

Annual update on the global transition to electric vehicles: 2021

Prepared by Hongyang Cui and Dale Hall

The International Council on Clean Transportation (ICCT) reviews the annual progress on the global transition to electric vehicles (EVs), and this briefing is a 2021 update.¹ The annual updates focus on market and policy progress made at the national and state levels, while city-level progress is highlighted in another annual ICCT publication—*Global Electric Vehicle Capitals*.² Electric vehicles in this briefing refer to battery electric vehicles (BEVs), plug-in hybrid electric vehicles (PHEVs), and fuel cell electric vehicles (FCEVs), and do not include non-plug-in hybrid electric vehicles. We consider light-duty vehicles (LDVs) and heavy-duty vehicles (HDVs) and do not examine two-wheelers, three-wheelers, or low-speed vehicles.³

ELECTRIC VEHICLE MARKET DEVELOPMENTS

From analysis of the global EV sales data from EV-Volumes,⁴ the following six key trends are evident.

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- 1 The 2020 update can be found at Hongyang Cui, Dale Hall, Jin Li, and Nic Lutsey, “Update on the global transition to electric vehicles through 2020,” (Washington, DC: ICCT, 2021), <https://theicct.org/publication/update-on-the-global-transition-to-electric-vehicles-through-2020/>.
 - 2 Marie Rajon Bernard, Dale Hall, Hongyang Cui, and Jin Li, “Electric vehicle capitals: Accelerating electric mobility in a year of disruption,” (Washington, DC: ICCT, 2021), <https://theicct.org/publication/electric-vehicle-capitals-accelerating-electric-mobility-in-a-year-of-disruption/>.
 - 3 Light-duty vehicles include passenger cars and light-duty trucks. Heavy-duty vehicles include buses and heavy-duty trucks. Light-duty trucks refer to trucks with a gross vehicle weight rating (GVWR) of up to 3,500 kg while heavy-duty trucks refer to trucks with a GVWR of at least 3,500 kg.
 - 4 EV-Volumes (EV Data Center, 2022), <http://www.ev-volumes.com/datacenter/>.

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www.theicct.org
communications@theicct.org
[twitter @theicct](https://twitter.com/theicct)

ACCELERATED GLOBAL TRANSITION TO ELECTRIC VEHICLES

In 2021, the global transition to EVs continued to accelerate. As is shown in Figure 1, global EV sales hit a record-high of 6.9 million in 2021, a 107% increase from 2020. It is the first time since 2012 that the global EV sales doubled in one year. Of the vehicles sold, 98% were LDVs and the other 2% were HDVs. By the end of 2021, cumulative global sales of EVs reached 18.6 million, a 58% increase from end of 2020. Of these vehicles, 95% were LDVs while HDVs accounted for 5%. In 2021, the global average EV share of new vehicle sales achieved an all-time high of 8.3%, compared to 4.2% in 2020. When only considering new LDV sales, the global average electric share reached 8.8%, twice the 2020 level.

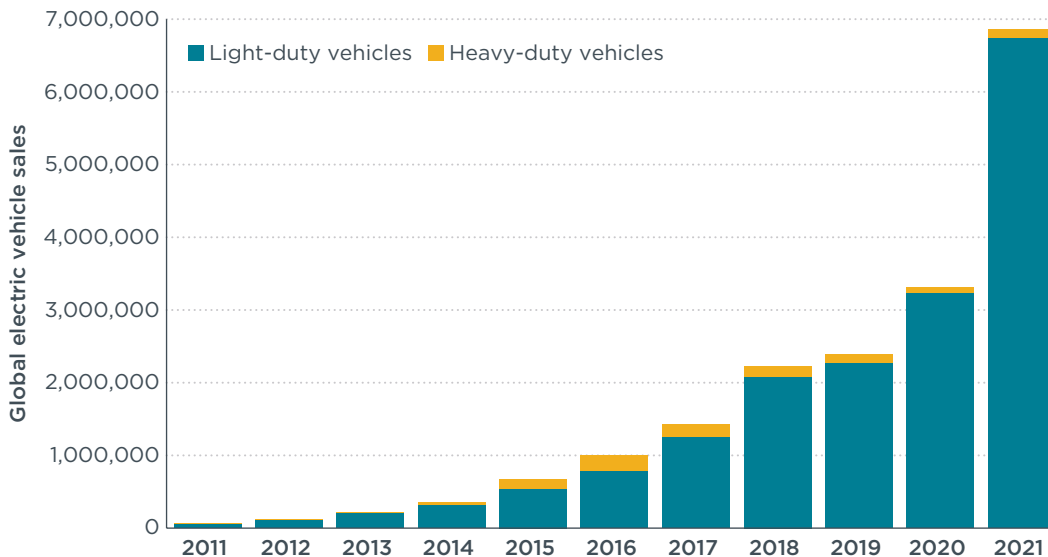


Figure 1. Annual electric vehicle sales globally by vehicle category from 2011 to 2021.

CHINA'S LEADING ROLE IN ELECTRIC VEHICLE DEPLOYMENT

In 2021, China enhanced its leading role in EV deployment. Approximately 3.5 million EVs were sold in China in 2021, 150% higher than the 2020 level. As is shown in Figure 2, this represented 51% of the world's total EV sales in 2021, compared to 42% in 2020. More specifically, 3.4 million electric LDVs and 0.1 million electric HDVs were sold in China in 2021, accounting for 50% and 92% of the world's total, respectively. China is also the market with the most cumulative sales of EVs. By the end of 2021, cumulative sales of EVs in China reached 9.4 million, representing 50% of the global stock. Through 2021, 8.4 million electric LDVs and 1 million electric HDVs have been deployed in China, accounting for 48% and 97% of the cumulative global total, respectively.

