【欧州】【自動車】

Road/Railway - Environmental friendly vehicle/General trend in the automobile industry: 2020 provisional EEA data shows greatest annual decrease in CO_2 emissions since 2010 - European automobile manufacturers go electric, at least partial

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【概要：Summary】

The European Green Deal with its target to reach carbon neutrality and net-zero CO_2 emissions covering all sectors of the economy, the transport sector is expected to reduce its GHG emissions by 90% by 2050, compared with 1990 levels. In particular the CO_2 emissions from road transport need to be reduced, as road transport contributed 21% of the EU's total CO_2, emissions and about 72% of all CO_2 emissions in the transport sector in 2017. In this context, the increase of the average CO_2 emissions of newly registered passenger cars in the three consecutive years 2017, 2018 and 2019 is concerning. The average CO_2 emissions will still need to further decrease significantly to reach the target of 95g CO_2/km for passenger cars by 2021, but also the 147g CO_2/km target for vans by 2020. While the European Commission is expected to present even stricter standards to further reduce CO_2 emissions from passenger cars and vans by mid-July 2021, the latest provisional data of the European Environment Agency (EEA) on average CO2 emissions of newly registered passenger cars have significantly improved. The main difference in 2020 compared to 2019 was the decrease of new registrations, related to the impact of the COIVD-19 pandemic. The data also shows that the share of electric passenger cars increased significantly in 2020 compared to the years before. This has led to an improvement of the average CO_2 emissions of passenger cars and vans. Furthermore, automobile manufacturers are seriously considering the phasing out of vehicles with internal combustion engines (ICE), at least in Europe, due to the fact that stricter limits of CO_2 emissions for vehicles can be expected to be introduced. However, as the example of Volkswagen shows, it will be essential that the EU further tightens the CO_2 emission limits for vehicles, as this legal framework will decide on further steps in the automobile industry to reduce their vehicles' CO_2 emissions. This future legal framework will also decide on the timelier phasing out of ICE powered vehicles in Europe, compared to other regions in the world.

【記事：Article】

1. Past CO_2 emissions reduction measures in the EU's road transport

Based on the EU's commitments under the 2015 Paris Agreement and under the European Green Deal

of 11 December 2019 (COM/2019/640 final), the EU intends to become climate neutral in 2050. The European Green Deal covers all sectors of the economy, including the transport sector, and it is targeted to reach net-zero CO_2 emissions by 2050. In particular the CO_2 emissions from road transport need to be reduced, as road transport had a 21% share of the EU's total CO_2, emissions in 2017 and about 72% of all CO_2 emissions in the transport sector. Therefore, the Green Deal calls for a 90% reduction in GHG emissions from transport by 2050, compared with 1990 levels. These GHG emissions in the transport sector are considered a potential obstacle for achieving the EU's overall climate targets. Accordingly, the reduction of CO_2 emissions in the transport sector and in particular road transport, became part of the EU's climate policy.

The EU introduced Regulation (EC) No 443/2009 for the passenger cars and the Regulation (EU) No 510/2011 (EU, 2011) for the light commercial vehicles (vans), setting fleet wide CO_2 emission targets for passenger cars from 2015 to 2019 and for vans from 2017 to 2019, respectively. The targets set for passenger cars (2015) and for vans (2017) were already achieved in 2013. However, in the view of reaching the commitments under the 2015 Paris Agreement, Regulation (EU) 2019/631 was introduced to replace Regulation (EU) 443/2009 on CO_2 emissions from passenger cars and Regulation (EU) 510/2011 on light commercial vehicles, as of 1 January 2020. For the period 2020 to 2024, Regulation (EU) 2019/631 confirms the EU fleet-wide CO_2 emission targets set under Regulations (EC) No 443/2009 and (EU) No 510/2011, which are 95g CO_2/km for passenger cars and 147g CO_2/km for vans. For the period from 2025 to 2029, passenger cars and vans will have to reduce their CO_2 emissions by further 15% based on the EU fleet-wide target in 2021. Fleet-wide performance standards mean that the average CO_2 emissions of all cars registered in the EU in a year must not exceed the allowed value. In other words, not every new car has to be in line with the fleet-wide target (BMU n.y.), but the fleet as a whole. From 2030, the EU fleet-wide target for CO_2 emissions of the new passenger cars needs to be reduced by 37,5%, based on the 2021 target. For the new vans, the 2030 EU fleet-wide target is set at 31% below the 2021 target. The annual CO_2 emission targets of each manufacturer will be based on these EU fleet-wide targets.

