



European
Automobile
Manufacturers
Association

ACEA Position Paper

REDUCING CO₂ EMISSIONS FROM PASSENGER CARS AND LIGHT COMMERCIAL VEHICLES POST-2020

MAY 2016

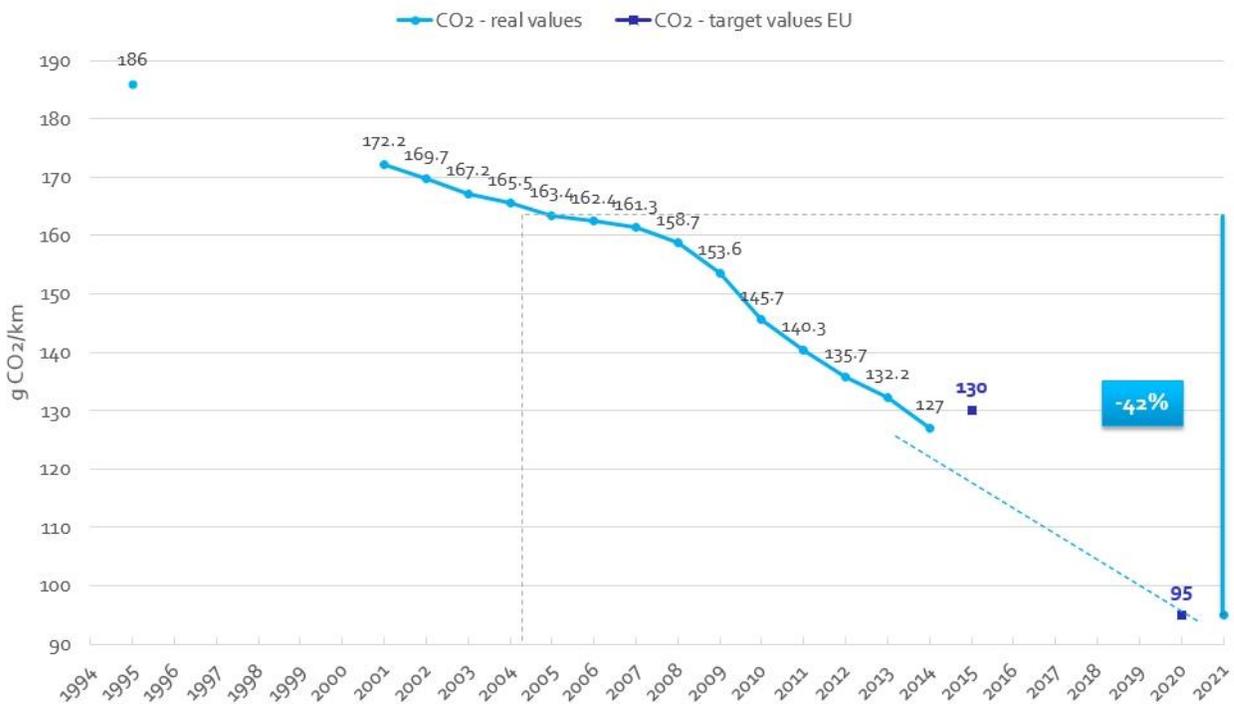
EXECUTIVE SUMMARY

1. Europe's automobile manufacturers are committed to mitigating the effects of climate change by further reducing CO₂ emissions from passenger cars and light commercial vehicles after 2020 within the framework of the EU 2030 energy and climate package.
2. Last year, average new car emissions were 33.7% lower than two decades ago, at 123.4g CO₂/km compared to 186g CO₂/km in 1995. This is the result of the long-term efforts of the automotive industry.
3. As a result of the sector's continuous investments in innovation, becoming so one of the most committed industrial sectors in this respect (manufacturers' overall investment €41.5 billion in 2014), CO₂ emissions from new cars will be almost 42% lower in 2021 than in 2005.
4. Current CO₂ legislation solely focuses on reducing emissions from new cars and vans. However, if we want to reduce emissions further, all stakeholders need to join forces for a 'comprehensive approach' that also looks at the impact of the use of vehicles on emissions.
5. Such a holistic approach can reduce CO₂ emissions more effectively by drawing on a full spectrum of solutions, whether this relates to the vehicle itself, alternative powertrains, faster fleet renewal, intelligent transport systems (ITS), improving infrastructure or altering driver behaviour. Combined with the industry's continuous improvements to car technology, these measures have the potential to combat CO₂ emission more successfully.
6. The market uptake of vehicles with alternative powertrains has to be fully developed in order to contribute to meeting the post-2020 emission targets. Therefore third party investment in infrastructure is necessary.
7. Diesel engines will continue to play a crucial role in meeting future CO₂ targets. Diesel vehicles emit up to 20% less CO₂ emissions per kilometre than equivalent petrol-powered vehicles.
8. The automotive industry faces higher reduction targets than any other sector in the EU. While CO₂ emissions from cars need to be reduced by 42% by 2021 from the 2005 baseline, ETS sectors are required to reduce emissions by 21%, and 10% is expected from non-ETS industries (2020 targets with the same 2005 baseline). Policy makers should ensure equivalent conditions and targets for all industrial sectors, taking action where the greatest effects can be achieved at the lowest costs.
9. In addition, the auto sector is one of the most regulated in the EU. Between 1998 and 2011, regulatory requirements increased production costs by 3-4% per year, and more recent environmental regulations are expected to add a further 16% to manufacturing costs by 2020.
10. New post-2020 CO₂ targets can only be set once WLTP has been fully implemented. After all, industry cannot estimate future CO₂ targets without having WLTP and its procedures clearly defined.
11. The EU automotive sector is the backbone of the European industry, providing jobs to 12.1 million Europeans. It is therefore important to develop a policy framework that allows us to drive down road transport emissions, while at the same time protecting the sector's competitiveness, and thus jobs and economic growth in Europe.