Europe as a single market closely followed China as the world's second largest EV market.⁵ In 2021, 2.3 million EVs were sold in Europe, a 66% increase from 2020. This accounted for 34% of the global total, compared to 42% in 2020. Seven of the top ten national markets in terms of annual EV sales in 2021 were in Europe, including Germany, the United Kingdom, France, Norway, Italy, Sweden, and the Netherlands (Figure 3). The United States and South Korea ranked 3rd and 9th, respectively. The

⁵ Europe here refers to 27 European Union Member States, 4 European Free Trade Association (EFTA) countries including Iceland, Liechtenstein, Norway, and Switzerland, and the United Kingdom.

United States hit a record-high EV sales of 667,731, a 103% increase from 2020. South Korea also recorded all-time high EV sales of 115,137, 128% higher than 2020.

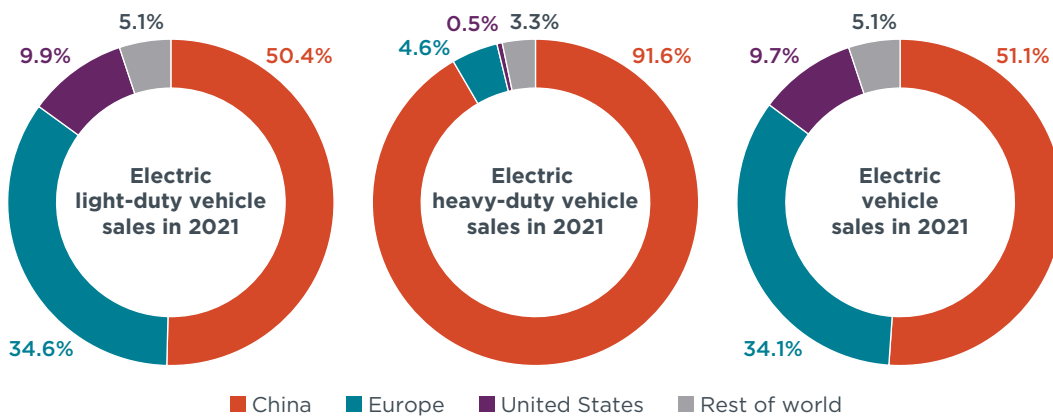


Figure 2. Contributions of China, Europe, and the United States to 2021 global electric vehicle sales.

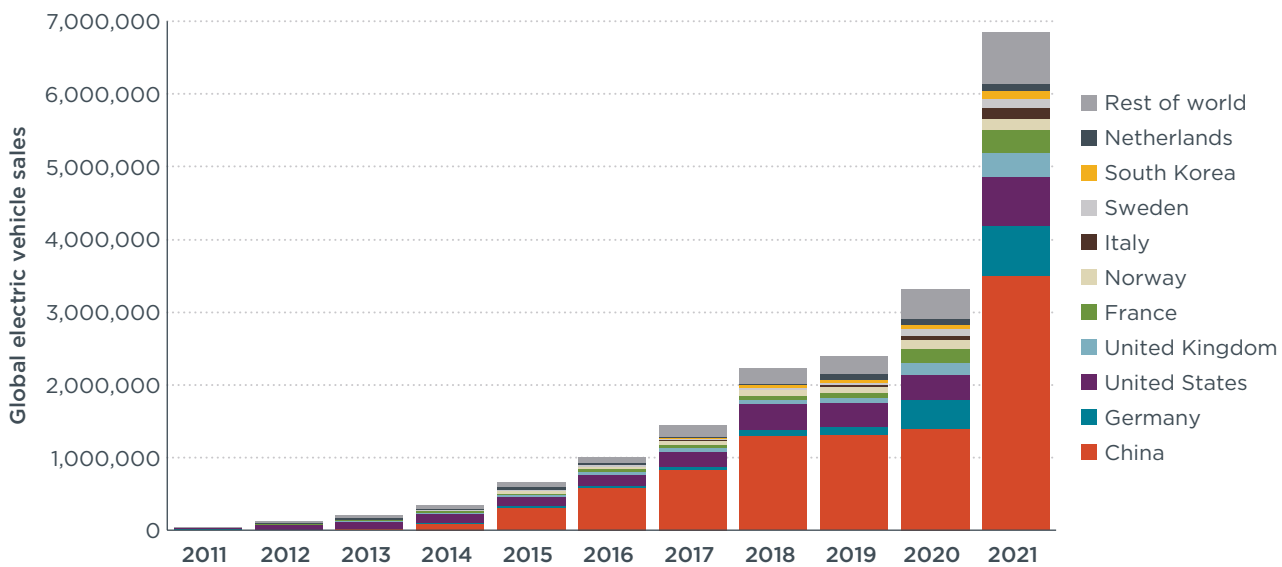


Figure 3. Annual electric vehicle sales globally by market from 2011 to 2021.

EUROPE’S LEADING ROLE IN ELECTRIC VEHICLE PENETRATION

In 2021, Europe maintained its leading role in electric vehicle penetration. With annual sales of 2.3 million electric LDVs, Europe’s electric share of new LDV sales reached 17% in 2021, up from 10.2% in 2020. As is shown in Figure 4, Europe’s EV share was twice the global average and highest among all major vehicle markets in 2021. Furthermore, all 14 countries with the highest EV share of new LDV sales in 2021 are in Europe while China ranked 15th with an EV share of 13.3%. Norway continued to be the country with the highest electric vehicle penetration. In 2021, Norway’s EV share of new LDV sales reached 74.9%, followed by Iceland (66%), Sweden (40.9%), Denmark (30.9%), and Finland (27.4%). In the United States, the EV share of new LDV sales almost doubled in 2021, up from 2.3% in 2020 to 4.4% in 2021.

