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Post 2020 CO₂ emission targets for cars and vans: the right level of ambition?

Workshop Proceedings



Policy Department for Economic, Scientific and Quality of Life Policies

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Post 2020 CO₂ emission targets for cars and vans: the right level of ambition?

Workshop Proceedings

Abstract

This report summarises the presentations and discussions of the workshop on “Post 2020 CO₂ emissions targets for cars and vans: the right level of ambition?” which was organised for the ENVI Committee and held on 27th March 2018.

The presentations highlighted the role of light duty vehicles in achieving emissions reductions, the proposed post-2020 targets and the increase in their efficiency, as well as the way forward for electric vehicles and the possible steps for further improvement.

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LIST OF ABBREVIATIONS

ACEA	European Automobile Manufacturers' Association
ESR	Effort Sharing Regulation
ETS	Emissions Trading System
EV	Electric Vehicle
GDP	Gross Domestic Product
GHG	Greenhouse Gases
LDV	Light Duty Vehicles
ZEV/LEV	Low or Zero-Emissions Vehicles
NEDC	New European Driving Cycle
OEMs	Original Equipment Manufacturers
SUV	Sport Utility Vehicle
TCO	Total Cost of Ownership
WLTP	Worldwide-harmonized Light Vehicles Test Procedure

EXECUTIVE SUMMARY

The workshop was chaired by Ms. Miriam Dalli, in her function as rapporteur. The workshop consisted of five presentations by high level speakers, followed by a question and answer session.

Mr. Kris Vanherle, a senior researcher at Transport and Mobility Leuven opened the workshop with his presentation on the role of light duty vehicles in achieving emissions reductions. He showed the relevance and share of emissions coming from light duty vehicles within the European Union. He emphasised that transport makes up for 20% of all CO₂ emissions in the EU and that cars and vans are responsible for 70% of the total CO₂ emissions from transport. He continued by presenting the consequences of the 2008 downturn on the transport sector, namely the short-term reduction in emissions, experienced due to the economic downturn. In view of the expected increase in mobility due to the improving economic situation, Mr. Vanherle concluded that in order to achieve further CO₂ emissions reductions in the road transport sector a stronger uptake of zero- and low-emissions mobility solutions is key.

Mr. Peter Mock, the director of the International Council on Clean Transportation Europe, presented the proposed post-2020 CO₂ standards for light duty vehicles. According to him, the proposed CO₂ reduction rate beyond 2021 falls behind the levels in the current regulation. He emphasised the fact that a higher reduction rate is technically feasible, and this would result in higher net benefits for society. The proposed electric vehicle market share requirement also falls behind industry announcements and does not foresee any penalties in case of non-compliance. On top of this, the proposed weight-based CO₂ targets are not an incentive for car manufacturers to opt for light-weight designs for their future products and is in fact promoting an increase in vehicle weight. A potential system based on vehicle size or using absolute targets would have a much greater impact on promoting measures leading to CO₂ reductions by car makers.

Mr. Nikolas Hill, principal consultant and knowledge leader in the Transport Technology and Fuels Sustainable Transport Practice Area of Ricardo Energy and Environment, highlighted the options for increasingly efficient light-duty vehicles. He stated that the analysis of historical trends shows improvements in official gCO₂/km, which have increased after implementing the regulation in the sector. However, not all gains could be attributed to technology improvements. Further reviews of available technical options to improve light-duty vehicles' CO₂ emissions and efficiency have shown there are many available options such as engine and transmission improvements, hybridisation of the powertrain and a full push towards electric vehicles. Additional reduction potential is available from measures that reduce vehicle mass, air drag and rolling resistance and auxiliary energy use. In addition to measures that reduce CO₂ emissions on the type approval test further reduction potential is available

from so-called off-cycle technologies. An important factor in the current development of average CO₂ emissions is that the share of diesel sales in key European markets has fallen for the first time in 2017 after the “dieseldate” emissions scandal. Electric vehicle and charging technology is rapidly improving. According to the latest studies, battery costs are coming down, electric range is increasing, and the total cost of ownership is reducing. As a result, all major car manufacturers foresee the introduction of semi-electrified or fully-electric vehicles in the years to come. By 2025 it is expected that electric vehicles reach cost parity and that over 50% of the car models responsible for the majority of sales in the EU will have electric equivalents.

