

Future CO₂ emissions standards for passenger cars

Climate change and road transport

Reducing carbon dioxide (CO₂) emissions is a major part of the international climate policy developed by the 1992 United Nations Framework Convention on Climate Change. In order to limit global warming to +2°C, industrialised countries need to reduce their greenhouse gases by 80% between 1990 and 2050. For its part, the EU has set out concrete targets in its climate and energy package up until 2020: a 20% reduction in CO₂ emissions, a 20% share of renewables and a 20% boost in energy efficiency. These objectives are complemented by the 2030 Framework for Climate and Energy Policies (agreed upon in October 2014), which aims to reduce greenhouse gas emissions by at least 40% below 1990 levels by 2030 and to increase the share of renewables to 30% and energy efficiency by 27% compared to 2005 levels. Finally, the EU has also committed to reducing CO₂ emissions by 80-95% by 2050 to prevent dangerous global warming.

All the transportation activities in the EU combined (aviation and shipping included) account for 31% of the EU's greenhouse gas emissions. Road transport accounts for about 20% of these emissions while passenger cars account for 12%. The 2011 White Paper on Transport came to the conclusion that, in order to be in line with the EU's 2050 objective, a 60% cut in transport emissions will be required by 2050 from 1990 levels. This equates to a reduction of 3% per year from today's levels. In this respect, road transport (together with agriculture and construction, sectors not covered by the Emissions Trading Scheme) is being asked – in the framework of the EU's climate package for 2030 - to reduce its emissions by 30% compared to 2005 levels. In addition, the recent Energy Union Package calls for an energy-efficient and decarbonised transport sector with comprehensive proposals to reduce the EU's dependency on oil imports (Europe spends €300bn a year on oil imports, two thirds of which is for transport) by promoting alternative power sources, more efficient pricing of infrastructure and energy efficiency. However, while overall CO₂ emissions have declined by 19% since 1990, transport emissions have increased by 23%. Therefore, reducing the 'carbon intensity' of road transport will be essential if we want to reduce transport emissions and achieve our climate objectives.

The electrification of road transport has started (also the first hydrogen cars have entered the marketplace) and electric cars offer important advantages over conventional combustion engines, such as lower running costs and improved air quality. On the other hand, they increase the demand for electricity, which is still mainly produced from fossil fuels. Any electrification strategy should thus be combined with an ambitious strategy to increase the share of renewables in our energy mix.

The European Commission has strongly supported the development of alternative propulsion technologies. The shift to cleaner and green cars was part of the EU's economic recovery strategy (the European Green Cars Initiative) and industry has invested considerable levels of resources to develop a mass market for electric cars. Nevertheless, there are still many limitations that stand in the way of speedy market uptake: limited driving range, long recharging times, high cost of and limited reliability of the battery packs, poor performance at low temperatures, lack of charging infrastructure, etc.

Although sales of electric vehicles (BEV's, hydrogen and plug-in hybrids) doubled in 2015 to 186,000, their market share stands at 1.3%, which is a disappointingly low level. Only in Norway has there been a real breakthrough in electric cars. Thanks to comprehensive promotion (no toll fees for electric cars, allowing electric cars to use bus lanes, free parking, free charging and purchase subsidies) sales of electric cars in Norway now have a 12.5% share of the market.

However, major technological progress will be required to halve the price of electric cars and to double the range of their batteries, thus making them a very attractive proposition. Only when the total cost of ownership of electric cars (plug-in hybrids included) is at the same level as conventional powertrains will market uptake start at least in those market segments that are most sensitive to total cost of ownership considerations (public and company fleets, car rental companies, car sharing schemes, taxis, etc.). Otherwise, a mass market for battery-only vehicles will not emerge.

At the same time, major investments will have to be made in modernising and expanding the electricity grids, the roll-out of charging infrastructure and the establishment of a circular economy around automotives (e.g. recycling of the batteries and rare earths).

The electrification of road transport will probably lead to a sea change in the automotive sector as electric vehicles are less complicated to assemble and to maintain. In addition, the gradual replacement of mechanics by electronics and information technologies will profoundly change the design of cars and the added value chain of the whole automotive industry (constructors, suppliers, maintenance, recycling). In the future, cars will behave like 'moving iPads' in that they will be full of software applications connecting them with the outside world. Newcomers from the ICT or battery sector are likely to enter the sector. However, there is now considerable uncertainty about the future uptake of electric cars: forecasts for 2025 range from 5% to 50% of new car sales. Some companies have announced that they are planning towards a market share of 25% in 2025. If the next generation of electrical cars that enter the marketplace in the next couple of years is really able to solve the problem of 'range anxiety' (they promise an autonomy of about 350 km), a tipping point could be reached.