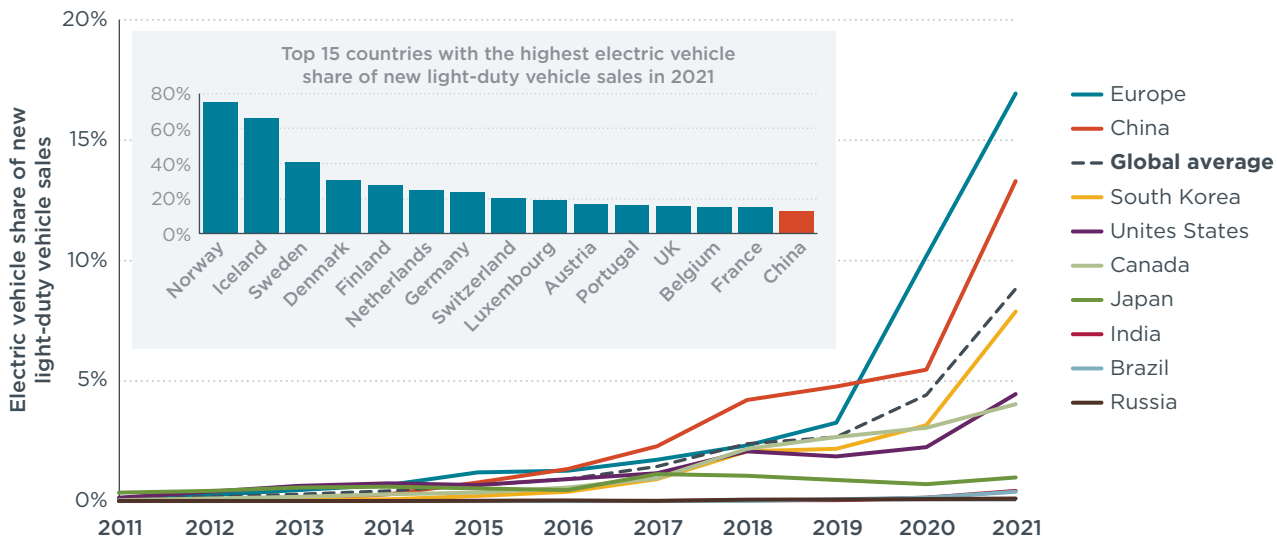


Figure 4. Electric vehicle shares of new light-duty vehicle sales for the largest vehicle markets from 2011 to 2021.

BEVS REPRESENT THE PRIMARY TECHNOLOGY PATHWAY

In 2021, BEVs continued to represent the majority of global EV sales. Global electric LDV sales in 2021 were 71% BEV, 29% PHEV, and 0.2% FCEV, almost the same as in 2020. Figure 5 shows the BEV and PHEV shares of new electric LDV sales for the 15 countries with the largest electric LDV sales in 2021. North American countries had a BEV-to-EV ratio similar to the global average, including the United States (73%) and Canada (73%). Eastern Asian countries featured with an even higher BEV-to-EV ratio, including China (82%) and South Korea (83%). By contrast, BEV and PHEV sales were more balanced in Europe, where PHEVs accounted for 45.2% of electric LDV sales in 2021. All European countries on the top 15 list, except Norway, had a PHEV-to-EV ratio higher than the global average. PHEV-to-EV ratios were even higher than 50% and even became the predominant EV technology pathway in Italy (50%), Sweden (56%), Denmark (61%), Spain (62%), and Belgium (68%). The latest data analysis on the real-world performance of PHEVs indicates that tailpipe emissions are two to four times higher than expected from type-approval values.⁶ The global electric HDV sales in 2021 were 96% BEV, 2% PHEV, and 2% FCEV, reflecting BEV’s role as the most commercially mature technology pathway in today’s electric HDV market.

⁶ Patrick Plötz, Cornelius Moll, Yaoming Li, Georg Bieker, and Peter Mock, “Real-world usage of plug-in hybrid electric vehicles: Fuel consumption, electric driving, and CO2 emissions,” (Washington, DC: ICCT, 2020), <https://theicct.org/publications/phev-real-world-usage-sept2020>.

