

Summary

In 2017, seven of Sweden's eight political parties agreed in Parliament to aim at cutting the emissions of carbon dioxide from domestic transport (excluding aviation) by 70 per cent in 2030 compared to the level in 2010. These emissions had by then only declined by 15 per cent since 2010. During 2018 and early 2019, the responsible government agencies concluded in various statements and reports, that the policy instruments and measures in place (including those decided by the EU) could not be expected to reduce the emissions by more than 30-35 per cent by 2030.

Estimates made in this report indicate that additional efforts and the use of some complementary policy instruments could potentially reduce road transport emissions by an additional 10-15 per cent. This would require raising the level of fuel taxation by 2 per cent per year in real terms throughout the remaining part of the period. It must also include government induced measures to ensure a rapid electrification of all kinds of road vehicles in order to make them cover 60 per cent of new car sales in 2030 and respectively 40 and 20 per cent of all new vans and heavy duty trucks. The entire bus fleet would have to be 30 per cent electrified by 2030.

To supply a growing fleet of electric vehicles, the government needs to, in the near future, take legal steps to force all cities and municipalities as well as landlords and different types of businesses to take responsibility for the local charging infrastructure. The state itself would have to finance most of the fast-charging infrastructure needed for overcoming range anxiety and in addition equip some major motorways with overhead lines for transferring power to long-distance trucks and buses. The latter need to be in place by 2025.

To be able to supply a growing fleet with electricity, local and regional grids will have to be strengthened in many places. The

situation is critical in the greater Stockholm region due to a very fast population growth in recent years.

The Swedish parliament would also have to sharpen the taxation of company cars and parking subsidies paid by employers. Sweden has a long tradition of not taxing the full value of such benefits which partly explains the fact that cars in the executive class make up 31 per cent of new sales, while the average share in EU15 is 13 per cent. In addition, the tax deduction for costs associated with using cars for travelling to and from work would have to be scrapped.

Sweden recently introduced a bonus-malus scheme for taxation of cars and vans which promotes electrification. The bonuses, given to all-electric cars and vans, might have to be raised somewhat in the near future to facilitate the shift. However, it should be possible to reduce the subsidies within a few years, as electric vehicles become less expensive due to mass production and batteries becoming cheaper. Electric heavy-duty trucks also need to be subsidized in the near term in order to achieve a rapid introduction. Electric buses already enjoy such incentives.

Among other measures that need to be employed are a more stringent surveillance of speed limits and demands in private and public procurement that hauliers restrict the speed of trucks to 80 km/h. Local government should make efforts to cut vehicle kilometers by demanding concerted distribution of food and other items purchased by schools, day care centers and other institutions under their authority.

Measures, such as those mentioned above, may contribute to a slow-down in the growth of traffic which, however, will continue to be influenced by a growing population and economy. The population of Sweden is forecasted to rise from 10.0 million to 11.1 million between 2010 and 2030.

However, in the first seven years following 2010, the fleet of light vehicles (cars and vans) grew faster than the population, despite the fact that most of the many new inhabitants (arriving mainly from Africa and the Middle East) cannot yet afford a private car. Journeys by public transport have grown somewhat faster than journeys by car. Most of the increase has been in local and regional train services, in which central and regional government have invested heavily. Overall, the cost of public transport has grown at almost twice the speed of the journeys (counted as passenger kilometers).

Relatively new phenomena, such as e-commerce and car sharing, cannot be expected in the few remaining years to 2030 to have any major impact on car use. It is yet unclear whether e-commerce will result in less, or more traffic. Despite a fast growth (over several years), the vehicles used in car sharing schemes make up less than 0.05 per cent of the total national car fleet.

Cycling has expanded in the inner parts of some of Sweden's cities, but declined in other parts of the country. Per capita cycling has shrunk by 10 per cent since the beginning of the century. Even in a case where cycling would double, car travel would only be marginally affected as a large part of the shift could be expected to be from public transport.

The efficiency of freight transport by truck has declined slightly in recent years, but the growth (ton kilometres produced) has also declined. For this reason, the calculations of future emissions in this report are based on assumptions of a somewhat slower rate of growth, compared with the official predictions by the Swedish Transport Administration.