INTRODUCTION

The members of the European Automobile Manufacturers' Association (ACEA) are fully committed to further reducing the CO₂ emissions of their vehicles. No other industry has done as much as Europe's automotive sector to drive down emissions in recent years. Compared to 1995 figures, today's average emissions from newly-registered vehicles within the EU have decreased by 33.7%; by 2021 those emissions will have fallen with 42% when compared to 2005. Building on this track record, ACEA wants to contribute constructively to the debate on post-2020 CO₂ targets.

CO₂ REDUCTION RATES OF PASSENGER CARS IN THE EU



Europe is entering into the next phase of defining new climate objectives for 2030, both at the European and global level, following the recent COP21 conference. At the same time, the automotive industry is actively contributing to the development of the new test cycle (WLTP) to measure emissions, which is expected to be introduced around 2020. However, for the moment there is still a lot of uncertainty with regard to the implementation of WLTP and related testing conditions. For that reason, it is important to properly implement the new test cycle before setting targets for the period after 2020.

At the same time, policy makers need to strike a greater balance between the different world regions, and between environmental protection and the competitiveness of the auto industry. Future policy should also

reconcile the share of responsibilities between stakeholders. By definition, manufacturers don't have all of the answers to questions about how cars are used by drivers. Before tabling a new proposal, it is also important to examine in greater depth those factors beyond the responsibility of manufacturers that also contribute to CO₂ emissions. ACEA calls upon EU policy makers to ensure that a future policy framework takes a more holistic approach to reducing CO₂ emissions, especially when compared to current legislation.

COMPETITIVENESS AND THE REGULATORY FRAMEWORK

The automotive industry is a key pillar of the European economy, contributing 6.3% to the EU GDP and, directly and indirectly, employing 12.1 million Europeans (5.6% of total EU employment). Despite its economic importance, the sector is facing a multitude of competitive pressures:

- Following recent crisis years, demand for new vehicles is still 20% lower than in 2007;
- European manufacturers are losing their leadership in both global sales and production;
- The sector continues to suffer from overcapacity as a result of the 2007 crisis, despite an increase in global sales equal to the EU's entire production;
- The sector's market share has not improved in the European Union or abroad.

At the same time, the automotive sector is also one of the most heavily regulated industries in the EU, and indeed elsewhere. EU regulations relating to safety, the environment, the type approval of vehicles and national taxation schemes have added significantly to manufacturing costs.

McKinsey estimates that regulatory requirements increased production costs by 3-4% per year between 1998 and 2011 [1], and more recent environmental regulations are expected to add a further 16% to the average manufacturing costs by 2020. The large number of new initiatives in the European Commission's pipeline, including new CO₂ standards for the post-2020 period, will increase manufacturing costs further.

