

# Cars and vans CO2 regulations: even ambitious EU standards deliver less than half transport emission reductions needed to meet 2030 climate targets

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## Summary

Road transport is one of the few EU sectors where CO2 emissions continue to grow. To address the problem, the Commission plans to publish its proposals on car and van CO2 standards in November, followed by fuel efficiency standards for trucks in early 2018. Using its new EUTRM model, Transport & Environment has analysed the emission reductions of different ambition levels and their contribution to help achieve the 2030 non-ETS targets required from road transport. The key results are:

- ❖ Even the most ambitious standards analysed only deliver half the reductions required from road transport in 2030, leaving member states with a large CO2 gap to close with additional policies
- ❖ Without intermediary targets in 2025 much CO2 reduction is delayed, halving the cumulative emissions cuts by 2030 and jeopardising achieving the ESR goals cost-effectively.

Ambitious CO2 standards of 45% reduction for cars and 40% for vans in 2030, with mandatory targets in 2025, are cost-effective and essential for member states to comply with the Effort Sharing Regulation and for Europe to achieve its 2030 climate goals.

## 1. Background

Transport is now Europe's biggest climate problem. According to the European Environmental Agency (EEA), road transport is now the EU's single largest source of emissions, responsible for 20% of greenhouse gases.<sup>1</sup> It is also one of the few sectors where CO2 emissions continue to grow – by 1.6% in 2015.

The new EU Effort Sharing Regulation (ESR) sets an EU-wide target of a 30% reduction by 2030 (on 2005 levels) to be achieved through 28 national CO2 reduction targets (of up to 40%) in non-ETS sectors (road transport, buildings, agriculture, waste, etc). Transport represents 35% of total ESR emissions and considerably more in some EU countries. Delivering these ESR targets will require ambitious new post-2020 car and van standards as these are responsible for 73% of the road transport CO2.

The EU CO2 standards for light-duty vehicles are the principal instrument across the EU single market to reduce emissions from road transport. Setting 2025 and 2030 targets for cars and vans, together with new fuel efficiency standards for trucks and buses, is indispensable for achieving Europe's climate goals. These

<sup>1</sup> EEA, 2017, <https://www.eea.europa.eu/highlights/eu-greenhouse-gas-emissions-from-transport-increased>

standards drive technological change, and in their absence Member States will be required to adopt extremely strong measures to constrain mobility such as large increases in fuel duty and vehicle taxes.

## 2. Scenarios analysed

The European Commission is expected to present its proposals for post-2020 CO<sub>2</sub> standards for new cars and vans in November 2017, with heavy duty standards expected in early 2018. The Commission has indicated it is considering a range of ambition levels and this briefing analyses a range of different reduction scenarios and their contribution to the 2030 ESD target.

For the purposes of this exercise, transport is only expected to do its fair share within the ESR and contribute 30% of CO<sub>2</sub> reductions EU-wide. This is equal to 264 Mt savings of CO<sub>2</sub> needed by 2030. However, other non-ETS sectors such as agriculture and buildings are politically difficult and financially expensive to decarbonise – so in reality road transport is likely to need to deliver **more. The results are derived from T&E's European Transportation Roadmap Model (EUTRM).** All the assumptions are explained in the annex. The following scenarios have been analysed:

1. Scenario 20: This is based on the position of the European Association of Automotive Manufacturers (ACEA) of 20% reduction target for new cars in 2030, 13% for new vans and 10% improvement for new trucks (EU Monitoring & Reporting legislation only). This is also known as the ACEA scenario.
2. Scenario 30: This includes a 30% target for new cars and 30% target for new vans in 2030, together with a 20% efficiency improvement for trucks delivered through Monitoring and Reporting plus a new standard.
3. Scenario 35: 35% CO<sub>2</sub> reduction for cars in 2030, 35% for vans and 20% for trucks (as above).
4. Scenario 40: 40% CO<sub>2</sub> reduction for cars, 40% for vans and 20% for trucks.
5. Scenario 45: 45% reduction target for cars, 40% for vans and 30% for trucks. This is also known as the T&E scenario as the preferred option for 2030.

Apart from Scenario 20<sup>2</sup> and modelling for trucks, the other scenarios were modelled twice: with mandatory fleet-average targets for carmakers in 2025 and 2030 (the default option in the table below), and with a 2030 target only (for comparison in the later section).

The results - both in terms of quantitative CO<sub>2</sub> reductions in 2030 and contribution to the ESR transport targets - are summarised in the table below:

Scenario	Contribution to transport ESR target in 2030	CO <sub>2</sub> emissions reduction in 2030
<b>Scenario 20 (ACEA)</b>	12%	32 Mt
<b>Scenario 30</b>	31%	81.5 Mt
<b>Scenario 35</b>	35%	92 Mt

<sup>2</sup> ACEA is against mid-term 2025 targets, their position is available here: <http://www.acea.be/press-releases/article/co2-targets-for-cars-european-auto-industry-sets-out-post-2021-framework>

<b>Scenario 40</b>	39%	103 Mt
<b>Scenario 45 (T&amp;E)</b>	46%	121 Mt

### 3. Results

#### 3.1. Even most ambitious targets of above 40% in 2030 deliver less than half of the reductions needed from road transport in the ESR framework