Mr. Peter Kasten, senior researcher consultant at the transport division of OEKO-Institute, further elaborated on the way forward and the future of plug-in hybrid and electric vehicles. According to him the deployment of electric vehicles is a key element to greenhouse gas mitigation in the transport sector. He also presented the differences between the European Union, China and California in policies for promoting electric vehicle deployment. According to Mr. Kasten, the current EC proposal for CO₂ emissions targets provides a weak incentive for electric vehicle market uptake. He also explained that OEMs would need to sell a very large share of plug-in hybrids (PHEVs) if they intend to meet the ZLEV target with that technology rather than with pure EVs. He emphasised that more ambitious target levels are needed to provide a stronger incentive for manufacturers to sell zero-emissions vehicles. He also suggested a conceptual idea of combining a binding mandate, which would increase market certainty, with a non-binding crediting-system, which would increase market uptake of electric vehicles.

Mr. Richard Smokers, principal advisor at TNO’s sustainable transport and logistics department, talked about the possible steps for further improvement. According to him, the proposed targets do not utilise the full potential for CO₂ emissions reduction in cars and vans, offered by efficient ICEVs and various ZEV options, which is technically feasible and cost effective by 2025 and 2030 from an end-user and societal perspective. He further emphasised that the level of ambition is inconsistent with the 1.5 °C goal of the COP21 Paris agreement. The proposals he made focused on setting a 2030 CO₂ reduction target to a level that requires application of the full potential of internal combustion engine vehicles as well as a significant share of zero-emissions vehicles. He furthermore argued that the definition of the targets relative to the 2021 Worldwide harmonized Light vehicles Test Procedure (WLTP)-based market average introduces a strong risk of inflated WLTP CO₂ emissions values up to 2021, undermining the stringency of the 2025 and 2030 targets. A possible step could be the setting of an indicative 2030 target. This would allow the absolute target to be determined later, when the correlation between the Worldwide Harmonised Light Vehicle Test Procedure and the New European Driving Cycle is better

understood. An independent testing and validation to monitor the ratio between the two could also be considered as an important step forward.

During the question and answer session, members of the ENVI Committee, as well as external participants, raised questions and made comments regarding the existing gap between the type approval CO₂ values and real-world emissions, the available technological solutions for reducing societal dependency on internal combustion vehicles, as well as the possibility for incentive schemes to promote electric mobility and prioritise public transport for short distances.

1. OPENING REMARKS

The workshop was chaired by Ms. Miriam Dalli, in her role as a rapporteur. She began by briefly summarising the importance of the standards which were to be discussed in the context of the main topics of the discussion.

By reducing the CO₂ emissions from all new cars sold in the EU, these standards have the potential to make a significant contribution to the reduction of greenhouse gases (GHG) emissions and mitigating climate change, while at the same time delivering benefits of fuel saving for consumers. While other sectors have reduced emissions in recent years, transportation has recorded an increase in the EU since the 1990s. This has happened despite the decrease in average type approval CO₂ emissions and results from the growth in numbers of vehicles on the road, kilometres driven, a shift towards larger vehicles and a widening gap between test cycle findings and real-world emissions. Cars and vans are responsible for approximately 16% of all EU GHG emissions. Previous experience shows that the European Union should have strong legislation for the sector, since it has been proven that voluntary emissions reduction agreements do not actually deliver the expected results. This is the main reason for introducing enforceable EU targets. The transport sector knows it has to contribute to the overall GHG emissions reduction goals of the EU and in particular to reach the 60% reduction of CO₂ emissions in transport by 2050, as well as the 30% reduction of GHG emissions under the Effort Sharing Regulation (ESR) by 2030.

The aim of the workshop was to examine the proposal by the European Commission and how best to achieve the indicated goals. The experts on the panel tried to address several questions. What would be a fair contribution of the road transport sector to reach the EU climate goals? Could this be achieved by the Commission's proposal, as it stands today? What would be the right level of ambition for the road transport sector to contribute to the EU's 2030 targets for GHG emissions reduction? Could these goals be realistically achieved with the proposed measures? How can we best improve the uptake of the most efficient vehicles, including low and zero-emissions vehicles? What is the difference between binding quotas and incentive mechanisms? Which measures will have the biggest impact and what best practices exist in the international arena?

