

Zero-Emission Vehicles Progress Dashboard

ZEV Transition Council Meeting

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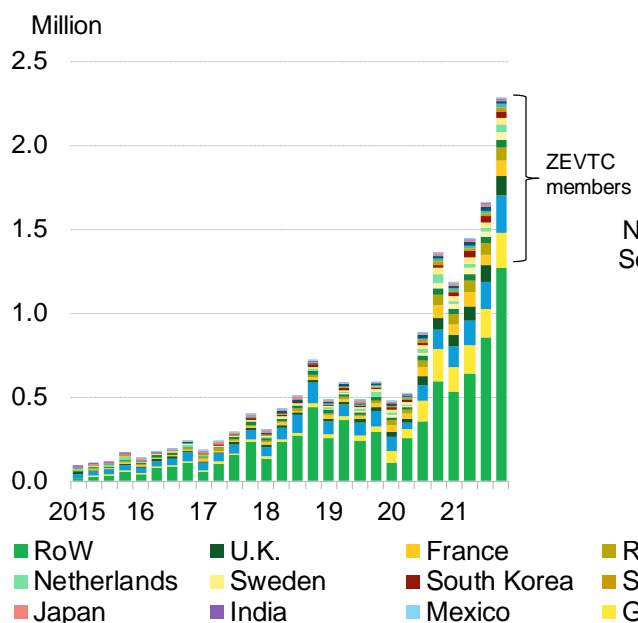


About this dashboard

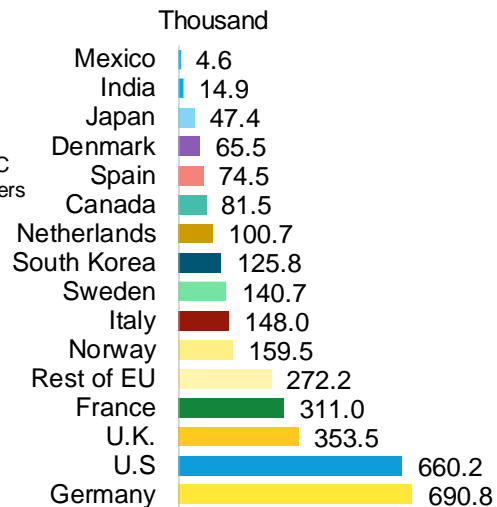
- This dashboard has been produced for the Zero-Emission Vehicles Transition Council (ZEVTC) by BloombergNEF, at the request of the U.K. Department for Business, Energy and Industrial Strategy (BEIS).
- Coverage scope:
 - ZEV adoption, charging infrastructure deployment and automakers' ZEV sales
 - Focused on ZEV Transition Council countries
- Timeframe:
 - Data from 2015 to end-2021
 - Future editions of this dashboard will use latest available data, on a quarterly basis where available
- Sources: BNEF research, and other data sources noted on each slide

Global passenger EV sales reached a new record in 2021

Quarterly EV sales, by country



2021 EV sales in ZEV Transition Council countries



Global passenger EV sales grew by 103% in 2021, to nearly 6.6 million units.

China and Europe have led the global passenger EV and FCV market since 2015, being responsible for 85% of global EV sales in 2021.

The next largest market was the U.S. at 10% of the global total in 2021.

ZEVTC member countries combined were responsible for 50% of global passenger EV sales.

The EU-27 leads the way in this group, with 1.8 million EVs sold in 2021 – 28% of global EV sales – and 55% of total ZEV Council member countries' sales.

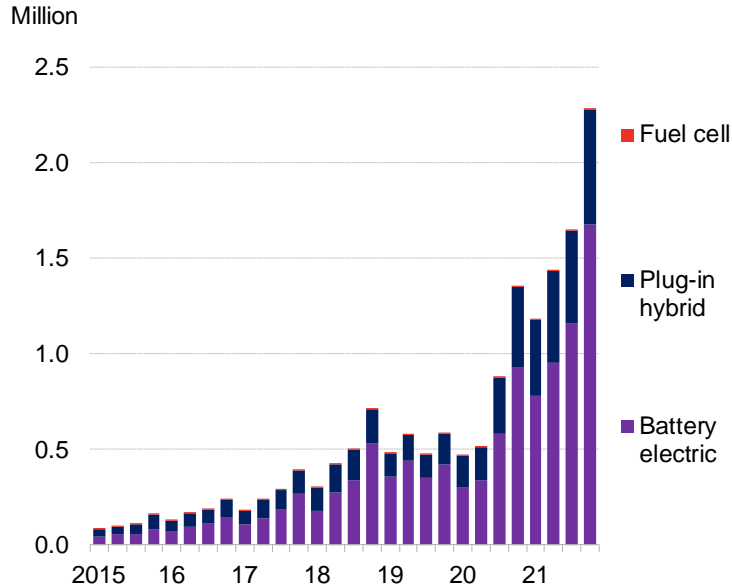
Outside of the EU, the U.S., U.K., Norway and South Korea are leaders in absolute terms with 660,000, 353,000, 159,000 and 126,000 sold in 2021, respectively.