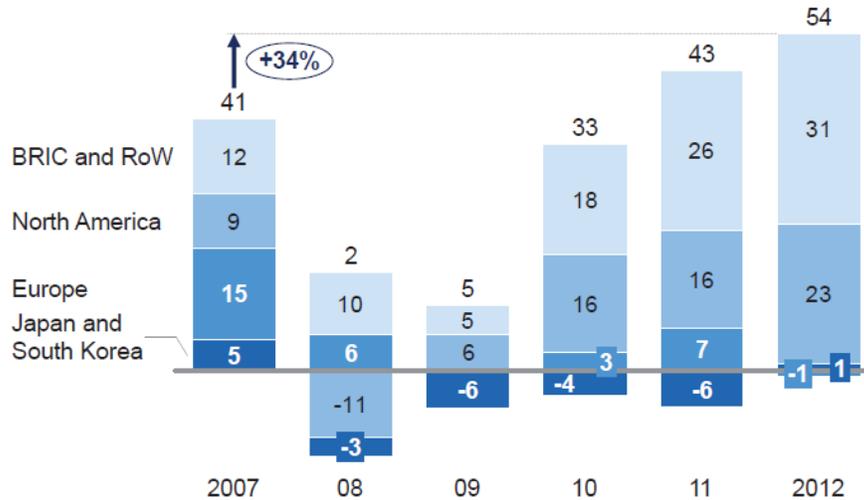
Today's regulatory requirements have resulted in high costs, which cannot be passed on to consumers due to extreme competition on the European market. Consequently they have to be absorbed by the industry. As a result, Europe's automotive sector is losing its global competitiveness. The graph on the following page clearly illustrates the negative profitability (net lost) of the sector in the European Union during recent years [2].

¹ McKinsey "The road to 2020 and beyond", 2013, page 10 - http://www.mckinsey.com/~media/mckinsey/dotcom/client_service/automotive%20and%20assembly/pdfs/mck_the_road_to_2020_and_beyond.ashx

² McKinsey "The road to 2020 and beyond", 2013, page 7 - http://www.mckinsey.com/~media/mckinsey/dotcom/client_service/automotive%20and%20assembly/pdfs/mck_the_

GLOBAL PASSENGER CAR PROFIT DEVELOPMENT BY GEOGRAPHY

EURO billions



The European Commission's ambition for the year 2020 is to boost growth and jobs by maintaining and supporting a strong, diversified and competitive industrial base in Europe. This includes increasing industry's share of GDP to 20% by 2020, from 15 % in 2013.

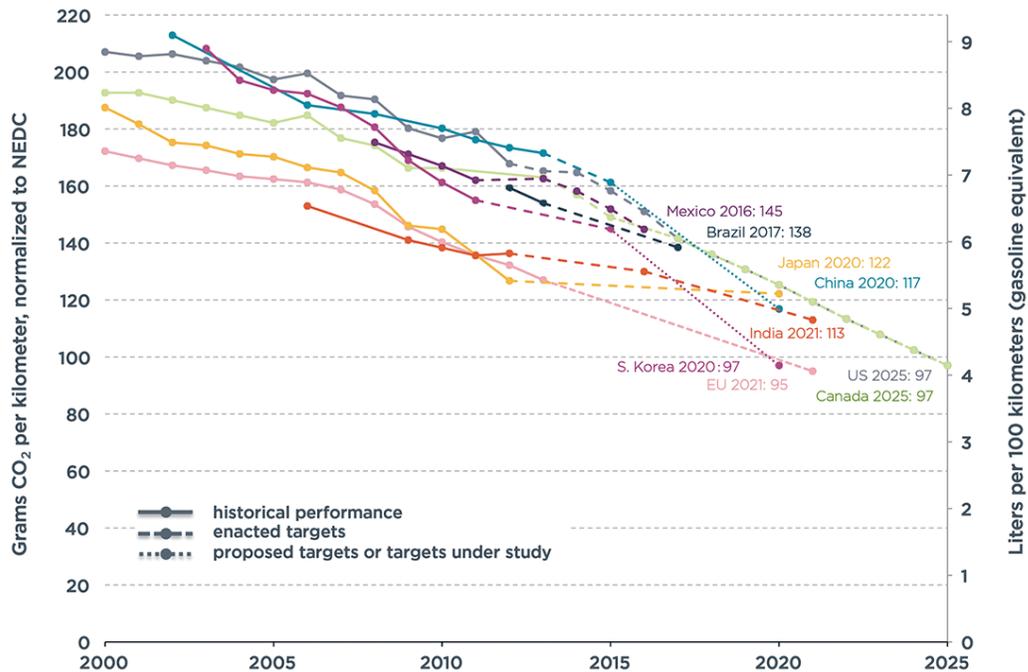
However, when taking the competitive pressures on Europe's automobile industry into account, the prospect of an 'industrial renaissance' for the automotive sector appears increasingly unrealistic. In reality, the sector sees disinvestment and financial losses – both potentially self-reinforcing.

GLOBAL TARGETS

Although fleet targets in different regions are not directly comparable (due to different tests and market conditions), it is clear that the EU targets for 2020 are among the most stringent in the world. As the ICCT chart on the next page illustrates, the EU's target of 95g CO₂/km is far more stringent than those of other major emitting economies: USA 121g CO₂/km; Japan 105g CO₂/km; China 117g CO₂/km [3].

