the rebates to benefit buyers in disadvantaged communities who live in areas with bad air quality or who can't afford high-end electric cars.

A bill signed into law in September 2014, mandated the CARB to draft a financial plan to meet California's goal of putting one million vehicles on the road while making sure that disadvantaged communities can participate. CARB had to change the Clean Vehicle Rebate program to provide an extra cr for low-income drivers who wish to purchase or lease an electric car. CARB also provides assistance to carsharing programs in low-income neighborhoods and install charging stations in apartment buildings in those communities. Under bill SB 1275, low-income residents who agree to scrap older, polluting cars will also get a clean vehicle rebate on top of existing payments for junking smog-producing vehicles.

Another bill signed into law in September 2014, AB 1721, grants clean air vehicles free or reduced rates in high-occupancy toll lanes (HOT) lanes. AB 2565 facilitates access to charging stations by requiring commercial and residential property owners to approve installation if the charging station meets requirements and complies with the owner's process for approving a modification to the property.

As of 29 March 2016, California added income-based caps to its rebate system. Buyers with incomes less than 300% of the Federal poverty level will get up to US\$3,000 for a plug-in hybrid, US\$4,000 for an all-electric car, and US\$6,500 for a hydrogen fuel-cell car and the rebate scales down until Californian buyers with incomes over US\$250,000 are no longer are eligible for incentives on hybrids or electric cars, however can get US\$5,000 for a hydrogen fuel-cell car. As of March 2016, the Center for Sustainable Energy has issued more than \$291 million in the CVRP for over 137,200 vehicles since 2010.

The income-base caps went into effect on 1 November 2016. Residents will not be eligible for rebates if their gross annual income exceeds US\$150,000 for single tax filers, US\$204,000 for head of household filers and US\$300,000 for joint filers. These limits do not apply to the purchase of fuel cell electric vehicles, which represent less than 1% of rebate applications.

The standard tax crs (on eligible cars) are \$1,500 for plug-in hybrids, \$2,500 for all-electrics, and \$5,000 for fuel cell cars.

Access to HOV lanes

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California's green Clean Air Vehicle sticker for plug-in hybrids



California's white Clean Air Vehicle sticker for all-electric cars

In California a vehicle that meets specified emissions standards may be issued Clean Air Vehicle (CAV) decals that allow the vehicle to be operated by a single occupant in California's high-occupancy vehicle lanes (HOV), or carpool or diamond lanes. All-electric vehicles are classified as Federal Inherently Low Emission Vehicles (ILEVs), and as zero emissions vehicles are entitled to an unlimited number of white CAV stickers. Green CAV stickers were initially available to a limited number of applicants that purchased or leased cars meeting California's Enhanced Advanced Technology Partial Zero Emission Vehicle (Enhanced AT PZEV) or Transitional Zero-Emission Vehicle (TZEV) requirements, for which plug-in hybrids classify. The green car sticker cap was increased several times, and since September 2016 the cap was removed.

Research performed in 2015 by the UCLA Luskin Center for Innovation found that access to HOV lanes has a significant impact on plug-in car sales. Researchers linked automobile sales to a sample of more than 7,000 of the 8,057 census tracts in California for the study, including Los Angeles, Sacramento, San Diego and San Francisco. The study concluded that the ability to use potentially time-saving HOV lanes prompted the purchase of more than 24,000 plug-in electric cars and hybrids in the four urban areas from 2010 to 2013, or about 40% of the total of such vehicles. The UCLA researcher concluded that without the policy giving plug-in vehicles access to HOV lanes, total plug-in sales in the same study areas would have been only 36,692 for the three-year period.

1.4.3.3 All states

Main article: Plug-in electric vehicles in the United States § State incentives

As of November 2014, 37 states and Washington, D.C. have established incentives and tax exemptions for BEVs and PHEVs, or utility-rate breaks, and other non-monetary incentives such as free parking and high-occupancy vehicle lane access. All states are eligible for the \$7,500 income tax cr.

1.5 Australia

1.5.1 Federal incentives

In Australia, the Federal Government offers no direct incentives for electric vehicle ownership and imposes a substantial financial *disincentive* by way of a Federal Luxury Car Tax that is applied on new vehicles valued over a certain threshold (in 2014–15, this was A\$61,884). The application threshold for this tax is increased to A\$75,375 for fuel efficient vehicles - defined as those with a fuel consumption rating under 7 litres per 100 kilometres. By definition, electric vehicles which do not use conventional fuel sources are covered by this classification.

1.5.2 State and Territory incentives

Motor vehicle registrations in Australia are the responsibility of the state and territory governments. Two of these jurisdictions offer incentives or rebates for electric vehicles:

1.5.2.1 Victoria

- In Victoria, hybrid and electric vehicles received a \$100 annual discount on vehicle registration.

1.5.2.2 Australian Capital Territory

- In the Australian Capital Territory, stamp duty on motor vehicle purchases is reduced for lower emission vehicles - for electric vehicles with zero tailpipe emissions, the stamp duty is \$0.

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Electric powered vehicles are entitled to 20% discount on registration. The owner pays 20% less on the cost of the annual registration component, however must pay the full fee for compulsory third party insurance, road rescue fee, road safety contribution.

There are no electric vehicle incentives in New South Wales, Queensland, South Australia, Western Australia, Tasmania or the Northern Territory.

1.6 Africa

1.6.1 Morocco

Electric and hybrid vehicles are exempt from customs duties since 2017.



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