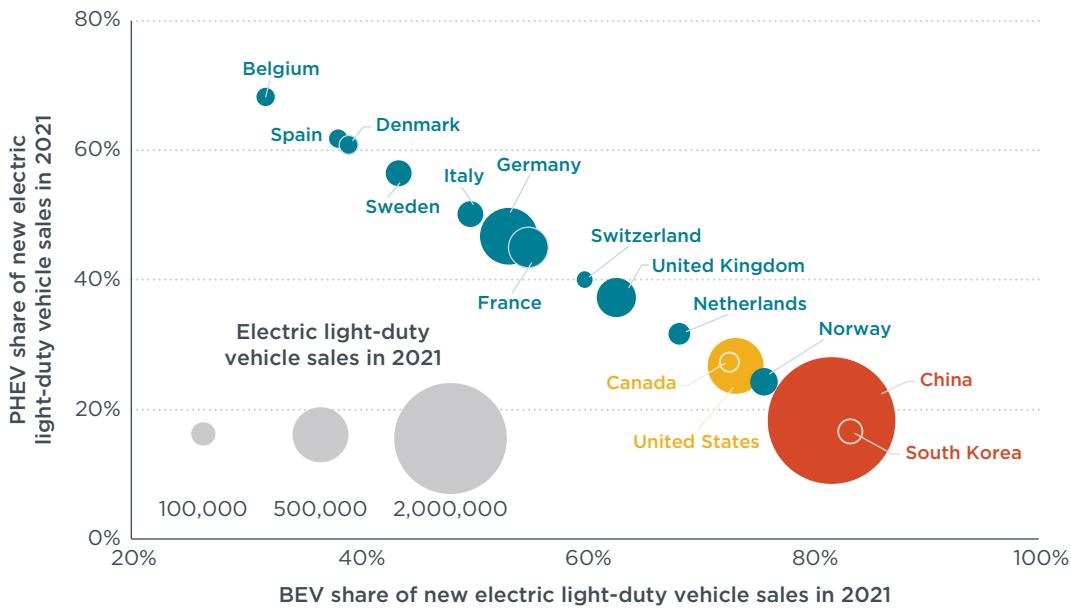


Figure 5. BEV and PHEV shares of new electric light-duty vehicle sales for top 15 countries with the largest electric light-duty vehicle sales in 2021.

EARLY STAGE OF HEAVY-DUTY VEHICLE ELECTRIFICATION

In 2021, electrification of the heavy-duty sector was still in its early stage at the global scale. As is shown in Figure 6, global electric HDV sales decreased for four consecutive years after peaking in 2016. Though a 48% sales increase was achieved between 2020 and 2021, global electric HDV sales in 2021 were still 43% lower than their peak level in 2016. Over 90% of electric HDVs worldwide were sold in China, and no other countries have reached annual electric HDV sales of over 2,000. Germany and India were the only two countries surpassing the 1,000 mark, with electric HDV sales of 1,600 and 1,190, respectively, in 2021. The EV share of new global HDV sales reached a peak level of 2.7% in 2016 and have fluctuated between 1.5% and 2% in the following five years. In 2021, 1.9% of new HDV global sales were EVs.

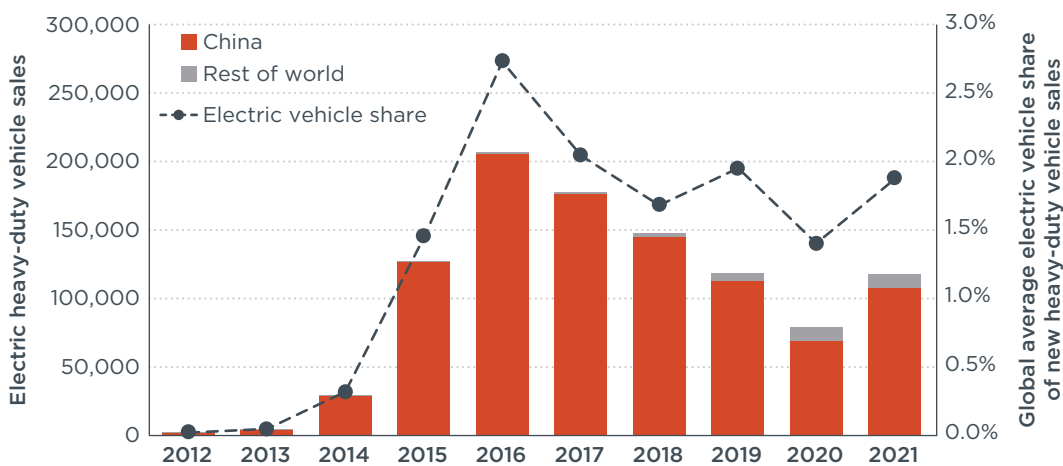


Figure 6. Annual electric heavy-duty vehicle sales globally and the global average electric shares of new heavy-duty vehicle sales from 2012 to 2021.

UNEVEN PROGRESS TOWARD ANNOUNCED VEHICLE ELECTRIFICATION TARGETS

Though many governments around the world have officially announced vehicle electrification targets,⁷ the progress made by 2021 towards these targets was uneven. Figure 7 compares the targeted EV or zero-emission vehicle (ZEV)⁸ share of new sales in select markets with their progress made by 2021; the targets apply to passenger cars, LDVs, or all road vehicles, depending on the country. China's 2021 EV share of new vehicle sales of 13.3% is already close to its 2025 target of 20%, which indicates the feasibility for China to set more ambitious medium- to long-term targets. Norway, with a record-high ZEV share of 56.7%, is in a good position to achieve its 100% zero-emission LDV sales share goal in 2025. Denmark, with an EV share of 20.5%, is in a good position to achieve its 2025 target of 25%. The other markets shown in the figure, however, are still relatively far from achieving their announced goals and will need to make significant progress to meet their targets.