For this reason, proposals for a post-2020 framework should be in line with global efforts, reflecting the outcome of the COP21 climate change conference in December 2015. Political leaders should ensure conditions and targets that are equal to those for industrial sectors around the world.

³ http://www.theicct.org/sites/default/files/ICCT_PVStd_Aug2011_web.pdf



CROSS-SECTORAL EU TARGETS

Although Europe's automobile manufacturers have reduced CO₂ emissions from production processes by 27.4% over the past decade^[4], the fact that nearly 18% of the EU's total carbon emissions arise from the use of vehicles (passenger cars and commercial vehicles) on Europe's roads has formed the basis for setting sector-specific targets. In comparison, the power generation sector accounts for 29% of carbon emissions in Europe, but is covered by the EU Emissions Trading System (ETS). Moreover, the abatement potential in the transport sector is smaller and reductions are more expensive than in any other sector. While the transport sector's abatement potential, for example, is broadly in line with that of the steel sector, investments required from the transport sector are roughly four times higher [5].

When studying these EU targets in greater depth, it becomes clear that the automotive sector is disproportionately affected by decarbonisation, facing higher reduction targets than any other sector. By 2020,

⁴ ACEA Pocket Guide, page 63: <http://www.acea.be/publications/archives/category/acea-pocket-guide>

⁵ For detailed information see FTI report available at: <http://www.fticonsulting.com/fti-intelligence/research/carbon/regulation-and-competitiveness>, page 17

for example, average emissions of new passenger cars will need to be reduced by 39% compared to their 2005 level. This compares to a 10% reduction expected from non-ETS sectors and a 21% reduction expected from ETS sectors during that same period. When looking post-2020 at 2030 targets, ETS sectors are expected to reduce emissions by 43% and non-ETS sectors by 30%.

A post-2020 regime should ensure a level playing field between the EU's industrial and transport sectors in order to distribute the regulatory burden more equally. A simple linear extrapolation of the targets for the future will not be achievable. The industry will not be able to deliver the same CO₂ reductions at the current pace on an ongoing annual basis in the long-term.

A review confirming 95g CO₂/km and 147g CO₂/km (NEDC) as new targets for 2020 for passenger cars and light commercial vehicles has been agreed recently (concluded in 2014), but there is no clarity yet as to how these targets will be met. To reach the 95g CO₂/km target in 2021, the impact on competitiveness (ie profitability, growth, jobs, innovation, etc) of the European automotive industry must be carefully assessed. Therefore, ex-post assessments of the 443/2009 and 510/2010 regulations (relating to the emission performance standards for new passenger cars and vans) must be conducted.

Furthermore, in line with the agreed 2030 energy and climate package and relevant impact assessments, the 40% GHG reduction target and share of 27% renewables [6] (based on the 2005 baseline) could be, under certain conditions, achievable without changing the 95g CO₂/km target for 2030. This is based on an analysis conducted by the European Commission, which was accepted by the Head of States and Governments of the EU member states.

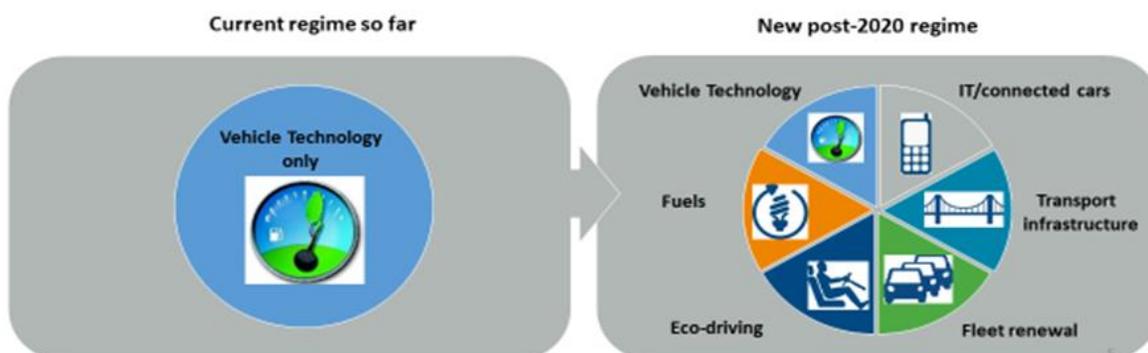
Manufacturers have innovated, and have absorbed most of the associated costs. This includes investments in efficient diesel vehicles, and other alternative technologies. However, the low hanging fruit is gone, and as we go forward, it gets more and more difficult and costly. Therefore, alternative ways of further reducing CO₂ emissions should be explored, focusing particularly on fleet renewal and on coordinated support for alternative fuels.