2. THE ROLE OF LIGHT DUTY VEHICLES IN ACHIEVING EMISSIONS REDUCTIONS

Kris Vanherle, Senior Researcher at Transport and Mobility Leuven.

Mr. Vanherle began by setting the scene and presenting the historical context and the nature of the discussed topics. He emphasised the relevance of light duty vehicles (LDV) in the total share of GHG emitted in the EU. The transport sector represents about 20% of the total EU CO₂ emissions. Excluding aviation and maritime bunker fuels, almost 95% of the total transport emissions are due to road transport. Out of this 95%, cars and vans combined are responsible for 70% of the CO₂ emissions. In total, cars and vans account for about 14% of EU CO₂ emissions.

Looking at the historical context and analysing trends, it is apparent that general CO₂ emissions have been declining in the past decades. This is not the case for the transport sector. Contrary to the general trend, the increase in transport activity has led to a steady increase in the GHG emissions generated by the transport sector. During the 2008 economic crisis, CO₂ transport emissions experienced a small decrease, however, they started to pick up and have continued to grow again. CO₂ emissions are generally driven by transport activities and the carbon intensity of the transport activity. There has been legislation put in place in the past to reduce the carbon emissions and increase the efficiency of the transport sector. Despite the talk of decoupling the rise of transport activities and CO₂ emissions, no decoupling has been visible so far. The gains in efficiency with the inclusion of new cars in the market has not offset the rise of CO₂ emissions.

Mr. Vanherle showed the previous legislative efforts in the field of vehicle fuel efficiency standards and their historical evolution. The first practical step was the 1998 voluntary between the agreement European Automobile Manufacturers' Association (ACEA) and the EC. It foresaw a target of 140 grams of CO₂ emitted per kilometre (gCO₂/km) for 2008. This level was not achieved and in 2008 the average level was 153.7 gCO₂/km. This failure to meet the voluntarily agreed terms has been the main push for implementing the binding target of 130 gCO₂/km /km phased in between 2012 and 2015. These levels have been achieved and as a result in 2011 additional binding targets for 2017 of 175 gCO₂/km for vans have been introduced. These levels have also been delivered and in 2014 the targets were updated to a 95 gCO₂/km for cars to be reached by 2021 and 147 gCO₂/km for vans by 2020. Early New European Driving Cycle (NEDC) tests suggest that manufacturers are on track to reach these levels.

The developments in the costs of CO₂ emissions reduction were also presented. In the case of vehicles, a more fuel-efficient car costs more to produce, but it saves on fuel costs. In terms of the net costs and benefits, the impact assessment conducted for the first set of targets showed a net cost in the bandwidth of EUR 10 to EUR 80 per gram of CO₂, including the benefit of fuel saving. The impact assessment conducted in the context of the currently proposed legislation suggest there is a net benefit for consumers and society if fuel costs are considered. The assumption of a price increase of cars has also not been as high as initially expected.

The objective of the current proposal of the European Commission from November 2017 is a further reduction of 15% by 2025 and 30% by 2030 compared to the 2021 sales averaged Worldwide Harmonised Light Vehicles Test Procedure (WLTP) value. The fact that the target is expressed in relative terms is related to the shift from the NEDC-based test procedure to the WLTP. There is also an incentive for zero and low-emissions vehicles in the form of targets of 15% for 2025 and 30% in 2030. Manufacturers that exceed these targets are rewarded with a bonus in the form of an increased overall CO₂ target. The incentive does not include a downturn potential for OEMs that do not meet the ZLEV targets.

Progress in passenger vehicles in the last couple of decades has delivered an incremental change in the internal combustion engine technology and a shift towards diesel-powered vehicles. In more recent years, there has been an increase in the uptake of electric vehicles like plug-in hybrids and fully electric vehicles. When it comes to the measures needed in the near future to achieve further CO₂ emissions reductions in road transport, the uptake of zero and low-emissions vehicles is key.