The modelling of different reduction scenarios for 2030 shows that even with relatively aggressive targets (45% cars, 40% vans and 30% trucks) only 46% of the CO2 reductions required from road transport to meet the non-ETS goals is achieved. This underlines the scale of the challenge needed in the coming decade if Europe is to meet its climate objectives. It shows that even with aggressive CO2 standards for new cars, vans and trucks in place, a lot of extra national measures are needed to close the remaining large gap of a minimum 142 Mt. This arises from a number of important reasons:

1. Growing vehicle ownership and use across Europe - the projections based on predicted population and GDP growth result in increase of car km by 18%, van km by 23%, and truck tonnes-km by 25% between 2015 and 2030.
2. The efficiency and CO2 improvements from cars and vans on the road have to date been substantially lower than the laboratory values declared for the purposes of compliance with the regulation. Between 2008 – 2021 new car fleet improved by 60% in the laboratory, while on the road - only a 22% improvement has taken place. Since it is the real-world emission reductions that matter for the climate goals, more effort is now needed to offset the missed CO2 reductions.

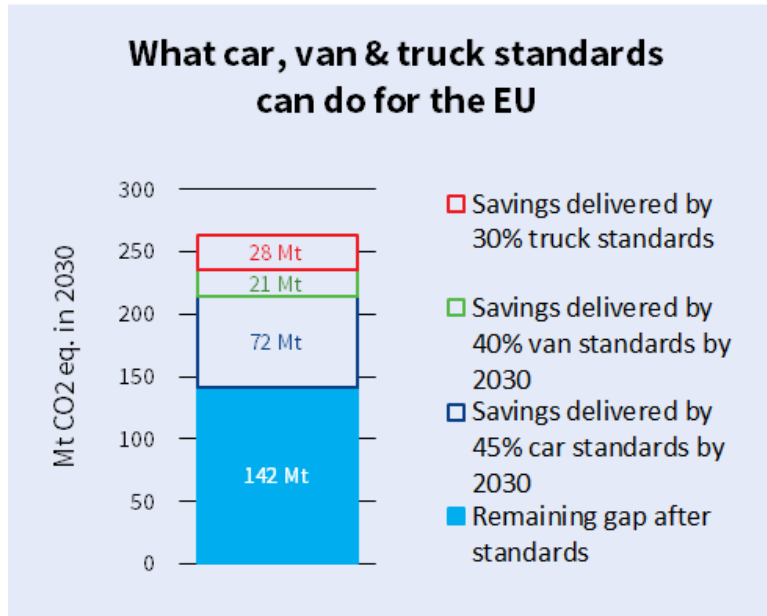
**ACEA's ambition levels are inadequate, especially given the projected demand in road transport across the EU.** Due to the reasons outlined above, **road transport's CO2 emissions decrease only by 12% in 2030** in the ACEA scenario, despite the 20% and 13% targets for new cars and vans accordingly. In some sectors, e.g. the van fleet, hardly any real CO2 reductions will be achieved as most emission cuts will be counterbalanced by a growing number of vehicles.

This means that Member States will have to introduce and deliver additional policies to reduce CO2 emissions from transport, such as reformed fuel taxes, road charging, modal shift, decarbonised fuels, etc. Importantly, the T&E model already includes policies such as continuing use of biofuels and uptake in advanced biofuels. Due to their limited supply by 2030 the biofuels policies are unable to make a significant further contribution.

The ACEA scenario only delivers 12% of the ambition necessary to meet the 2030 transport targets, or a mere 32 Mt CO2 out of 263 Mt required in 2030 for transport to deliver 30% of the ESR target. This is a huge missed opportunity given that vehicle standards are the most cost-effective means of stimulating uptake of efficient and clean technologies across the EU single market. Such low ambition puts all the burden on the member states to deliver emission reductions through other policies nationally.

The T&E scenario (on the right) makes the most valuable contribution to the transport ESR reductions in 2030, or 46%. In this scenario - with targets in 2025 and 2030 - new cars deliver 27.5% of the effort required, new trucks 10.5% and new vans the remaining 8%.

Scenario 30 delivers a 31% contribution to the ESR transport targets, leaving governments with considerable burden and missing an opportunity to achieve substantial reductions through cost-effective EU-wide standards. Scenario 40 delivers almost 40% of the effort needed, which still leaves more than half of reductions that would need to come from other measures implemented nationally and at a higher cost to consumers and industry.



### 3.2. Without 2025 targets the CO2 reductions in 2030 drop substantially

The analysis clearly demonstrates the gap in CO2 reductions depending on whether the post-2020 car and van CO2 standards are set for 2025 and 2030, or 2030 only. The graph below summarises the difference in CO2 ambition of the two options.