A COMPREHENSIVE APPROACH TO REDUCING EMISSIONS

Reducing CO₂ emissions from the use of vehicles has enormous potential. Most CO₂ emissions from vehicles do not come from new vehicles, but from those that have been on the market for some time and therefore do not carry the latest technologies.

6 See impact assessment of the 2030 climate package: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52014SC0015>, p.41 and following

Hence, ACEA believes that any post-2020 scheme should effectively address factors besides the vehicle itself that influence total CO₂ emissions. In this context, a full menu of options should be considered for the future reduction of emissions. Although the overall policy framework covers partially other relevant policy areas like carbon fuel content or others, still major focus is mainly on vehicle technology.



Fuel options

As there are technical limits to the improvements feasible for conventional powertrains, more alternative powertrains will be required to reach the 95 g/km CO₂ and 147 g/km CO₂ targets. Given the higher costs of developing most of these technologies [7], this will also affect the affordability for consumers of these alternative mobility solutions. Hence, it is necessary to first assess consumer uptake and the impact of an increased and wider portfolio of alternative powertrains over the few next years before industry is in a realistic position to make any new commitments beyond 2020.

When looking at the potential of alternative fuels, future proposals should take into account the reality of today's market. Several factors (eg the lack of infrastructure and non-harmonised supportive schemes on the national level) are limiting a substantial uptake of such technology. The overall market uptake of vehicles with alternative powertrains (including, plug-in hybrid, battery electric, fuel cell and gas-powered vehicles) still has to further improve before they can significantly contribute to the legally-mandated emission reductions.

Electrically-chargeable vehicles, for instance, are so far still a niche product with an uncertain market development and future market share. Coordinated and harmonised support at EU level for infrastructure is essential to materialise a market uptake above the 2-8% market share that is expected by ACEA in the coming decade. Therefore the internal combustion engine using conventional fuels will remain the dominant source of power for at least the coming decade. Future change must be driven by stronger consumer demand. To this

⁷ See for example McKinsey&Company; Pathways to a Low-Carbon Economy, version 2 of the Global Greenhouse Gas Abatement Cost Curve, pages 7 and 27.

end, policy makers should focus on boosting the market share of alternative powertrains through effective policy measures taken at both EU and national levels.

Europe's success in reducing CO₂ emissions has also been largely a result of its high share of diesel-fuelled vehicles. The relative efficiency of diesel compared to petrol, means that CO₂ emissions per kilometre are up to 20% less from a diesel car than from a petrol one. For this reason, several member states have encouraged the use of diesel through incentives. As a result, diesel vehicles represented 52.5 % of newly registered vehicles in 2013 (according to a 2014 EEA report). This has allowed for radical CO₂ emissions reduction as diesel technology was, and still is, a key enabler for cutting emissions. Limiting diesel vehicles in the future will significantly reduce the potential of additional CO₂ reduction.

Stimulating the use of biofuels

EU policy, in the form of the Renewable Energy Directive RED (RED) and Fuel Quality Directive (FQD), calls for limited contributions and research shows that even those are probably beyond reach. A JEC study estimated that only 4.4% of the 6% FQD target will be achieved⁸. The directives are being reviewed at this moment. As for the improvement they could generate, under the assumptions that current policy will continue in a similar form, a reduction of GHG emissions from road transport of around 8% is estimated for 2030.

Intelligent transport systems (ITS)

The wide spectrum of ITS solutions that can contribute to a comprehensive approach include, amongst others, the following high-potential measures identified by ERTICO [9]:

- Eco-navigation systems are promising applications which are already on the market, and further improvements to adapt eco-routing to traffic conditions in real-time are in development. The potential for reducing fuel use and therefore emissions is around 10% with real-time eco-routing. This potential of course can be highly variable according to the type network and journeys being made, traffic conditions, driver's route knowledge, etc.
- The in-vehicle system offering the greatest potential to reduce emissions is eco-driving. Up to 20% savings are possible, and some cases over 30%. However results again depend on the context.
- Intelligent traffic signal applications can achieve key savings, with results being around 5% for green wave applications. In-vehicle applications provide greater benefits, typically between 15-20%.

⁸ TML Leuven (<http://www.tmleuven.be/project/aceacars/home.htm>)

⁹ Based on the conclusions of the studies made by ERTICO (<http://erticonetwork.com/wp-content/uploads/2015/09/ITS4rCO2-Report-Final-2015-09-10-submitted.pdf>) and TML Leuven (<http://www.tmleuven.be/project/aceacars/home.htm>)

- Intelligent parking can reduce vehicles searching for parking places, thereby reducing traffic and hence emissions. Reductions of 7-10% in distances driven by vehicles looking for a parking space have been recorded in several studies.
- In-vehicle systems like Intelligent Speed Adaptation and Adaptive Cruise Control, including predictive data, can provide small benefits of around 3-5%.