3. THE PROPOSED POST-2020 TARGETS FOR LIGHT DUTY VEHICLES

Peter Mock, Director of the International Council on Clean Transportation Europe

Mr. Mock highlighted the progress achieved so far in the field of CO₂ emissions reductions in the road transport sector. He put the Commission's proposal into historical context by discussing the development of CO₂ emissions from new cars in Europe, as well as the regulations put in place to meet the pledged targets. According to him, the proposed annual reduction rate is lower than the current one. The proposal of the Commission requires a 4% reduction in CO₂ for manufacturers on average, whereas the currently implemented set of policies requires a reduction rate just above 5%.

One argument for this is that technology harvest (i.e. the benefits of new technology) would have reached its peak and it would therefore become increasingly difficult to further reduce the levels of emissions from the current technology. According to Mr. Mock, this is completely not the case. In his view, the current situation is one of a transition towards a new technology S-curve of electric vehicles. Therefore, the speed of reducing CO₂ could, and indeed should, be higher compared to what it was in the past.

Looking at the targets proposed by stakeholder institutions, the recommendation proposed by the European Parliament back in 2013, was a target of 67 to 78 gCO₂/km for 2025, using the old NEDC procedure. This could be translated into a CO₂ reduction of 18% to 28%, which is higher than the 15% currently proposed by the Commission for 2025. This further highlights the fact that the Commission's proposal falls behind the levels proposed by the Parliament.

Looking towards the future, in order to meet the climate targets, the EU Effort Sharing Regulation requires the non-ETS sectors to reduce CO₂ emissions by 30% by 2030, compared to 2005 as a starting point. Taking the Commission proposal and running it through various existing modelling tools, results in about a 20% CO₂ reduction for the transport sector by 2030, compared to 2005 levels. This is less than the 30% required for the non-ETS sectors. The Commission argues, however, that this is not a problem since the transport sector only has to deliver between 18% and 19% of the reductions, so the proposal would be in line with that requirement. In addition to this, the expectation is that other sectors will over-comply and, in the end, the 30% target for non-ETS sectors will be reached. For this to work however, what has to be achieved, according to the Commission is a reduction in emissions of about 35% for the agricultural sector, 37% for the industry sector and 43% for the building sector According

to Mr. Mock these targets are very unlikely to be reached. This is the main reason why he argues that the transport sector should deliver at least a 30% reduction, if not more, in order to meet on average, the 30% goal in the overall sharing agreement. This is even more evident if the Member State's perspective is considered. In Germany the road transport sector is supposed to decrease its CO₂ emissions by 40% to 43% by 2030. For some Member States, it would be impossible to meet the national targets without having strong standards at EU level.

Mr. Mock further emphasised the importance of a 2025 interim target. When it comes to climate change mitigation efforts it's not just about how much lower the annual CO₂ emissions will be in 2030. It is also important when exactly the reduction takes place. The earlier the reduction of CO₂ emissions happens, the more beneficial it will be for climate change mitigation. The main point made by Mr. Mock was that the ambition level of the current Commission proposal was not high enough and it does not meet the expected EU climate goals. The question that follows is how to further decrease CO₂ emissions and is the technology ready for that. The impact assessment from the Commission's proposal analyses several scenarios ranging from 20% to 50% reduction, the technological costs for reaching the various levels, as well as the benefits and net results expected for society. Even using Commission figures, the maximum benefit for society is in the 50% reduction scenario. This is mostly due to fuel costs savings; however other benefits do exist (e.g. health benefits from air pollution). These findings also show that, even using Commission figures, technologies which would allow further reduction of CO₂ emissions exist and are cost-effective. The estimates of the ICCT also suggest that the Commission data is more conservative and even deviates from the figures they were provided by the consultants working on this topic. In the case of CO₂ reduction potential of light-weighting, the Commission reduced the potential significantly and doubled the costs, compared to what the consultant has recommended earlier.

Electrification also plays an important role when it comes to the reduction of CO₂ emissions. The benchmark crediting system, proposed by the Commission, according to Mr. Mock, makes a lot of sense because it provides an incentive for manufacturers to invest sufficiently in electric vehicle technology. It is also similar to the regulation that applies in China and California. The Commission benchmark targets, on the other hand, are not significantly advanced. They reflect what manufacturers have already publicly announced. Companies like BMW have said that 15% and 25% of all their new cars will be electric by 2025. Coincidentally, the Commission benchmark precisely reflects these targets. What is also important is that the Commission should differentiate between various types of electric vehicles and should provide lesser credit for those vehicles with limited electric range. This provides an incentive for manufacturers to develop more efficient electric vehicles that can drive further on

electricity. However, an explicit penalty is still missing from this benchmark. There is no penalty for manufacturers in case they do not reach the benchmark, and this goes against the original idea of the benchmarking system.

