

**Electric road vehicles - Summary
ownership, regional analysis and Report 2022:12
a possible development by 2030**

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Transport Analysis

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Summary

The number of newly registered rechargeable¹ road vehicles² has increased rapidly in recent years, but the transition to an electrically powered vehicle fleet takes time. As of year-end 2021 there were roughly 322,000 rechargeable road vehicles on the road, nearly 300,000 of which were passenger cars. The growth of electrically powered road vehicles up to 2021 involved mainly light vehicles in the form of passenger cars and electric scooters, although electrically powered buses and light lorries have also accounted for an ever-greater share of new sales since 2019. Electrically powered heavy lorries have more development ahead of them, but here again some such vehicles have begun to be registered, although they are few in number. There are still only a small number of vehicles that can be fuelled with hydrogen. At the end of 2021 there were 42 hydrogen-fuelled passenger cars and two such heavy lorries on the road.

The majority of the rechargeable vehicles are found in our large urban areas, in southern Sweden and along the Norrland coast. This is true in the case of passenger cars regardless of whether we consider the number of vehicles on the road or in relation to the population size of the municipality in question. As is the case with rechargeable passenger cars, the bulk of the rechargeable light lorries are found in or around major cities. Rechargeable light lorries as a share of the total number of light lorries are also most common in southern Sweden and along the Norrland coast, often in densely populated municipalities. A large proportion of these lorries are associated with commercial activities in many different industries, such as the construction and civil engineering industry, property management, and trade. In relation to the number of job sites, a large proportion of the rechargeable lorries are found in southern Sweden, in certain municipalities surrounding Stockholm, Gothenburg and Malmö, and in a stretch from Karlstad and south to Jönköping and then further south along the E4. The East Coast, both north and south of Stockholm, also has a relatively large share of rechargeable light lorries.

The number of electric buses has increased notably since 2019. Although they are still relatively few in number, they are present in both northern and southern Sweden. Rechargeable heavy lorries are found in a few municipalities concentrated around Stockholm and Gothenburg.

Investigating where in Sweden four-year-old rechargeable passenger cars are found on the road as opposed to where they were newly registered can provide us with some idea of the distribution of our second-hand market. Of the 19,500 rechargeable passenger cars newly registered in 2017, 14,400 were still in the Swedish vehicle fleet in 2021. Between 2017 and 2021, an increase of at least one 2017-model rechargeable passenger car was seen in 209 of Sweden's municipalities. The total increase in these 209 municipalities was just over 2,300 rechargeable passenger cars. The fact that the number of rechargeable 2017-model cars is increasing in a large share of municipalities indicates that the vehicle fleet is spreading out from the major urban areas to the rest of the country.

Leasing is a common form of ownership for a rechargeable passenger car. Of the rechargeable passenger cars registered in 2021, 70 per cent were leased by either a legal entity or physical person. Rechargeable passenger cars leased by corporations, which are often used as company cars, represent the most common form of ownership for rechargeable passenger cars. It has, in a short time, become increasingly common to lease a rechargeable car privately. Of the roughly 62,000 passenger cars leased privately in 2021, more than half were rechargeable, with a preponderance of pure electrically powered vehicles.

Rechargeable vehicles, both those purchased and those leased, are to some extent attracting a new group of individuals who differ from traditional car buyers. In general, there is a greater tendency towards both owning and leasing rechargeable vehicles among a younger population, and among residents of urban areas, although this tendency is not as prevalent in the most densely populated areas. Neither ethnic

¹ Plug-in hybrids and pure electric power

² Passenger cars, light and heavy lorries, buses, motorcycles and scooters

background nor gender distribution appears to affect rechargeable passenger car ownership. When this new customer base is combined with the existing customer group, which has traditionally bought petrol- or diesel-fuelled passenger cars, it is clear that the total customer base for passenger cars has expanded. The robust growth in new car sales of rechargeable vehicles may be accelerated even more as ordinary car buyers also update their vehicle holdings with a rechargeable vehicle.

Electric vehicle technology will improve by 2030, but the foundation is already here

There are already electric passenger cars, buses and heavy and light lorries on the road in Sweden today. Future developments will likely result in many minor improvements to existing technologies, rather than any major innovative leaps. However, many small technical improvements could still have a major impact on the transport market. Once electrically powered vehicles have overall lower costs than fossil fuel-based vehicles they may enjoy a very rapid breakthrough, particularly in the case of vehicles for commercial use. In addition to optimising vehicle components, the R & D is focused on vehicle systems and total solutions. The pace of the continued introduction of electric vehicles will be at least as dependent upon conditions surrounding infrastructure, the energy supply, policy instruments and market solutions as it is upon the technological advances.

One clear developmental trend is that vehicle software is becoming increasingly important, in part to enable the optimised utilisation and recharging of vehicle batteries. Another developmental focus has to do with smarter recharging with higher outputs.

In terms of the costs of ownership, electrically powered passenger cars are already competitive with corresponding petrol- and diesel-fuelled vehicles in many cases. Policy instruments will consequently become increasingly less important for the continued introduction of electrically powered passenger cars, as they are already sought after in the market.

Developments with regard to electric heavy vehicles are also moving forward rapidly in parallel with greater access to cheaper and lighter batteries. However, there is a danger that the pace of battery technology development will slow.

There are electrically powered heavy vehicles customised for many segments of the transport market. However, in the case of some applications for long-haul and heavy bus and lorry traffic, it is doubtful whether battery-based electric vehicles will be able to offer sufficiently high performance to compete with combustion engine vehicles by 2030. Policy instruments and cost trends will be decisive for the introduction of electrically powered heavy vehicles across a broad front. This applies to policy instruments and support targeting the infrastructure as well.

Hydrogen as an energy source will probably not have any major impact by 2030. Its development beyond that point is less certain. Hydrogen may come to play an important role, particularly in connection with the heavy and long-haul shipments that are currently difficult to make using battery-powered electric vehicles.



Transport Analysis is a Swedish agency for transport policy analysis. We analyse and evaluate proposed and implemented measures within the sphere of transport policy. We are also responsible for official statistics in the transport and communication sectors. Transport Analysis was established in 2010 with its head office in Stockholm and a branch office in Östersund.