Improving the quality of infrastructure

The biggest effect can probably be generated by properly maintaining roads, thereby keeping parameters such as macrotexture and roughness close to the optimal level. In this case, the improvement potential lies around 1-2%. Limiting road gradients is generally not considered a cost-effective manner of reducing vehicle fuel consumption, especially ex-post. Nonetheless, it should be taken on board as a factor contributing to emissions when building new roads.

Fleet renewal

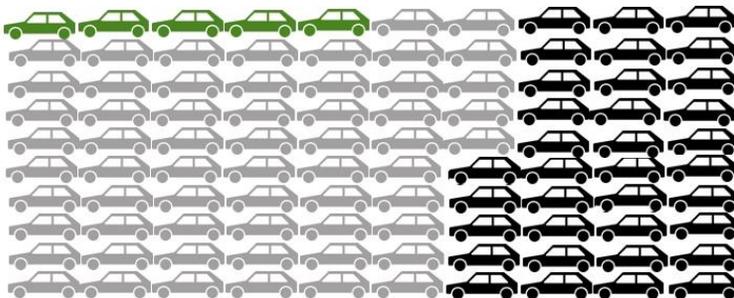
Currently, CO₂ legislation fails to address the bulk of vehicles already on the road, as targets exclusively focus on new vehicle sales. For that reason, fleet renewal incentives should be seen as one of the key tools for lowering emissions from the entire fleet. By 2030, the whole EU car fleet will emit around one third less CO₂ compared to 2005 [10] as result of the fleet renewal effect alone. This will be the result of fulfilling existing CO₂ regulations in combination with the so-called 'substitution effect' (old cars being replaced by new ones). Harmonising incentives for car fleet renewal across the EU could multiply the impact significantly.

CO₂ FROM TRANSPORT: FLEET RENEWAL IS THE KEY CHALLENGE

overall fleet of 232 million vehicles in 2011

Newly registered cars meeting
 strict CO₂ limits: ca 5% annually

Older than 10 years:
 ca 35%

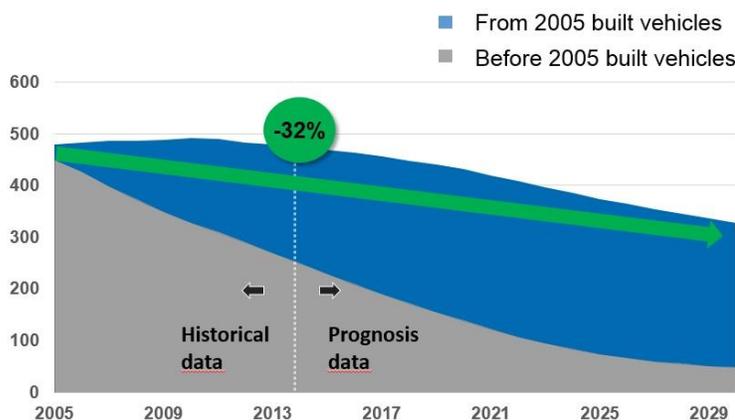


¹⁰ Based on the assumption of constant level of fleet renewal, constant level of new registrations and keeping 95g NEDC target.

ACEA's fleet renewal calculations are supported by other studies, which predict an even higher fleet renewal effect. A recent TML study [11] even estimated a 37% reduction in CO₂ emissions by 2030, with of course, declining effects after 2030. This underlines that investments made by the sector in the past will reap their benefits in coming years as a full wave of more efficient vehicles will come to the market. The significant investments of the automobile sector in the recent years should therefore be taken into account when new targets are defined for the post-2020 period. Besides the fact that fleet renewal is the most cost-efficient and, in practice, the quickest way to reduce emissions, it also stimulates private and business consumption in Europe, which is one of the key drivers of GDP growth. The average age of cars in the European Union is currently close to 10 years and is rising year-on-year. This trend needs to be reversed, so encouraging swift fleet renewal is vital.

FLEET RENEWAL EFFECT PASSENGER VEHICLES

in million tons of CO₂



Further measures

The EU ETS has been in place for about a decade now and is currently undergoing fundamental reform. Therefore it is vital to have a broad discussion on why, contrary to other major CO₂ sources, transport fuels in the EU are not included in the ETS. A data driven analysis of pros and cons should be conducted in order to replace opinions with facts.

In addition there are various measures that should be further assessed to determine their emission reduction potential – both on the vehicle and in-use side. Such measures could include for example: CO₂ taxation; CO₂ labelling; more advanced low-resistance tyres; construction-related features reducing fuel consumption and

¹¹ TML Leuven study available at <http://www.tmlleuven.be/project/aceacars/home.htm>

off-cycle technologies/eco-innovation.