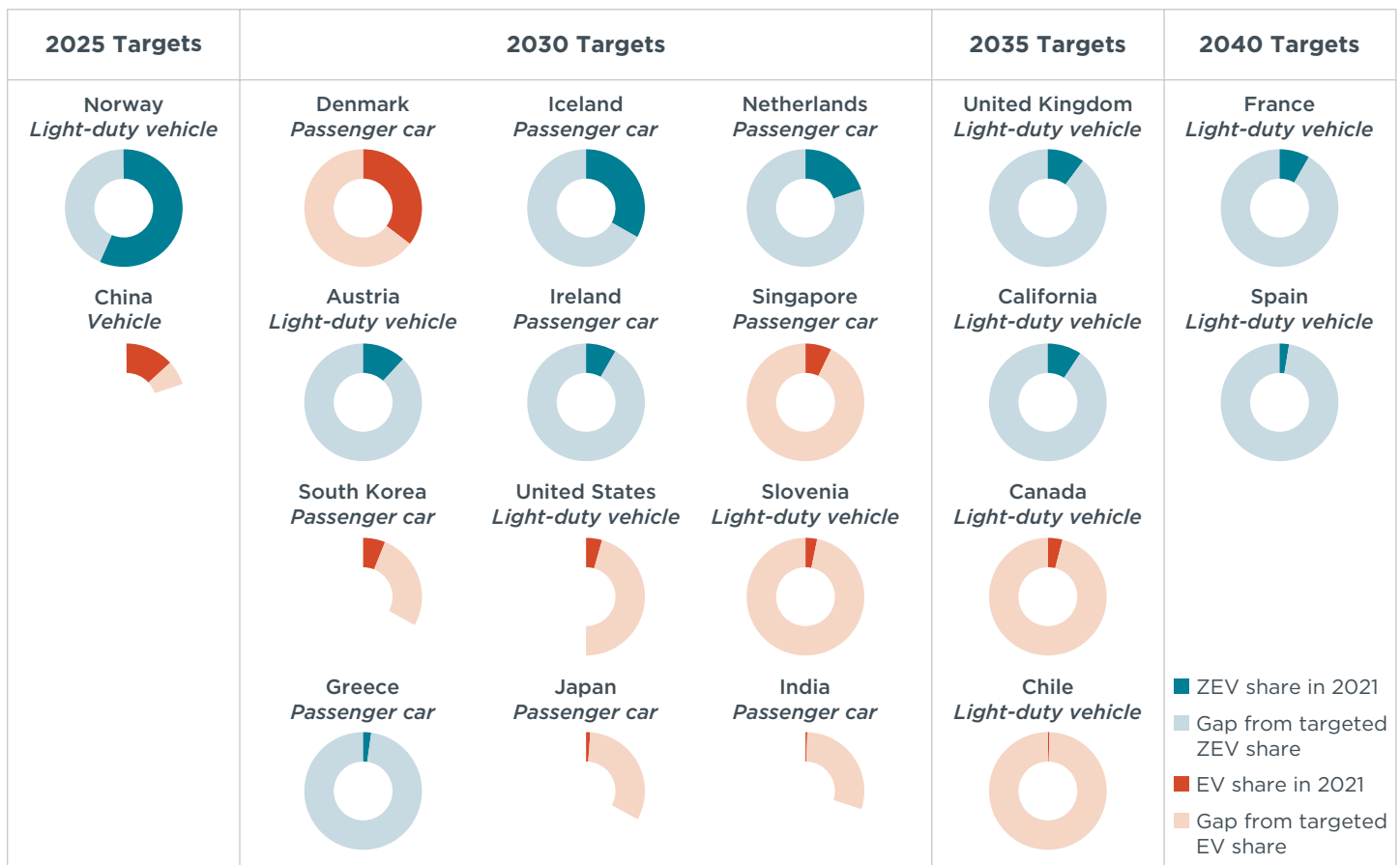


Figure 7. Targeted electric or zero-emission vehicle share of new sales for selected markets and progress made by 2021.

7 International Council on Clean Transportation, Internal combustion engine phase-outs, (accessed May 5, 2022), <https://theicct.org/ice-phase-outs/>.

8 ZEVs include battery electric vehicles and fuel cell electric vehicles.

ELECTRIC VEHICLE POLICY DEVELOPMENTS

From reviewing key policy developments on vehicle electrification globally in 2021, the following four key trends are evident.

MORE AMBITIOUS VEHICLE ELECTRIFICATION TARGETS

In 2021, many new targets on vehicle electrification were announced by national and state governments around the world. New electrification targets for LDVs are summarized in Table 1 and targets for HDVs are summarized in Table 2, both in chronological order.

Table 1. New targets for electrification of light-duty vehicles announced by select national and state-level governments in 2021.

Government	Target year	Target
Finland ^a	2030	700,000 electric cars and 45,000 electric vans on the roads
Indonesia ^b	2030	2 million electric cars on the roads
Singapore ^c	2030	All new cars registered be clean energy vehicles
Thailand ^d	2035	All new cars sold be ZEVs
Canada ^e	2035	All new LDVs sold be ZEVs
Austria ^f	2030	All new LDVs registered be ZEVs
United States ^g	2030	50% of new cars sold be EVs
Chile ^h	2035	All new LDVs be ZEVs
China ⁱ	2025	30% of taxi and ride-hailing vehicle stock be EVs
		20% of logistics vehicle stock be EVs
COP 26 Declaration signatories ^j	2040	All new LDVs sold be ZEVs

^a Finland Ministry of Transport and Communications, "Fossilittoma N Liikenteen Tiekartta [Fossil-free Transport Roadmap]," (2021), https://api.hankeikkuna.fi/asiakirjat/d99a3ae3-b7f9-49df-afd2-c8f2efd3dcd1/e4e97efb-1f23-4c22-bdf1-f1fc27809030/LAUSUNTOPYNTO_20210115060016.PDF.

^b Indonesia Ministry of Energy and Mineral Resources, "Indonesian Govt Supports EV Charging Application," (February 1, 2021), <https://www.esdm.go.id/en/media-center/news-archives/indonesian-govt-supports-ev-charging-application>.

^c Government of Singapore, "Singapore Green Plan 2030," (2021), <https://www.greenplan.gov.sg/>. Clean-energy vehicles, as stated by Singapore's minister for transport, include BEVs, FCEVs, and hybrid vehicles; however, the plan does not specify whether non-plug-in hybrid electric vehicles are also defined as hybrid vehicles.

^d Randy Thanthong-Knight, "Thailand lays out bold EV plan, wants all electric cars by 2035," *Bloomberg*, (April 22, 2021), <https://www.bloomberg.com/news/articles/2021-04-22/thailand-lays-out-bold-ev-plan-wants-all-electric-cars-by-2035>.