Scenario	Contribution of 2025 & 2030 target	2030 target only	Cumulative CO2 reductions: <sup>3</sup> 2025 & 2030 targets	Cumulative CO2 reductions: 2030 only
Scenario 20	N/A <sup>4</sup>	12%	N/A	91.3 Mt
Scenario 30	31%	21%	317.6 Mt	163.5 Mt
Scenario 35	35%	24%	357.2 Mt	177.6 Mt
Scenario 40	39%	26%	396.8 Mt	191.7 Mt
Scenario 45	46%	31%	483.8 Mt	241.5 Mt

In all scenarios (except the ACEA one) there is a substantial reduction of an additional 10-15% in the ESR with a 2025 target compared to if the targets are delayed to 2030. Based on the experience to date, car manufacturers are expected to postpone the introduction of new technologies and vehicle models in the **first half of the 2020's in the absence of a 2025 target**. This results in a significant setback in CO2 reductions and jeopardises the 2030 ESR targets. Even in the ambitious Scenario 45 the 2030 only standards for new cars, vans and trucks deliver less than a third of the transport reductions needed in 2030, undermining the potential of the EU-wide regulations to help member states meet the non-ETS goals.

<sup>3</sup> Cumulative emission savings between 2020 and 2030

<sup>4</sup> As ACEA is against 2025 targets, Scenario20 only includes a target in 2030

Crucially for the climate, the comparison of cumulative emission cuts by 2030 shows that delaying standards to 2030 halves the overall CO2 reductions achieved. For example, in Scenario 30 over 150 Mt of CO2 reduction is lost, while in Scenario 40 potential contribution is decreased by 205 Mt CO2.

## Short Conclusion

T&E modelling of different reduction scenarios by 2030 demonstrates the need for:

- Setting mandatory targets in 2025 and 2030
- Ambitious standards of above 40% in 2030

These will achieve timely and cost-effective CO2 reductions, result in efficiency improvements and introduction of new technologies sooner and to ensure the standards help member states deliver their challenging ESR goals.

## Further information

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## Annex: Detailed assumptions for constructing scenarios on CO2 reductions to 2030

To model the scenarios in this briefing, T&E has used its in-house model, the EUTRM (European Transportation Roadmap Model), **which is based on the ICCT's global transportation roadmap model (GTRM)**. The EUTRM is a demand driven model that has recently been upgraded to compute GHG emissions in yearly intervals between 2015 and 2030. Transport and freight demand are based on purchasing power parity (PPP) adjusted GDP, which is determined by historical and projected gross domestic product (GDP), population, and fuel price for each country. Thus, the predicted increase of per capita GDP (wealth) and population in Europe results in an increase of demand for transport and freight. In lieu of policy decisions, this new demand is only met by increasing the fleet size with new vehicle sales, *ceteris paribus*, the consequence of which is increasing greenhouse gas emissions.

In the business-as-usual (BaU) scenario, T&E assumes that new cars will meet their 2021 NEDC target of 95 gCO<sub>2</sub>/km in 2021, similarly for vans with 147 gCO<sub>2</sub>/km in 2021. The gap between real world emissions and lab emissions is taken to be 49% for cars in 2021 and 49% for vans in 2025 (40% in 2020), based on the test flexibilities analysis by the ICCT and the Element Energy.<sup>5</sup> As there is no legislated targets after these years, T&E assumes that new cars and vans do not improve their CO<sub>2</sub> emissions beyond this time. In the case of trucks (>3.5t), T&E assumes that the new fleet fuel efficiency improves gradually to a total of 10% by 2030 compared to 2010.

Due to the projected demand, the BaU scenario shows that car emissions will increase by 4%, vans by 2%, and trucks by 12% from 2015 to 2030, despite the legislation already in place for cars and vans and the assumed fuel efficiency gains from trucks.

The scenarios modelling of the CO<sub>2</sub> emission reductions for the 5 scenarios covered in the briefing takes the cumulative real-world CO<sub>2</sub> emissions for cars, vans and trucks in 2021 coupled with the 49% lab-road gap as a starting point. As regards cars and vans, T&E bases its scenarios around the proposal by ACEA, which supports a 20% and 13% improvement for cars and vans respectively, from 2021 to 2030. As ACEA do not support a 2025 target, we assume that there is no regulatory incentive to improve fuel efficiency from 2021 to 2025. Thus new vehicles only start improving their fuel efficiency by 2025 in the ACEA proposal. **This assumption is also ran in the “2030 only mode”** for the scenarios which see an improvement of between 30% and 45% for cars and between 30% and 40% for vans to show the comparison in reductions of having an interim mandatory 2025 target. In the scenarios modelled, the 2025 target is taken to be half of the 2030 levels. The only exception to this treatment is the T&E scenario of 45% by 2030, where 25% reduction is modelled in 2025.

In our modelling scenarios for trucks, we consider that the ACEA proposal of monitoring and reporting (MR) would only result in a 1% per year improvement compared to BaU. **In other words, ACEA's proposal will deliver a 10% improvement compared to 2030 BaU fuel efficiency, commencing from 2020, the expected date for MR to enter force (Scenario20)**. We treat moderate ambition truck standards assumed to deliver 20% in Scenarios 30/35/40 and a technically feasible target of 30% as proposed by T&E in Scenario45.

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<sup>5</sup> ICCT & Element Energy, 2015. <https://www.theccc.org.uk/publication/impact-of-real-world-driving-emissions/>