The Commission proposal is also not technology neutral in the sense that it discourages the use of light-weighting. The CO₂ targets of each manufacturer will be based on the average weight of their vehicles. That means that if a manufacturer makes its vehicles lighter, that manufacturer would also end up with a lower CO₂ target. This would take away quite a large share of the CO₂ savings that the manufacturers get from light-weighting. That has already been the case in the past and current regulations, however this time it is will have a significantly more negative impact. The slope that determines the relationship between the weight of the vehicle and the specific CO₂ emissions target of a manufacturer is outdated and does not reflect the current market situation. Taking the technical details aside, this leads to an instant incentive for manufacturers to increase the weight of their vehicles instead of decreasing it. In this regard it would be highly recommended to switch from a weight-based to a size-based parameter. Another option for increasing transparency would be to take away the parameter completely and to just define the same percentage reduction for each manufacturer. From a technical point of view that makes a lot of sense because today a large and heavy vehicle does not emit a lot of CO₂. The Porsche Cayenne is a prime example of that. This 2.5 tone SUV emits 80 gCO₂/km on the type approval test due to its plug-in technology. This shows how large manufacturers with a very diversified portfolio of products can reach their CO₂ targets.

Summing up, Mr. Mock further emphasised the fact that the current CO₂ reduction rate proposed by the Commission falls behind the current regulation, as well as the European Parliament recommendations and the EU's climate target commitments. A higher reduction rate is technically feasible and would result in higher net benefits for society. The proposed electric vehicle market share requirement also lags behind industry announcements and does not foresee any penalties for non-compliance. According to him, the proposed weight-based CO₂ targets will continue to dis-incentivise light-weighting, compared to a system which is based on vehicle size or that uses relative reduction targets. Without adapting the proposed slope value, each individual manufacturer has a strong incentive to increase vehicle weight.

4. INCREASINGLY EFFICIENT LIGHT DUTY VEHICLES

Nikolas Hill, Ricardo Energy & Environment, Principal Consultant and Knowledge Leader in Transport Technology and Fuels Sustainable Transport Practice Area

Mr. Hill emphasised the improvements made so far as a consequence of the regulatory targets. According to him the future improvements will only partially be the result of technical improvements and regulatory measures will play a much more important role.

Mr. Hill presented the work Ricardo Energy & Environment has done for the European Commission, namely the detailed review on the various technologies for improving CO₂ emissions from light-duty vehicles, as well as their cost and performance. Over 80 measures have been identified as available in the market place that could be introduced up until 2030. Among the most significant ones were improved engines, hybridisation, transmissions, as well as a range of electric power-trains. While most of these options generate a benefit on the type approval test, another set of options (so-called off-cycle technologies) have also been identified and the potential of these is not captured in the type approval test even though they reduce real-world emissions. Some of them could also account for, and be included in, the upcoming eco-innovation proposals. This research has been carried out in consultation with all involved stakeholder groups as well as by analysing the cost curves of conventional and electric power trains for vehicles. The results suggest that a very significant emissions reduction potential remains available, even considering the introduction in the market of already available technologies. Almost 50% CO₂ emissions reduction is still available for conventional, ICE-based vehicles. A 55% improvement is available if off-cycle technologies are included. This is important because it demonstrates that even for conventional vehicles there is significant room for further improvements. The savings potential under the new regulatory test cycles was also highlighted by Mr. Hill.

The “dieselgate” scandal had significant impacts on the sector and the regulatory base. Newer diesel fuels, which are compliant with the new Euro 6 requirements, will address the current issues of pollutant emissions from light-duty vehicles to a large extent. The scandal has also had an impact on consumers preferences and behaviour. Customers are shifting away from diesel-powered engine technology when choosing new cars. On a yearly basis, diesel-powered car sales in Germany have decreased by 13% compared to last year. That has been attributed to the increase of test-cycle based emissions. Many car manufacturers are removing diesel engine options from their line-ups. Another set of measures which further promotes those policies is the ever-stricter air quality regulations for city centres which establish low or zero emissions zones. In Germany several cities are considering tighter

air quality regulations which would impose further restrictions on diesel powered vehicles. This gap in the market is expected to be filled by hybrid power-trains and fully electric vehicles.