Confronted with a lack of visibility, setting new ambitious targets for CO₂ emissions will be challenging. At the same time, these objectives should support the European industry to allow it to remain at the cutting edge of technological progress.

Key elements of the current CO₂ regulation

In the late 1990s European car manufacturers made voluntary agreements to reduce passenger car CO₂ emissions, but it was mainly after the introduction of mandatory standards that substantial emissions reductions were achieved. In 2009, the EU introduced mandatory CO₂ standards for passenger cars for the first time. The 2009 regulation set a 2015 target of 130g/km for the fleet average of all constructors combined. Depending on the average vehicle weight, individual manufacturers were allowed to have higher emissions. A similar standard for Light Commercial Vehicles (LCVs) was introduced in 2011, setting a target of 175g/km for 2017.

At the end of 2013 the European Parliament and the Council agreed to reduce CO₂ standards further to 95g/km by 2021 (in the meantime an objective of 147g/km of CO₂ for LCVs has also been set).

Key elements of the current Regulation on passenger cars (EU 333/2014) are as follows:

- A target value of 95g/km of CO₂ for 2021 (which corresponds to 3.8 litres of fuel consumption per 100 kilometres). It can be compared to similar standards for the US (from 29.7 miles per gallon (mpg) today to 54.5 mpg in 2025, which corresponds to 93g/km), Japan (105g/km by 2020) and China (117 g/km by 2020);
- Vehicle weight is maintained as an underlying parameter (i.e. the heavier a manufacturer's fleet, the higher the CO₂ emission value allowed). The factor used is 0.0333, which means that, for every 100 kg of additional weight, emissions of 3.33g/km more of CO₂ are allowed;
- A maximum of 7g/km of credits can be applied for the use of 'eco-innovation' (such as solar roofs, exhaust heat recovery or LED lighting) whose benefits are not adequately captured by the test cycle;

- Super-credits for low-emission vehicles: between 2020 and 2022 every car with CO₂ emissions <50 g/km will count more towards meeting the targets: two in 2020, 1.67 in 2021 and 1.33 in 2022;
- A new test cycle that better reflects real driving conditions. This new test cycle will require that deviations between old CO₂ values and 'real world' emissions are addressed (the difference can be as great as 20%);
- The introduction of a fine of €95 for every g/km of excess emissions beyond 2021;
- A review clause that states that, by the end of 2015, new emission standards for the period beyond 2020 should be established. In this respect, the European Parliament voted in April 2014 for an indicative target of 68-78g/km for 2025.

The average CO₂ emission level of new cars dropped from about 172,2g/km in 2006 to 123,4g/km in 2014 (minus 2% per year). This means that the legal target of 130g/km set for 2015 has been met two years early. The required reduction for the current period (2015-2021) is 27% for all manufacturers. Altogether the new standards for 2021 represent a 40% reduction compared to 2007 levels. Absolute transport emissions are now 10% down from their 2007 levels. This comes after decades of increases. This reduction is partly due to the impact of the financial crisis and the sharp increase in petrol prices. But technological progress has also been impressive: downsizing engines (three-cylinder engines), turbocharging, direct fuel injection, advanced transmissions, lightweight materials. There is now a general consensus that the EU CO₂ legislation for passenger cars has largely been successful in reducing emissions, driving low-carbon innovation in a technology-neutral way, while at the same time guaranteeing investment security to manufacturers.

Creating the right climate for the automotive industry

1. **IndustriAll European Trade Union is in favour of setting new and ambitious emissions limits** for cars for the post-2021 period as a major step towards achieving the EU's climate goals. Emission standards are key in reducing CO₂ emissions in the transport sector, as they increase fuel efficiency without dictating a specific technology solution. IndustriAll Europe is also of the opinion that this must be done in such a way as to create positive synergies between environmental objectives and the promotion of investment, thus giving innovation a boost and having a positive impact on employment. Emission standards have triggered technological progress and led to an impressive improvement in the environmental performance of cars. New standards can further trigger innovation, but these standards have to be achievable as well.
2. This means that **clear and long-term roadmaps** have to be developed in order to respect the need for this very complex sector with its extended supply chain to have investment and planning security, to synchronise investments with product cycles and to reach the EU's sustainable development objectives for industry (which must be able to amortise the extra investments in research and equipment in a normal timespan) and consumers (additional costs should be covered by lower fuel consumption). Emissions standards should support both environmental and industrial objectives. They should support industry in continuing to develop/implement low carbon technologies. For IndustriAll Europe, being at the cutting edge of fuel efficiency will contribute to a more sustainable automotive sector. At the same time, this will support the competitiveness of the sector, create markets for new technologies and have a positive impact on employment. Finally, reducing fuel imports leads to an increase in a country's internal purchasing power, which supports other sectors of the economy.