EV sales grew the fastest in India, up 209% in 2021 compared to 2020.

Source: BloombergNEF, Marklines, Jato. Note: Includes BEV, PHEV and FCVs

Pure battery EVs are beating out plug-in hybrids

Global passenger EV sales by drivetrain



Source: BloombergNEF, Marklines, Jato. Note: Includes BEV, PHEV and FCVs

Globally, sales of battery electric vehicles outweigh those of plug-in hybrids and fuel cell vehicles.

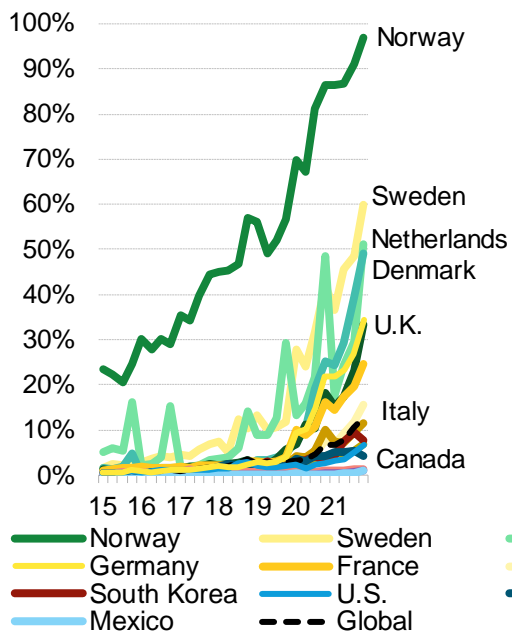
- BEVs were nearly 70% of 2021 global EV sales
- PHEVs were 30%
- FCVs are a miniscule portion of the EV market, below 1% of sales globally

FCVs continue to find it difficult to compete with BEVs on cost and popularity and are unlikely to gain market share in the passenger vehicle segment.

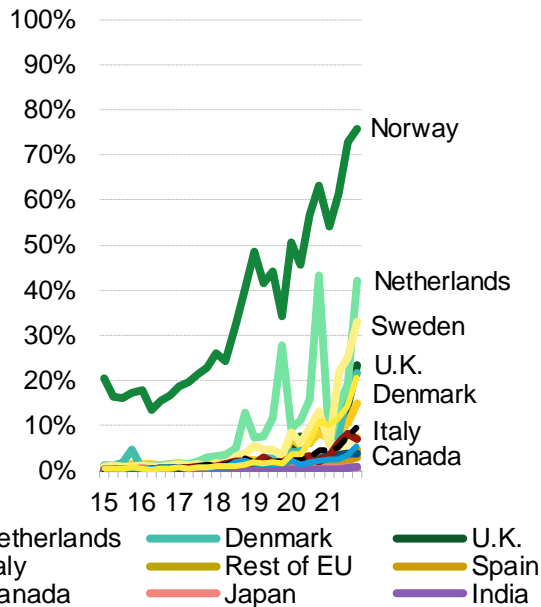
Of the ZEVTC countries, only Japan and South Korea have meaningful activity on fuel cell vehicles. Their sales were limited in 2021, accounting for 5% and 8% of EV sales in the two countries, respectively.

Some regions have reached mass-market adoption

EV share of passenger vehicle sales



ZEV share of passenger vehicle sales (excludes PHEVs)



Globally, EVs accounted for 13% of passenger vehicle sales in 4Q 2021, or 9% when excluding PHEVs.

Some ZEVTC members are well above this global average, while others are still getting their ZEV markets started.

If plug-in hybrids (PHEVs) are included, countries such as Norway (97%), Sweden (60%), Netherlands (51%) and Denmark (49%) have reached very high sales penetrations.

Just under half of all EVs sold in the EU-27 in 2021 were PHEVs – more than in other regions – but these are not true zero-emission vehicles.