^e Government of Canada, "Building a green economy: Government of Canada to require 100% of car and passenger truck sales be zero-emission by 2035 in Canada," (2021), <https://www.canada.ca/en/transport-canada/news/2021/06/building-a-green-economy-government-of-canada-to-require-100-of-car-and-passenger-truck-sales-be-zero-emission-by-2035-in-canada.html>.

^f Austrian Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology, "Austria's 2030 Mobility Master Plan," (2021), <https://www.bmk.gv.at/en/topics/mobility/mobilitymasterplan2030.html>.

^g The White House, "Fact Sheet: President Biden announces steps to drive American leadership forward on clean cars and trucks," (August 5, 2021), <https://www.whitehouse.gov/briefing-room/statements-releases/2021/08/05/fact-sheet-president-biden-announces-steps-to-drive-american-leadership-forward-on-clean-cars-and-trucks/>.

^h Chile Ministry of Energy, "Estrategia Nacional de Electro-Movilidad [National Electric Mobility Strategy]," (2021), https://energia.gob.cl/sites/default/files/estrategia-nacional-electromovilidad_ministerio-de-energia.pdf.

ⁱ China Ministry of Transportation, "绿色交通“十四五”发展规划[Green Transportation Development Plan for the 14th Five-Year-Plan period]," (2021), http://www.gov.cn/zhengce/zhengceku/2022-01/21/content_5669662.htm.

^j "COP26 declaration on accelerating the transition to 100% zero emission cars and vans," (Updated on December 6, 2021), <https://www.gov.uk/government/publications/cop26-declaration-zero-emission-cars-and-vans/cop26-declaration-on-accelerating-the-transition-to-100-zero-emission-cars-and-vans#signatories>. The nations include Austria, Azerbaijan, Belgium, Canada, Cape Verde, Chile, Croatia, Cyprus, Denmark, El Salvador, Finland, Iceland, Ireland, Israel, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, New Zealand, Norway, Poland, Slovenia, Sweden, the Holy See, United Kingdom, and Uruguay.

Table 2. New targets for electrification of heavy-duty vehicles announced by select national and state-level governments in 2021.

Government	Target year	Target
New Zealand ^a	2025	All new public transport buses purchased be ZEVs
Finland ^b	2030	4,600 electric HDVs on the road
Austria ^c	2030	All new heavy-duty trucks under 18 tonnes registered be ZEVs
	2032	All new buses registered be ZEVs
	2035	All new heavy-duty trucks registered be ZEVs
Chile ^d	2035	All new urban buses purchased be ZEVs
		All new medium-duty vehicles sold be ZEVs
	2045	All new intercity buses and trucks sold be ZEVs
China ^e	2025	72% of bus stock be EVs
Global MOU signatories ^f	2030	30% of new medium- and heavy-duty vehicles sold be ZEVs
	2040	All new medium- and heavy-duty vehicles sold be ZEVs
United Kingdom ^g	2035	All new heavy-duty trucks under 26 tonnes sold be ZEVs
	2040	All new heavy-duty trucks sold be ZEVs

^a New Zealand Ministry of Transport, “Public Transport Decarbonization,” (2021), <https://www.transport.govt.nz/area-of-interest/environment-and-climate-change/public-transport-decarbonisation/>.

^b Finland Ministry of Transport and Communications, “Fossilittoma N Liikenteen Tiekartta [Fossil-free Transport Roadmap],” (2021), https://api.hankeikkuna.fi/asiakirjat/d99a3ae3-b7f9-49df-afd2-c8f2efd3dc1d/e4e97efb-1f23-4c22-bdf1-f1fc27809030/LAUSUNTOPYYNTO_20210115060016.PDF.

^c Austrian Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology, “Austria’s 2030 Mobility Master Plan,” (2021), <https://www.bmk.gv.at/en/topics/mobility/mobilitymasterplan2030.html>.

^d Chile Ministry of Energy, “Estrategia Nacional de Electro-Movilidad [National Electric Mobility Strategy],” (2021), https://energia.gob.cl/sites/default/files/estrategia-nacional-electromovilidad_ministerio-de-energia.pdf.

^e China Ministry of Transportation, “绿色交通“十四五”发展规划[Green Transportation Development Plan for the 14th Five-Year-Plan period],” (2021), http://www.gov.cn/zhengce/zhengceku/2022-01/21/content_5669662.htm.

^f “Global memorandum of understanding on zero-emission medium- and heavy-duty vehicles,” (2021), <https://globaldrivetozero.org/mou-nations/>. The nations include Austria, Canada, Chile, Denmark, Finland, Luxembourg, Netherlands, New Zealand, Norway, Scotland, Switzerland, Turkey, United Kingdom, Uruguay, and Wales.

^g Government of the United Kingdom, “UK confirms pledge for zero-emission HGVs by 2040 and unveils new chargepoint design,” (November 11, 2021), <https://www.gov.uk/government/news/uk-confirms-pledge-for-zero-emission-hgvs-by-2040-and-unveils-new-chargepoint-design>.

STRENGTHENED VEHICLE REGULATIONS

In 2021, leading EV markets took actions to tighten their vehicle CO₂ emission standards or strengthen other relevant regulations to further accelerate the deployment of EVs.

- » In July 2021, the European Union released a proposal to revise its CO₂ emission standards for new passenger cars and vans as a part of the “Fit for 55” package.⁹ Based on the proposal, fleet-wide CO₂ emissions for new passenger cars and vans would be cut by 55% and 50%, respectively, in 2030 versus 2021 levels, compared with 37.5% and 31% in the existing standards. From 2035, fleet-wide CO₂ emissions for new LDVs would be 0 g/km, which translates to a 100% zero-emission share of new LDV sales. As of May 2022, the proposal is still under discussion among members of European Union.