The GHG emission reduction of at least 55% net reduction in the revised proposal on a European Climate Law (COM (2020)563 final) should make it possible to reach the climate neutrality target in the EU by 2050. Since the Council adopted the European Climate Law on 28 June 2021, it will soon enter into force. The European Climate Law will make it necessary to introduce new emission reduction measures to achieve the 2030 mid-term target of a 55% net reduction of CO_2 emissions on the trajectory to the net-zero CO_2 emission target of 2050, also for the transport sector.

For achieving this intermediate target of at least 55% net reduction in CO_2 emissions by 2030, the Commission is preparing a revision of several laws as part of the "Fit for 55" package, including Regulation (EU) 2019/631, which is expected to be presented by 14 July 2021.

2. The EEA's final data of 2019 on the average CO2 emissions of new passenger cars and vans

The European Environment Agency (EEA) collects annually the data on CO2 emissions and other parameters of newly registered passenger cars and vans, based on the data reported by the EU Member States, the United Kingdom, Iceland (since 1st January 2018) and Norway (since 1st January 2019). In accordance with Regulation (EC) No 443/2009 and (EU) No 510/2011, and Regulation (EU) 2019/631, and based on the reported data, the EEA evaluates information on the average CO_2 emissions of all new vehicles and their progress toward meeting the CO_2 emission reduction targets.

According to EEA (2021a) and its final data for the average CO_2 emissions from newly registered passenger cars and vans in 2019, almost 15.5 million of new passenger cars were registered in the EU, Iceland, Norway and the UK. Out of these, 59% of passenger cars registrations were petrol cars and diesel vehicles constituted 31%. Sales of plug-in hybrid electric vehicles (PHEV) and battery-electric vehicles (BEV) continued to increase. The combined shares of PHEV and BEV registrations were highest in Norway (56%), Iceland (19%), the Netherlands (16%) and Sweden (12%). However, the overall market penetration of electric cars remained low in new passenger cars registrations in 2019. Plug-in hybrid electric vehicles and battery-electric vehicles reached about 3.5% of all new passenger cars registrations in 2019. Non-plug-in hybrid electric vehicles, which are exclusively fuelled by conventional fuels, represented around 4% of new registrations.

According to EEA final data (EEA 2021a), the 2019 total average CO_2 emissions from new passenger cars increased for the third consecutive year, rising to 122.3g CO_2/km. Therefore, after a steady decline of average CO_2 emissions from new cars from 2010 to 2016, by almost 22g CO_2/km, the average CO_2 emissions from new passenger cars increased by 0.4g CO_2/km to 118.5g CO_2/km in 2017, up from 118.1g CO_2/km in 2016 (EEA 2021a). The upward trend continued with an additional increase of 2.3g CO_2 /km in 2018, to an average CO_2 emission for passenger cars of 120.8g CO2/km, and reached eventually 122.3g CO_2/km in 2019 (EEA 2021a). The 2019 result is still below the target of 130g CO_2/km that applied until 2019. However, the average CO_2 emissions increased by 1.5g CO_2/km compared to 2018 and the continued upward trend in three consecutive years is concerning as this trend could impede the possibility to reach the 95g CO_2/km target for passenger cars in the time frame 2021 to 2024.

As reasons that could explain the increase of the average CO_2 emissions of passenger cars in the past years, EEA (2021a) mainly mentions the increase of sales in the sport utility vehicle (SUV) segment, besides the increase of the share of petrol fuelled vehicles, also the average mass of new cars increased by 30kg from 2018 to 2019. More precisely, about 38% of new car registrations were SUVs, which typically are heavier and have more powerful engines, and have average emissions of 134g CO_2/km and around 13g CO_2/km higher levels of CO_2/km than the average emissions of other new petrol cars.

In 2019, almost all passenger car manufacturers met their annual binding targets for newly registered passenger car fleets, either individually or as members of pools or because of derogations. Only four manufacturers, registering less than 13,000 vehicles a year, Automobili Lamborghini SPA, Bentley, Maserati and SsangYong, exceeded their emission targets. Instead, Toyota achieved the best CO_2 performance, with average specific CO_2 emissions of 108 g CO_2/km, followed by Automobile Citroen and Peugeot, with average CO_2 emissions of around 110 g CO_2/km.

Regarding the average CO_2 emissions of newly registered vans in the EU, Iceland, Norway and the UK, the EEA data show in 2019 an average of 158g CO_2/km, which is the same level as in 2018. This value is below the 175g CO_2/km target that applied until 2019. However, the average CO_2 emissions of new light commercial vehicles stagnate with 158.0 g CO_2/km for both consecutive years, 2018 and 2019 after a period of steady decline until 2017 and a slight increase in 2018.