- As the projected future market penetration of ultra-low carbon vehicles entails considerable economic and technological uncertainty, **industriAll Europe proposes applying future emission standards to conventional powertrains (including the hybridisation of the internal combustion engine) only**. IndustriAll Europe supports stringent emissions' regulations with a view to maximising the efficiency of conventional technologies. Additional costs should be covered by lower fuel consumption.
 - IndustriAll Europe is convinced that further CO₂ reduction potential for ICE-cars exists. However, it would be difficult to maintain the linear reduction rate of 2% from the past because of physical limits to further downsizing and optimising. Therefore, the potential for equipping ICE-powered cars with an alternative energy source (e.g. regenerative braking energy to assist the engine) must be fully realised in order to achieve a yearly reduction of CO₂ by at least 1.5% until 2030.
 - Furthermore, the ambition for significant further reduction of real life emissions must be maintained (e.g. by means of hybridisation).
 - Finally, as technology is progressing rapidly, industriAll Europe proposes to make regular assessments of the implementation of the new emissions standards and to take into account new technological developments.
3. More stringent emission standards have to be achieved in a technology-neutral way. As diesel engines (10 to 20 per cent less CO₂ output) are necessary to reach the demanding European CO₂ targets as of 2020, and as it is a key technology for the European car manufacturers, diesel deserves further support as a transitional technology. However, clean diesel will require an obligation on the part of industry to outfit all new models with an NO_x storage catalytic system or an SCR (Selective Catalytic Reduction system. Also, CNG (Compressed Natural Gas) has to be supported as a promising and clean alternative to other fossil fuels.
4. Before setting new emissions limits for 2025 and beyond **industriAll Europe demands a full social and economic impact assessment** of their potential impact on the EU automotive supply chain and a proper social dialogue on the outcome of these assessments. It must be remembered that too high emission standards may lead to considerable increase in the purchase price per vehicle, while the willingness (and the potential) of car buyers to pay more for functions that do not immediately enhance safety or comfort has its limits. This could pose a threat to jobs.
5. At the same time, **it is essential to foster the introduction of ultra-low emitting cars onto the market**, which have the potential to achieve even greater overall CO₂ reductions. The next logical step to drive down emissions is the electrification of transport. Therefore, full support should be given to the development and roll-out of electric cars, plug-in hybrids, hydrogen and other fuel-efficient models. This should ensure that Europe becomes a leader in electro-mobility. Coordinated and ambitious programmes to promote the uptake of electrical cars with a view to increasing the market **share by at least 1% per year** should contain:
- a. Upfront incentives that cover the price difference with ICE cars (subsidies, tax breaks, VAT rebates)
 - b. Reduction of operating costs: parking fares, discounted tolls, discounted electric charging
 - c. Non-financial operating incentives: priority lanes, access to city centres, preferential parking spaces, new mobility concepts in urban areas
 - d. Development of leasing contracts based on the lifecycle cost of EV's as well as leasing contracts for the battery
 - e. Public and private funding of battery-charging infrastructure and harmonising standards for charging infrastructure

- f. Special attention (e.g. by mandatory objectives) should be given to car-sharing systems, taxis, fleet owners and utility vehicles, which pay a lot of attention to the total cost of ownership. The market pull provided to these early adopters could provide the economies of scale needed to reduce costs.
- g. Public procurement (public transport fleets)

The uptake of low carbon vehicles must be supported by ambitious programmes to support R&D in alternative powertrains and by an active industrial policy to develop the full value chain (batteries included) for electric vehicles inside the European Union.

6. **The electrification and digitalisation of transport is a major technological transformation** which will entail profound structural change in the economy and society. It will have a massive impact on employment and skills, on the structure of the sector, the distribution of the value added in the supply chain, the division of labour between Original Equipment Manufacturers (OEMs), ICT companies, suppliers, etc. Currently one out of three automotive workers is at risk as they are employed in the value chain of conventional drive trains). IndustriAll Europe therefore insists that all programmes regarding the promotion of electro-mobility are accompanied by social impact assessments. At the same time, this should be complemented by industrial policies to maintain and strengthen the presence of European companies in the full supply chain (e.g. battery technologies) and to ensure the industrial reconversion of regions that are adversely affected by this major technological disruption. A 'just transition' for the workers concerned should be ensured by income guarantees, a smooth transition to new jobs, re-training facilities, etc.
7. Reducing transport emissions can only be achieved when forms of transport other than passenger cars and LCVs also meet ever stricter CO₂ standards. **Aviation and shipping will also have to contribute** to the achievement of the EU's ambitious climate objectives.
8. Reducing emissions and promoting electro-mobility have to be part of a **holistic mobility strategy**. Our transport system must live up to the changing needs of consumers and the societal demand for sustainable development. The creation of a Single European Transport Area, a more efficient use of transport fleets, a modal shift to less greenhouse gas-intensive modes of transport, the integration of (connected) cars and public transport, the development of charging infrastructure for alternative fuels and the introduction of traffic management systems to monitor traffic flows all contribute to more environment-friendly transport systems within the EU.
9. There are interested parties calling for a policy overhaul by incorporating road transport into the EU Emissions Trading System (ETS). The only way (as it is difficult to measure the CO₂ emissions from millions of exhaust pipes) to do so is by obliging fuel suppliers to buy emissions rights, the cost of which would then be passed on to the final consumer in the form of higher fuel prices. However, even at a price of €25/t CO₂ (the current price is only €6) this is equivalent to an increase in the price of petrol of only €0.06/litre. It should be clear that this will not really change consumer behaviour and that the incorporation of road transport into the ETS will not achieve the required emissions reductions. **IndustriAll Europe is against the idea of incorporating road transport into the ETS as:**
 - a. the price signal provided by the ETS will be too weak and also too indirect to promote low-carbon research with automotive suppliers;
 - b. it will not contribute to the development of low-carbon technologies in the transport sector and will not therefore contribute to the long-term competitiveness of the sector.
10. **Cars must remain affordable for ordinary people.** Even if stricter emissions standards reduce fuel costs, higher purchase prices of cars due to low-carbon technologies constitute a serious barrier for