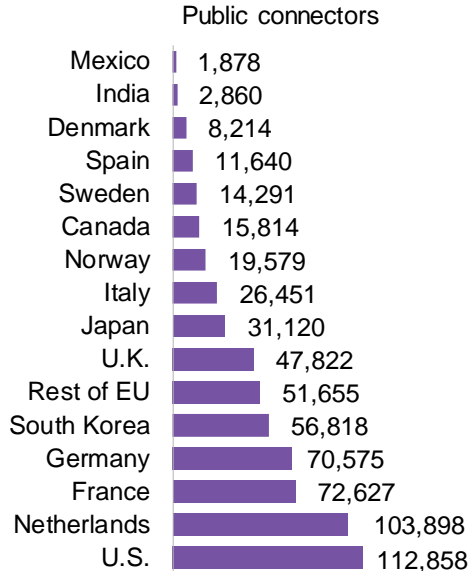
This means that the actual ZEV share of passenger vehicles sales in ZEVTC countries like Sweden, Netherlands and Denmark was at 33%, 42% and 22% in 4Q 2021, respectively.

Some 75% of passenger EV sales in Mexico were also PHEVs in 2021.

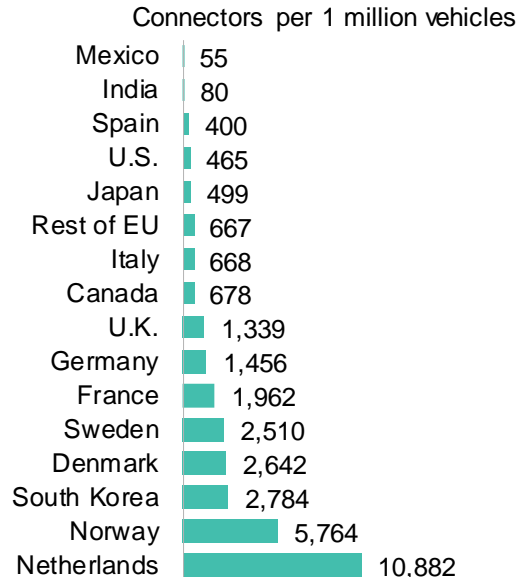
Source: BloombergNEF. Note: Includes BEV, PHEV and FCVs

The public charging infrastructure base is growing steadily

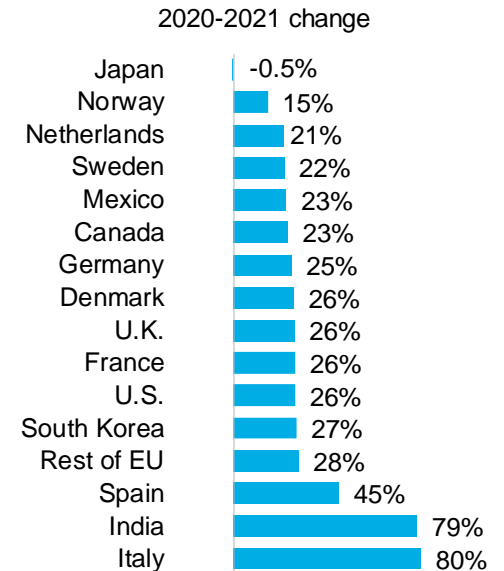
Cumulative public charging connectors installed, 2021



Public charging connectors normalized by vehicle fleet, 2021



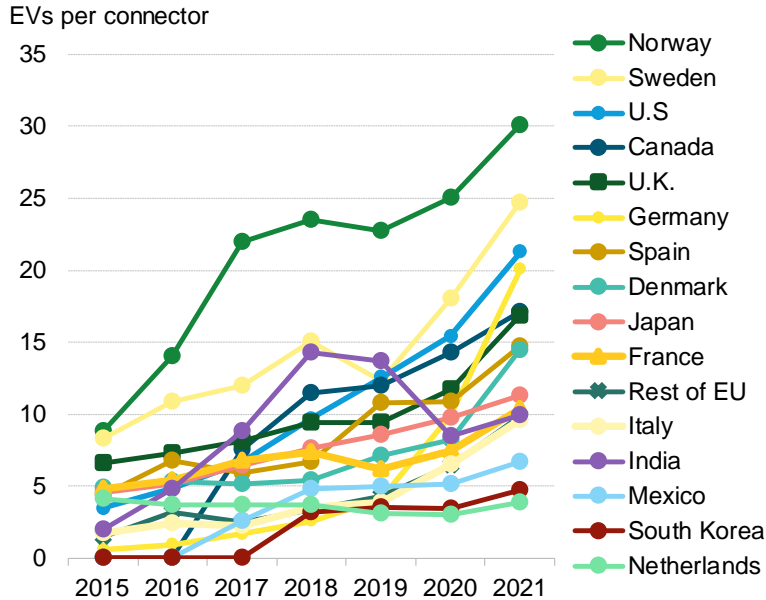
% net change 2020-2021



Source: BloombergNEF. Note: middle chart is normalized by total passenger vehicle fleet size (all drivetrains).