⁹ European Commission, “Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) 2019/631 as regards strengthening the CO₂ emission performance standards for new passenger cars and light commercial vehicles in line with the Union’s increased climate ambition,” (July 14, 2021), <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A52021PC0556>.

- » In September 2021, California Air Resources Board (CARB) released a draft of the Advanced Clean Fleets (ACF) regulation, as a part of California's comprehensive strategy to achieve a zero-emission truck and bus fleet by 2045.¹⁰ The draft regulation focuses on drayage trucks, high priority fleets defined as those with over 50 trucks, and federal fleets, as well as state and local government fleets, and proposes zero-emission vehicle purchase percentage requirements. As of May 2022, CARB is still in the process of collecting public comments on the draft regulation via a series of public workshops.
- » In December 2021, the United States revised its greenhouse gas (GHG) emission standards for light-duty vehicles for Model Years 2023–2026.¹¹ Based on the projection of U.S. Environmental Protection Agency (EPA), the revised standards will bring about a fleet-wide CO₂ emission reduction of around 8% per year from 2022 to 2026, compared with around 2% per year under the existing standards. The EPA also estimates that the tightened standards will lead to a 17% electric share of new LDV sales in 2026.

ADJUSTED INCENTIVE PROGRAMS

In 2021, the United Kingdom, Spain, Sweden, Germany, France, and China modified their national EV incentive programs. The adjustments varied by market, with some extending existing programs, some increasing EV incentives, and others continuing to phase down EV incentives.

- » In March 2021, the United Kingdom reduced the maximum purchase subsidy for electric cars from GBP 3,000 to GBP 2,500.¹² In December 2021, the United Kingdom further cut the maximum purchase subsidy by GBP 1,000.¹³
- » In April 2021, Spain announced the third edition of its EV subsidy package, the MOVES III program.¹⁴ Electric passenger cars receive a maximum purchase subsidy of EUR 4,500 (EUR 7,000 with scrapping) from April 2021 to December 2023, compared to EUR 4,000 (EUR 5,500 with scrapping) under the previous program. In addition, electric vans receive a maximum purchase subsidy of EUR 7,000 (EUR 9,000 with scrapping) under MOVES III.
- » In April 2021, Sweden increased the maximum purchase subsidy for zero-emission cars from SEK 60,000 to SEK 70,000 and reduced the maximum purchase subsidy for plug-in hybrid cars from SEK 60,000 to SEK 45,000.¹⁵

10 California Air Resources Board (CARB), "Advanced Clean Fleets Draft Regulation and Comments," (accessed April 19, 2022), <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-fleets/advanced-clean-fleets-draft-regulation-and-comments>.

11 U.S. Environmental Protection Agency (EPA), "Revised 2023 and later model year light-duty vehicle greenhouse gas emission standards," (December 30, 2021), <https://www.govinfo.gov/content/pkg/FR-2021-12-30/pdf/2021-27854.pdf>.

12 Government of the United Kingdom, "Plug-in car, van and truck grant to be targeted at more affordable models to allow more people to make the switch," (March 18, 2021), <https://www.gov.uk/government/news/plug-in-car-van-and-truck-grant-to-be-targeted-at-more-affordable-models-to-allow-more-people-to-make-the-switch>.

13 Government of the United Kingdom, "Government funding targeted at more affordable zero-emission vehicles as market charges ahead in shift towards an electric future," (December 15, 2021), <https://www.gov.uk/government/news/government-funding-targeted-at-more-affordable-zero-emission-vehicles-as-market-charges-ahead-in-shift-towards-an-electric-future>.

14 Institute for the Diversification and Saving of Energy (IDEA), "Programa MOVES III [MOVES III Program]," (accessed in May 5, 2022), <https://www.idae.es/ayudas-y-financiacion/para-movilidad-y-vehiculos/programa-moves-iii>.

15 Sweden Transport Agency, "Bonus - for low emission vehicles," (accessed May 12, 2022), <https://www.transportstyrelsen.se/en/road/Vehicles/bonus-malus/bonus/>.

- » In December 2021, the new government of Germany announced an extension of the EV purchase subsidies adopted in July 2020 as part of the COVID-19 recovery packages to the end of 2022.¹⁶ Consumers can receive a maximum purchase subsidy of EUR 9,000 for BEVs and EUR 6,750 for PHEVs. From 2023, the incentive program will be adjusted to be more oriented towards climate protection.
- » In December 2021, France released a decree to postpone its originally planned reduction of EV purchase subsidies.¹⁷ France reduced the maximum purchase subsidy from EUR 7,000 to EUR 6,000 on July 1, 2021 and planned to implement a further reduction of EUR 1,000 on January 1, 2022. However, based on the decree, the further reduction will not take into effect until July 1, 2022.
- » In December 2021, China released a policy document to adjust its EV purchase subsidies for 2022 and beyond.¹⁸ The 2022 purchase subsidies will be cut by 20% for public fleets and 30% for other vehicles, compared to 2021 levels. Starting from 2023, China will no longer provide purchase subsidies for EVs at the national level.

OPTIMIZED ENERGY REFUELING INFRASTRUCTURE STRATEGIES

In 2021, California, China, the European Union, and the United States optimized their EV energy refueling infrastructure strategies through developing new regulations, laws, and pilot programs.