Comprehensive approach: CO₂ reduction potential of various measures and applications	
Autonomous fleet renewal	37%
Eco-driving	Up to 20%
Eco-navigation	Around 10% with real time eco-routing
Biofuels	Minimum of 8% (not including ILUC)
Road infrastructure	1-2% as a result of improved maintenance and material choice
In vehicle systems such Intelligent Speed Adaptation and Adaptive Cruise Control	3-5%
CO ₂ based vehicle taxation	2-4%
Intelligent parking	7-10% reduction in distances travelled

WLTP IMPLEMENTATION

Recognising the limitations of the outdated NEDC, the automotive industry is actively contributing to the development of the new global test cycle (WLTP). However, switching to the new WLTP and its new test procedures presents a number of concerns for the industry and creates planning uncertainty for manufacturers. First of all, the complete new WLTP test (developed under UNECE) should be applicable to the measurement of all internal combustion engines as well as the alternative powertrains in a manufacturer's portfolio. Subsequently, it needs to be transposed into a robust legal framework in EU regulations. In addition to the UNECE framework, the Commission plans to add some additional elements, such as a correction of measured emissions to 14°C. At this time the official publication of the WLTP amending regulation(s) is not expected before April 2017 (this is the most optimistic date the Commission is working with).

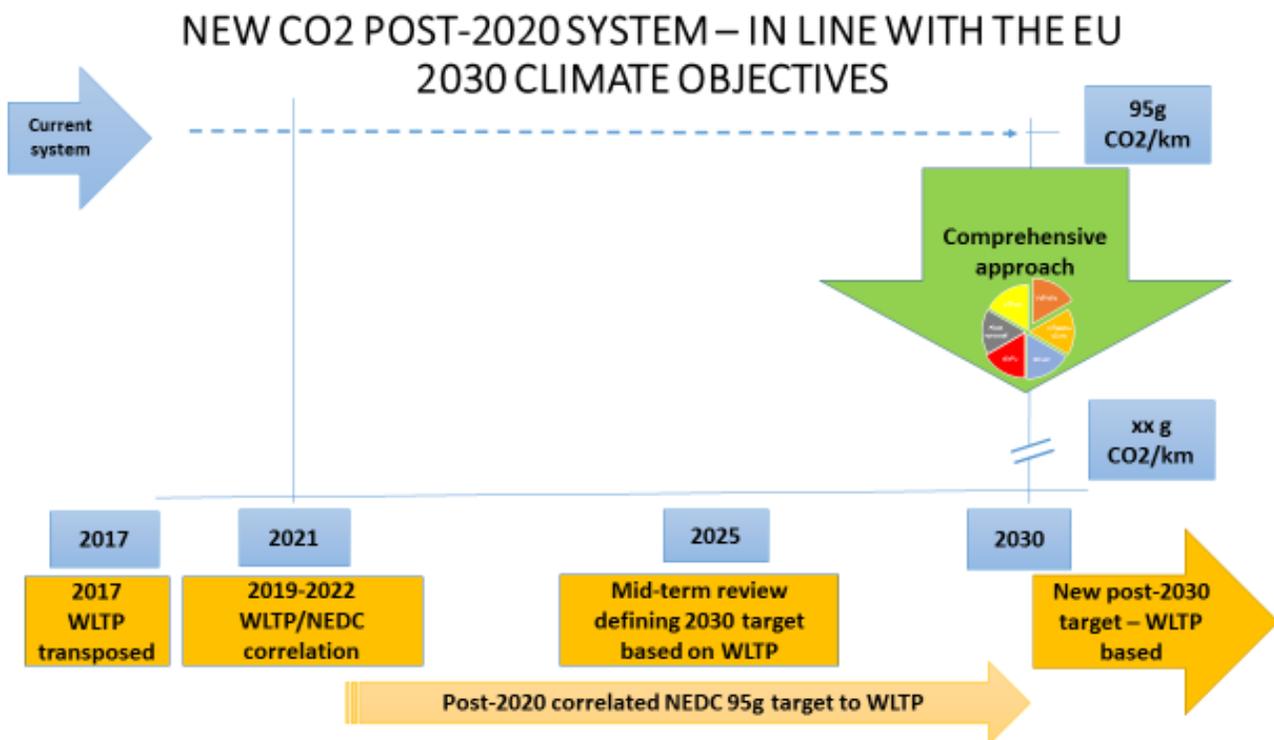
Without having the full WLTP cycle and its procedures clearly defined, industry cannot estimate future CO₂ targets. Any impact assessment related to future targets must be based on well-established and proven testing conditions.