The number of EVs per public connector has increased in all countries

EVs per public charging connector



Source: BloombergNEF

In 2021, the global ratio of EVs on the road to public charging connectors was 9.2, growing from 7.4 in 2020

For ZEVTC countries, the ratio of EVs on the road to public charging connectors was 14.1 in 2021, up from 10.2 in 2020.

The ratio has increased for all ZEV Transition Council countries, but to a different extent.

Netherlands, Canada and Japan saw limited change, signalling that growth in charging is matching growth in EV sales.

Others, such as Denmark, Italy and the U.K. saw a fast growth in the ratio signalling that installations did not grow as fast as vehicle sales.

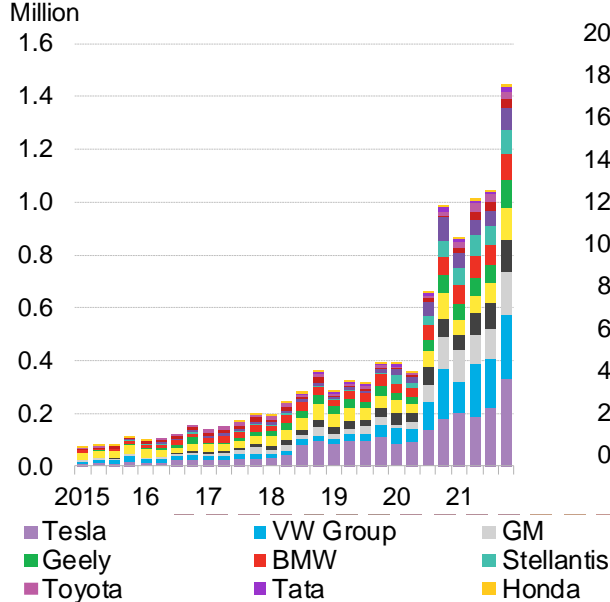
Differences depend on access to home charging, drivetrain mix and utilization of existing infrastructure.

Norway has the highest ratio of EVs to public chargers, at 30:1. This can be explained by the high prevalence of detached houses in the country, and therefore home charging availability. Increasing utilization of existing infrastructure also plays a role.

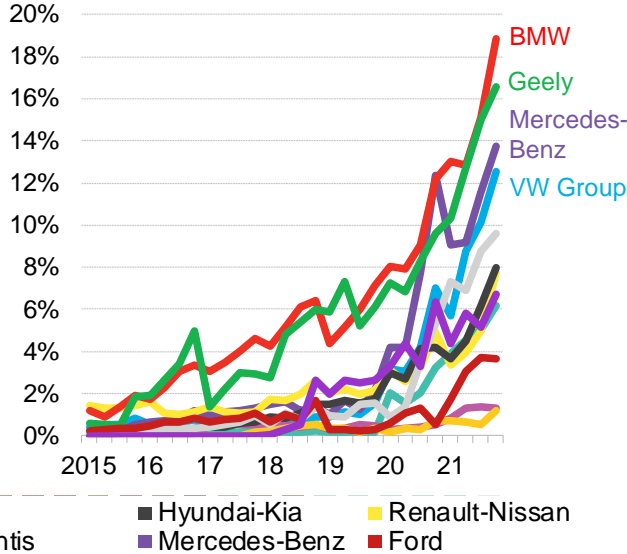
In Denmark, the ratio increased by 77% in 2021, as EV sales grew 105%. Note that 62% of EVs sold in the country in 2021 were PHEVs, which are less likely to rely on public charging.

Several automakers have surpassed 10% EV share of sales

Passenger EV sales by automakers associated with ZEVTC countries



Passenger EV share of sales by automaker



Leading automakers that are associated with ZEVTC countries represented nearly 4.4 million in total EV sales in 2021 – two-thirds of the global total.

Tesla, VW Group, GM, Hyundai-Kia led the pack. These accounted for nearly two-thirds of the total covered in this slide.

EV sales from this group of 13 automakers were up 45% from 2020.

Tesla has been the leading EV manufacturer since 2018, and sold over 930,000 BEVs globally in 2021. Volkswagen Group is gradually catching up.




BMW, Geely and Mercedes-Benz had the highest EV share of sales, excluding Tesla.

BMW's EV sales share was 19%, Geely's was 17% and Mercedes-Benz hit 14%.

Source: BloombergNEF. Note: Includes automakers that are headquartered or have major operations in ZEVTC countries. Renault Nissan includes Mitsubishi. Geely includes Volvo. Commercial vehicles are included in manufacturers total sales. EV sales from Chinese JVs are attributed to both partners in full.