- » In July 2021, the European Union released a proposal to implement an Alternative Fuels Infrastructure Regulation (AFIR), as a part of the “Fit for 55” package.¹⁹ One major revision is to turn the current directive into a regulation,²⁰ which ensures that all EV charging requirements are legally binding and directly applicable in all EU Member States as soon as it comes into force.²¹ Based on the proposal, each EU Member State would be required to have at least 1 kilowatt (kW) of publicly accessible charging capacity for each battery electric LDV and 0.66 kW for each plug-in hybrid electric LDV registered. The proposal also sets minimum requirements for the rollout of charging stations and hydrogen refueling stations serving HDVs across the Trans-European Network for Transport (TEN-T) and related urban nodes in addition to overnight truck parking areas. By contrast, the current directive set a target of ten electric cars per charge point.
- » In July 2021, California released the *Electric Vehicle Charging Infrastructure Assessment* which set 2030 targets for charging infrastructure to fulfill California’s

¹⁶ Federal Government of Germany, “Regierungspressekonferenz vom 13. Dezember 2021 [Government press conference on December 13, 2021],” (December 13, 2021), <https://www.bundesregierung.de/breg-de/suche/regierungspressekonferenz-vom-13-dezember-2021-1991184>.

¹⁷ French Republic, “Décret n° 2021-1866 du 29 décembre 2021 relatif aux aides à l’acquisition ou à la location de véhicules peu polluants [Decree No. 2021-1866 of December 29, 2021 relating to aid for the acquisition or rental of low-polluting vehicles],” (2021), <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000044613558>.

¹⁸ China Ministry of Finance, “关于2022年新能源汽车推广应用财政补贴政策的通知[Notice on 2022 financial incentive policies for new energy vehicle promotion and application],” (2021), http://www.gov.cn/zhengce/zhengceku/2021-12/31/content_5665857.htm.

¹⁹ European Commission, “Proposal for a regulation of the European Parliament and the Council on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU of the European Parliament and of the Council,” (July 14, 2021), https://ec.europa.eu/info/sites/default/files/revision_of_the_directive_on_deployment_of_the_alternative_fuels_infrastructure_with_annex_0.pdf.

²⁰ European Commission, “Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure,” (October 22, 2014), <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32014L0094>.

²¹ Based on the definition from the European Union, a regulation is a binding legislative act that comes into force on a set date in all member states while a directive sets out targets that all member states must achieve but each member state is free to turn the directive into their own national laws on how to achieve the targets.

100% ZEV goals.²² Based on the assessment, nearly 1.2 million chargers will be needed to support 8 million zero-emission LDVs and 157,000 chargers will be needed to support 1.2 million zero-emission HDVs in 2030. In November 2021, California approved a three-year USD 1.4 billion plan to support EV energy refueling infrastructure buildout.²³

- » In October 2021, China launched a two-year pilot program to promote the application of battery swapping technology, which is considered a complementary EV energy refueling solution to plug-in charging.²⁴ Eleven cities were selected as the first batch of pilot cities: Beijing, Nanjing, Wuhan, Sanya, Chongqing, Changchun, Hefei, Jinan, Yibin, Tangshan, and Baotou. The last three cities will focus only on heavy-duty truck applications while the others will demonstrate battery swapping on various types of vehicles. The Chinese central government aims to put at least 100,000 battery-swapping-capable EVs on the road and build at least 1,000 battery swapping stations through this pilot program.
- » In November 2021, the United States enacted the Infrastructure Investment and Jobs Act (IIJA), which allocates USD 7.5 billion in new federal funding to build a national network of 500,00 EV chargers.²⁵ The funding will cover chargers along highway corridors to facilitate long-distance travel and chargers within communities to provide convenient charging where people commonly park. In December 2021, the Biden administration released an *EV Charging Action Plan*, which outlines steps for federal agencies to take to implement the IIJA.²⁶

CONCLUSION

There was substantial progress made in the global transition to EVs in 2021, despite the ongoing COVID-19 pandemic. Global EV sales hit a record-high of 6.9 million, a 107% increase from 2020. The global EV share of new vehicle sales also recorded an all-time high of 8.3%, compared with 4.2% in 2020. Many important EV policy developments also occurred in 2021, including more ambitious vehicle electrification targets, tightened vehicle regulations, adjusted incentive programs, and optimized energy refueling infrastructure strategies. With governments worldwide actively confronting global climate change, the global transition to EVs is expected to hit new milestones in 2022. The ICCT will continue tracking progress made in this crucial transition to electric.

22 California Energy Commission, “Electric Vehicle Charging Infrastructure Assessment – AB 2127,” (accessed May 5, 2022), <https://www.energy.ca.gov/programs-and-topics/programs/electric-vehicle-charging-infrastructure-assessment-ab-2127>.

23 California Energy Commission, “CES approves \$1.4 billion plan for zero-emission transportation infrastructure and manufacturing,” (November 15, 2021), <https://www.energy.ca.gov/news/2021-11/cec-approves-14-billion-plan-zero-emission-transportation-infrastructure-and>.

24 China Ministry of Industry and Information Technology (MIIT), “工信部启动新能源汽车换电模式应用试点工作[MIIT initiated battery swapping application pilot program for new energy vehicles],” (October 28, 2021), http://www.gov.cn/xinwen/2021-10/28/content_5647458.htm.

25 The White House, “President Biden’s bipartisan infrastructure law,” (accessed in April 19, 2022), <https://www.whitehouse.gov/bipartisan-infrastructure-law/>.

26 The White House, “Fact Sheet: The Biden-Harris Electric Vehicle Charging Action Plan,” (December 3, 2021), <https://www.whitehouse.gov/briefing-room/statements-releases/2021/12/13/fact-sheet-the-biden-harris-electric-vehicle-charging-action-plan/>.