The assumptions made in the report concerning the use of biofuels in road transport have been taken from a report by a number of state agencies, which jointly estimate that no more than 17-18 TWh domestically produced bioenergy can be used in road transport in 2030, in order to make room for the needs expressed by other sectors. Sweden already uses 19 TWh of biofuels in vehicles and mobile machines of which, however, more than 80 per cent is based on imports. Around two thirds of the total volume is HVO and in recent years, close to 50 per cent has been based on palm oil and PFAD.

The European Commission recently concluded that HVO made from palm oil and PFAD causes larger CO₂ emissions per unit of fuel than standard diesel, when the effects from indirect land-use changes are taken into consideration. Therefore, the conclusion in this report is that Sweden should not allow fuel distributors to use HVO based on palm oil and PFAD to fulfilling their biofuel quota obligations. Instead, the obligation should be set at a level which can be reached without major net-imports of biofuels, as Sweden has far better natural preconditions for producing biofuels than most countries (per capita).

The biofuel obligation, which is currently differing between diesel and gasoline and which does not apply to natural gas, would be more efficient economically if the scheme enforced the same obligations on all fossil road fuels. It should also be widened to include high blends of biofuel such as ED95, E85 and HVO100, which are currently excluded and instead subject to tax exemption.

The overall conclusion of the report is that the CO₂ emissions from road transport could be cut by around 45 per cent between 2010 and 2030, if the government implements all the measures mentioned. However, a slow start may reduce the scope considerably, and a potential lack of essential minerals (e.g. cobalt) and/or batteries may also make it difficult reach the target.

The decision by Parliament to set the target for 2030 at minus 70 per cent was based on reports by two government committees, which assumed that more efficient ways of transporting goods and people as well as a large shift from road vehicles to rail, public transport and biking could reduce car traffic by 21 per cent and freight transport by trucks by 13 per cent by 2030. However, the committees failed to explain how this could be achieved and presented only a few proposals for measures to be used.

A reduction by 70 per cent would require doubling the cost of road fuels or implementing a national scheme for emissions trading, covering CO₂ emissions from all domestic sectors and activities that are not subject to the EU ETS. The latter would be the better choice as it would guarantee that the objective is met, and it would likely be achieved in a cost-efficient way. However, households and businesses would be heavily affected in a situation when Sweden takes such a step in isolation.

The conclusion of the report is that a better way of closing the gap between policy and practice would be to set the target at minus 40 or 45 per cent, and strive to make that happen. As there are good reasons to expect a continuing and rapid electrification of all types of road vehicles post 2030, the longer-term difference between achieving a reduction by 45 per cent instead of 70 per cent in 2030 would be small. Even the less ambitious case would result in road transport becoming fossil-free by 2045, because by the mid-2040s domestically produced biofuels would suffice to cover the remaining demand for liquid road fuels.

However, the less ambitious target for 2030 means that emissions from road transport would during the next 20-25 years become approximately 80 million tons larger, compared to a case where Sweden restrains the use of fossil energy by implementing a legally binding cap that is gradually lowered to minus 70 per cent by 2030. Parliament may therefore consider if setting the national road transport target at 45 per cent should be supplemented with a decision to use government money to buy emission permits from the EU ETS to cover the difference. This would cost approximately 2 billion euro, bought at today's price, and the permits could then gradually be scrapped in order to reflect the annual difference between the two scenarios.

In the context of this report, it may be of interest to compare the results with the conclusions made in a similar analysis of how fast Norway can reduce emissions from road transport (Fridstrøm 2019). In the best of cases, some 62 per cent of the Norwegian passenger car fleet could be emission free by 2030, and the total CO₂ emissions from domestic road transport would shrink by 40 per cent compared to the 2005 level. In a more likely scenario, extrapolating current policies and trends, the author estimates that a 46 per cent share of zero emission cars and a 26 per cent CO₂ cut can be expected by 2030. The author says that both scenarios rely on strong and enduring government incentives for vehicle electrification. In the most ambitious case, minus 50 per cent could be achieved in 2030, by increasing the volume of biofuels used in 2018 by 25 per cent.