According to final data published by the EEA (2021a), the average CO_2 emissions of new cars and vans registered in the EU, Iceland, Norway, and the UK in 2019 stayed well below the applicable targets of 130g CO_2/km for passenger cars and 175g CO_2/km for vans, which that applied until 2019. However, considering the 2019 results for passenger cars and vans, a further reduction

of the average CO_2 emissions from newly registered passenger cars and vans will require additional measures to achieve the 55% CO_2 emissions reduction until 2030.

3. EEA's 2020 provisional data of average CO_2 emissions of newly registered passenger cars

Under Regulation (EU) No 631/2019 the EU Member States, UK, Iceland and Norway submit to the Commission all the information for each new passenger car registered in their territory, including the manufacturer 's name, specific CO_2 emissions and mass in running order, fuel type, engine capacity and engine power, among others.

According to EEA's provisional data of average CO_2 emissions of new cars registered across EU-27, UK, Iceland and Norway, there were around 11,56 million newly registered passenger cars in in 2020, down from 15.5 million in 2019. There were 3.94 million registrations less (about -25%) compared to 2019. The average CO_2 emissions of newly registered passenger cars dropped to 107.8g CO2/km in 2020, down from 122.3g CO_2/km (2019). This was 14.5g or 11.86% less in 2020 compared to 2019, and the first decrease observed since 2016.

At the same time, the share of electric vehicles in new registrations tripled from about 3.5% in 2019 to about 11% of new registrations in 2020. Therefore, the main reason that could have led to this sharp decrease of CO_2 emissions was the surge in the significant increase in the share of electric vehicle registrations (European Commission 2021). Accordingly, the possibility to reach the target of 95g CO_2/km target in the period 2021 to 2024 for passenger cars has increased. However, a further drop of 12.8g to reach the target of 95g CO_2/km will be necessary.

Instead, the average mass of new passenger cars in EU Member States, UK, Iceland and Norway was 1,463kg in 2020 (EEA 2021b), compared to 1,421kg in 2019 (ICCT 2020).

Regarding the development of newly registered vans in 2020 across the EU-27, UK, Iceland and Norway, there were about 1.4 million vans newly registered in the mentioned countries in 2020, compared to 1.67 million in 2019, which is about 270,000 vans less. The newly registered vans had an average of CO_2 emissions of 155.7g CO_2/km in 2020, which is 2.3g (1.5%) less than in 2019 (158.0g CO_2/km), according to EEA's provisional data (EEA 2021b, EEA 2021c).

The share of electric vans increased from 1.4% in 2019 to about 2.3% in 2020, after it the share of electric vans registrations had already nearly doubled from 2018 (0.8%) to 2019 (1.4%). However, the vast majority (94%) of new vans still runs on diesel. The average CO_2 emissions for vans are lower in 2020 than in 2019, but they are still on average 8.7g or around 6% above the 2020 target of 147g CO_2/km.

4. Automobile manufacturers go electric - partially

Considering the significant decrease of the average CO_2 emissions of new passenger cars registered in 2020 across EU-27, UK, Iceland and Norway, it shows that in the year of the COVID-19 pandemic, there were about 3.94 million registrations less (about -25%), compared to the year before. However, the share of electric vehicles in new registrations tripled from about 3.5% in 2019 to about 11% of new registrations in 2020 (EEA 2021b, EEA 2021c). The average CO_2 emissions of newly registered passenger cars dropped to 107.8g CO2/km in 2020, down from 122.3g CO_2/km (2019). This was the biggest decrease even registered since 2010, and the first decrease observed since 2016.

Therefore, increasing the number of electric passenger cars seems to be the best way forward to reduce CO_2 emissions not only for the newly registered passenger cars but also to achieve the EU's mid- and long-term CO_2 emission reduction targets for road transport.

Accordingly, in an open call, some 26 major companies representing a wide range of industries in Europe, including IKEA Retail, Sky, Uber, Vattenfall and Volvo Cars, have called on the automobile industry to end the sale of petrol and diesel cars by 2035. The companies also called on the EU decision makers to set an end date for selling new combustion engine cars in Europe, no later than 2035. This call comes ahead of the expected publication of the reviewed CO_2 emission standards for passenger cars and vans in mid-July. Setting a fix date for the phasing out of cars with internal combustion engines (ICE) would send a clear investment signal for automobile manufacturers, supply chains and infrastructure providers. It would also enable businesses to decarbonise their vehicle fleets.