Early signs of decarbonization progress for trucks

Selected companies' targets for zero-emission trucks

Company	ZEV R&D investment	ZEV sales targets		
		2025	2030	2040
	"Vast majority of total" by 2025	n/a	Up to 60%	100% (by 2039)
	n/a	n/a	>35%	"Absolute majority"
	2.6 bn euros, 2021-26	10% Scania in Europe	50% (Scania) 40-60% (MAN*) 50% all group long-haul trucks	

Source: BloombergNEF, company press releases Note: ZEV is zero emission vehicle; Daimler Truck's R&D was EUR1.4 billion in 2021; *MAN targets are separate for long-haul (40%) and delivery (60%) trucks. Traton targets 50% of its long-haul trucks to be battery electric by 2030. Other truckmakers do not breakdown technology shares, but for 2030 their targets are likely to be met using battery electric trucks.

Sales of zero-emission trucks are still very low, putting commercial vehicle decarbonization far behind the progress made in passenger vehicles.

Three major truck manufacturers have recently presented plans for zero emission medium- and heavy-duty trucks.

Between 2019-2021, these three manufacturers (Daimler, Volvo and Traton) sold around 450,000 units annually in ZEVTC countries, accounting for about 30% of the market.

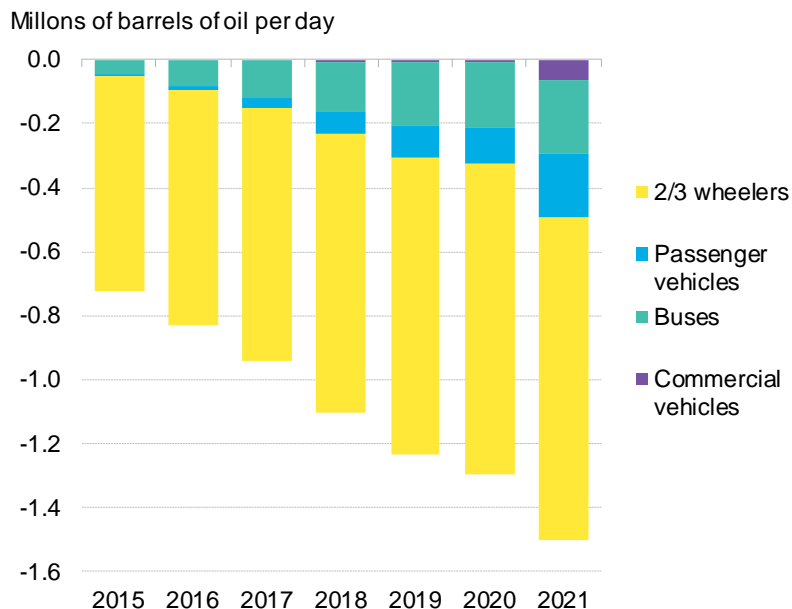
Many manufacturers expect to deploy both battery electric and fuel cell trucks to reach decarbonization targets.

All-electric medium- and heavy-duty trucks are already being used in several applications. Some fuel cell trucks are also being trialed, but their deployment timelines generally point towards the end of the 2020s.

For either technology, refueling infrastructure is a necessary condition before large-scale adoption.

Oil use avoided by EVs has more than doubled since 2015

Oil demand avoided by EVs and FCVs



Source: BloombergNEF, IEA

Global oil demand in road transport reached roughly 43.7 million barrels per day in 2021, a slight increase since 2015.

The adoption of electric vehicles and fuel cell vehicles avoided almost 1.5 millions of barrels of oil per day in 2021 – about 3.3% of total demand. The displaced demand is roughly equivalent to one-fifth of Russia's total oil and oil products exports prior to the war, and roughly double Germany's imports of Russian oil and products at the end of 2021.

Avoided oil consumption has more than doubled in the past six years, up from ~725,000 barrels of oil per day in 2015.

Two- and three-wheeled EVs accounted for 67% of the oil demand avoided in 2021. This is due to their rapid adoption particularly in Asia.

Buses, with 16% of total oil demand avoided, were next, followed by passenger vehicles, the fastest growing segment, accounting for 13%. Commercial vehicles accounted for just 4% of total oil demand avoided in 2021, largely from light commercial EVs.

In BNEF's Net-Zero Scenario, which achieves a zero-emission vehicle fleet globally by 2050, oil displacement increases to over 7 million barrels per day in 2030 – roughly equivalent to Russia's total oil and products exports prior to the war.

This figure rises to nearly 16 million barrels per day in 2035, and represents permanent removal of oil dependency.

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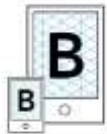
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