people on moderate incomes. Reasonable pay-back periods (e.g. 5 years as a maximum), attractive financing formulas that reflect the total cost of ownership or mobility services such as car sharing should therefore be developed (according to an International Council for Clean Transportation (ICCT) study an emission value of 75g/km will translate into an additional retail price of €1 440 to €3 528 per car).

11. Finally, industriAll Europe is strongly in favour of:
 - a. developing **incentives to rejuvenate the ageing European car fleet** and to replace older cars with new and less polluting ones in order to ensure that CO₂ reduction policies are implemented also at the level of EU Member States;
 - b. complementing CO₂ regulations with **strategies to reduce the environmental impact of automobiles over their full life cycle** (the production and recycling of cars included).
12. The recent emissions-cheating scandals have shown that self-regulation in the automobile industry does not work, as it led to a growing gap between lab tests on “rolling roads” and what cars consume and emit in real-world use. Therefore, the Worldwide Harmonised Light Vehicles Test Procedure (WLTP) has to be introduced without further delay. To restore the credibility of the sector and consumer confidence, the testing has to be carried out and controlled by independent government bodies. Future emission standards must also be based on real life driving conditions. It is no longer acceptable that car manufacturers try to sell cars by misinforming the public. Honest information is also a way to show respect to the workers who do their best on a daily basis to deliver reliable and high-quality products. Finally, industriAll Europe insists on more transparency regarding real emission values and real fuel consumption, as well as on the results of research on decarbonisation technologies.

Conclusion

There is no doubt that the CO₂ regulations for the car industry have triggered innovation and contributed to the global position of the sector. Although highly controversial, emissions standards have helped to maintain high-quality jobs with both OEMs and suppliers. Policies to promote means of transport emitting low levels of CO₂ have to be ambitious in order to be in line with the EU’s climate objectives. Given the considerable uncertainty surrounding the market uptake of electric cars, industriAll Europe supports the idea of setting new CO₂ emissions’ targets, but only for Internal Combustion Engine (ICE) cars. **The goals need to be technically achievable and economically viable and must not put jobs at risk.** On the other hand, programmes and regulations should be designed to promote the roll-out of alternative powertrains. This should stimulate the decarbonisation of the transport sector, provide investment certainty to the industry and maintain Europe’s global leadership in cleaner cars. As this is a major societal, economic and technological disruption, clear and long-term roadmaps have to be established to accompany the transition.

IndustriAll Europe is of the opinion that a twin strategy based on:

- **reducing the real-life CO₂ emissions for ICE-cars by at least 1,5% per year until 2030 (e.g. by realising the full potential of equipping ICE-powered cars with an alternative energy source) and**
 - **increasing the market share of EV’s by at least 1% per year until 2030,**
- is environmentally ambitious, economically realistic and socially acceptable.**

The uptake of low-carbon vehicles must be supported by an ambitious industrial policy to support R&D in alternative powertrains, to develop the full value chain (batteries included) for zero emission vehicles inside the European Union, to upskill workers and to maintain and create jobs in this key sector of the European manufacturing industry.

In this way, the EU should be capable to create added value for:

- **the workers: by maintaining global leadership in fuel-efficient technologies, the sector will be able to create/maintain high quality jobs;**
- **the environment: lower emissions and a more efficient transport system via connected transport systems;**
- **industry: the development of advanced technologies in the automotive sector with its large supply chain will contribute to the achievement of the objective set by the Commission to increase the share of manufacturing in the EU's Gross National Product to 20%.**