Furthermore, already in March 2021, nine European Member States, including the Netherlands, Austria, Belgium, Denmark, Greece, Malta, Ireland, Lithuania and Luxembourg had called to the European Commission in an unofficial letter to set a phase-out date for the sale of new passenger cars and light commercial vehicles powered with combustion engines in the EU. In addition, these nine Member States were also in favour of improving charging infrastructure for zero-emission transport and significantly stricter CO_2 emission standards. However, although they called for a phase-out of internal combustion vehicles, they did not propose any date as deadline. Meanwhile, however, also some automobile manufacturers are considering a phasing-out of ICE, also because of future stricter targets of other emissions like NO_x. Depending on the future emission limits they could lead to a quick end of combustion engines.

The European Commission's new CO_2 standards for automobile manufacturers could include a mandate to sell 60% non-ICE powered passenger cars in the EU by 2030, followed by a 100% cut of ICE powered vehicles by 2035 - meaning it would be practically impossible to sell ICE powered vehicles by then. Accordingly, the automobile manufacturers would have to prepare for this transition and phasing out of ICE powered vehicles. Volkswagen seems to prepare for the introduction of stricter CO_2 emission targets and new regulations in the EU, but at the same time, Volkswagen intends to continue the production and optimisation of ICE for some time. In Europe, Volkswagen plans to increase the share of battery-electric vehicles in total sales to 70% by 2030 and also considers a quicker development towards a complete phasing out of ICE powered cars even earlier in some domestic markets like Norway. However, considering the best way forward for Volkswagen, it will keep producing ICE powered cars for still some time, since other markets outside Europe will be slower in the transition to have only battery-electric vehicles. In Europe, Volkswagen plans to phase out its business with ICE powered vehicles between 2033 and 2035, however, in the USA and China the phase-out will probably take place later. In South America and Africa, the phase out of ICE powered vehicles can be expected to take longer due to the still missing political and infrastructural framework conditions. Accordingly, Volkswagen Board Member for Sales Klaus Zellmer expects the internal combustion engine technology to stay on for a few more years and therefore the investment into the optimisation of these engines, including diesel engines, will continue (Schmidtutz, Prem 2021). However, in parallel to the EU's Green Deal target to achieve carbon neutrality by 2050, also Volkswagen is intending to make its entire fleet carbon neutral by 2050, at the latest.

Volkswagen's sister company Audi intends to launch new all-electric car models only on the market from 2026 onwards. At the same time, the production of ICE will be "gradually phased out" until 2033, according to Audi's CEO Markus Duesmann (Audi Mediacentre 2021). Accordingly, also Audi would keep working to improve its internal combustion engines until the end to

ensure greater efficiency. Audi plans to stop manufacturing diesel and petrol cars by 2033. However, Duesmann also added that strong demand in China could see Audi's local partners continue to manufacture combustion engine cars beyond 2033. Other automobile manufacturers like Ford and Volvo (in 2030) and Opel (in 2028) announced plans to go all-electric in Europe.

In the end, the customers will decide how quick this transition towards all electric car models will really take place and for how long the ICE car production will continue (Schmidtutz, Prem 2021). However, also the EU's further decisions on stricter CO_2 emission limits will set the standards for the automobile manufacturers, at least for their market in Europe.

5. Conclusion

The EEA's new provisional data on the average CO_2 emissions of new passenger cars registered in the EU, Iceland, Norway and the UK in 2020 show a significant decrease of 14.5 g CO_2/km (-11.86%) in the CO_2 emissions in 2020, the most significant decrease since 2010.

Despite the increasing demand for SUVs and the rebound of gasoline engines together with an increase in the vehicles' mass, which led to an increase in CO_2 emissions for three consecutive years from 2017 to 2019, the sharp drop of CO_2 emissions in 2020 is a sign that the automobile manufacturers seem to finally increase their efforts to rise the share of the electric vehicles in their fleets. The tripled share of electric vehicles in new registrations from about 3.5% in 2019 to about 11% of new registrations in 2020 is seen as the main reason for led to the sharp decrease of CO_2 emissions for passenger cars.

This increase of the electric vehicles' number was achieved despite the overall decrease in the number of registrations of new passenger cars in the COIVD-19 pandemic year 2020. Automobile manufacturers are improving their efforts to reduce their vehicles' climate impact ahead of the introduction of tighter standards and the possibility to reach the target of 95g CO_2/km target in the period 2021 to 2024 for passenger cars has increased. However, a further improvement will be needed from 2025 onwards in order to achieve the target to sell zero-emissions cars by 2035. While some automobile manufacturers like Volkswagen, Audi and Volvo have decided to phase out their production of ICE powered vehicles at least for the European market, stricter CO_2 standards are needed to ensure the whole automobile industry phases out fossil-fuel engines by 2035. To achieve this target, the European Commission will need to propose stricter CO_2 emission targets for new passenger cars and vans as part of its "Fit for 55" package of legislation reviews.

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