The actual implementation of WLTP is a very complex issue, covering not only the legal procedure to implement UNECE Regulations into Community law, but also with regard to how DG CLIMA will manage the transition from NEDC to WLTP measurements, whilst ensuring that comparable stringency is maintained. This complexity also extends to the legislative work needed to allow for proper CO₂ monitoring, consumer information, taxation at the national level, emissions calculation methodology for multi-stage vehicles, end-of-life series, etc. Taking all these aspects into consideration, it is unrealistic for industry to begin vehicle testing before 1 January 2020.

However, the 2020 base year also depends on all manufacturers (of passenger cars and light commercial vehicles) having a full year of newly-registered vehicles with WLTP figures. Existing type-approval flexibility, such as end-of-series arrangements for passenger cars and completed light commercial vehicles, might add another year. This would result in 2021 becoming the base year (assuming DG CLIMA wants to keep to one base year for both cars and light commercial vehicles). In addition, the Commission's principle of 'comparable stringency' could only be robustly proven in the first year when all manufacturers, each with differing portfolios of cars and vans, have a full year of WLTP data for newly-registered products.

To ensure sufficient lead time for the industry, new post-2020 CO₂ targets based on WLTP would be appropriate for formulation as from 2030, although a 2025 date can be seen as a suitable date for a mid-term review. To provide planning certainty to automotive suppliers and manufacturers, clear rules for off cycle credits and support for cars with CO₂ emissions lower than 50 g/km (NEDC) have to be defined under WLTP.

Bearing in mind the ongoing discussions on the introduction of WLTP, ACEA would welcome an early adoption of the cycle and re-calculation of the 95g target for WLTP. Once the whole system is set up (homologation of all vehicle types, CO₂ VIN based monitoring, double testing, etc), the industry suggests to start immediately with formulating post-2020 targets based on WLTP figures.



CONCLUSION

ACEA members have made significant contributions to reducing CO₂ emissions through optimising vehicle technology, but more needs to be done to reduce emissions from the use of the vehicle. Europe's automobile manufacturers have identified a number of measures related to the usage of vehicles which can effectively contribute to the further reduction of overall CO₂ emissions from road transport through a comprehensive approach. ACEA urges the European Commission to focus on these cost-efficient measures in order to reduce emissions from transport more holistically. Greater support for fleet renewal, coordinated with streamlined incentives for low-emitting vehicles could help to reduce CO₂ emissions significantly and lower overall energy consumption in the EU. If the deployment of low emission vehicles is not supported by stimulated, market-driven consumer demand, a future reduction of targets is likely to be excessively difficult to achieve.

Bearing in mind the complexity and difficulty of thoroughly implementing the WLTP in all relevant areas (labelling, taxation, CO₂ monitoring, CO₂ flexibilities like eco-innovations or super-credits, etc), industry believes that the rational approach would be to start discussions on a post-2020 CO₂ framework after the details of the WLTP are fully defined.

An ex-post evaluation of the results of the 443/2009 and 510/2010 regulations and thorough competitiveness proofing should be conducted before any initiative is undertaken by the Commission to set future targets for vehicles. The 2020-2030 period should be seen as a transition period that allows industry to adapt itself in line with the pace and timetable of greenhouse gas reductions targets and WLTP implementation.

To conclude, the European automotive industry has been working hard to drive down emissions by investing in new technology. However, effectively joining forces to reduce CO₂ emissions will allow us to drive down total road transport emissions more effectively, and will also ensure that Europe's strategic automotive industry retains its competitiveness in the decades to come. Therefore, future CO₂ targets should assure that comparable efforts are made by all sectors, in Europe and around the world. Only a level play field between sectors and countries will allow the automotive industry to make long-term investments to tackle future challenges.



European
Automobile
Manufacturers
Association

ABOUT ACEA

ACEA's members are BMW Group, DAF Trucks, Daimler, FIAT Chrysler Automobiles, Ford of Europe, Hyundai Motor Europe, IVECO, Jaguar Land Rover, Opel Group, PSA Peugeot Citroën, Renault Group, Toyota Motor Europe, Volkswagen Group, Volvo Cars, Volvo Group. More information can be found on www.acea.be.

ABOUT THE EU AUTOMOBILE INDUSTRY

- Some 12.1 million people - or 5.6% of the EU employed population - work in the sector.
- The 3.1 million jobs in automotive manufacturing represent 10.4% of EU's manufacturing employment.
- Motor vehicles account for €396 billion in tax contribution in the EU15.
- The sector is also a key driver of knowledge and innovation, representing Europe's largest private contributor to R&D, with €41.5 billion invested annually.

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