There has been a much more rapid uptake of electric vehicles in the last couple of years, than it was previously believed would occur. In the coming years it is expected that additional improvements in battery technology will allow for electric cars to double the range they have available now. Current trends suggest a strong market uptake of electric vehicles, which currently account for around 2% of the market. Compared to the 3% of the hybrid vehicles sales, which benefit from having been promoted for a longer period, the surge in electric powered cars is very impressive. From a total cost of ownership perspective, it is expected that electric vehicles will reach cost parity with conventional technology in the next decade. Improvements in charging technologies have also had a significant impact on the uptake of electric vehicles. The ultra-rapid charging stations have been partly sustained by bigger battery packs.

Major car manufacturers have stated that they are fully committed to deliver electric solutions in the coming years. Some of them suggest that by 2025, 25% of their sales will be of electrified models. It is important to note the distinction between electric and electrified models. Whereas the term electric implies a fully electric powertrain, electrified means an electric assist to an internal combustion engine, such as plug-in hybrids. In this respect, the manufacturers' plans to have electrified models representing almost a quarter of all new car sales in the EU by 2025, indicates an important step forward.

From the perspective of the total cost of ownership, the analysis conducted by Ricardo Energy & Environment has suggested that customers will experience price parity between conventional and electric vehicles between 2025 and 2030. From a societal cost perspective, taking taxes aside, parity is expected in the same period. If the external costs, such as GHG emissions are monetised, this also further increases the cost of conventional vehicles. Analyses from the Commission have shown that the greatest societal benefit come from a reduction of 40% or higher.

The overall conclusion presented by Mr. Hill suggests that there are many technical options available to improve efficiency of conventional powertrains and that further CO₂ emissions reduction can be achieved by alternative low or zero emissions electric powertrains. Utilisation of 'off-cycle' technical options could further reduce real-world emissions. There were also questions raised on the future role of diesel cars with respect to the cost of CO₂ reduction. Several car manufacturers are discontinuing diesel models from the market (e.g. Toyota, Porsche, FCA). Another important aspect is that the rise of

hybrids is widely expected to fill the 2020 gap at a similar or even lower cost than conventional internal combustion powertrains. The overall net reduction potential however, may also be impacted by 2030 due to the rapid uptake of electric powertrains. Electric vehicle powertrain costs are rapidly reducing, and the number of available models is also increasing. It is anticipated to cover over half of the models, accounting for 90% of EU sales by 2025. Furthermore, some studies suggest that further investment in engine improvements and R&D for conventional powertrains may be further limited.

5. THE WAY FORWARD: THE FUTURE OF ELECTRIC VEHICLES

Peter Kasten, Senior Researcher Consultant OEKO-Institute Resources, Transport Division

According to Mr. Kasten, electric vehicles are key to any sustainable solution for GHG emissions mitigation strategies in the field of road transport. Most scenarios come up with light-duty electric vehicles' use at about 80% or higher for the year 2050. Using electric vehicles is more than just replacing conventional internal combustion engine vehicles. There are systematic changes and challenges involved and a key to having a smooth transformation to a transport sector with predominantly electric vehicles will be to have a good projection of the market size and the speed of electric vehicle uptake. There is already a market for electric vehicles (EV) in the EU, however this market is currently mainly driven by demand side policy instruments, including tax benefits, driving and parking privileges, etc. In Europe there is a supply shortage due to high demand in the EV market. This might be considered as one of the reasons why China and California have adopted a binding mandate, focused on the supply side of the market for 2020 and 2025 respectively.

CO₂ regulations contain four elements which incentivise the impact on the EV market uptake. The first, and the most important one, is that the overall target level is the main incentivising parameter. There is inherent correlation between the share of low or zero-emissions vehicles (LEV/ZEV) and the stringency of the target. The second one focuses on the impact of additional LEV/ZEV incentives which depends on the type and levels that are imposed. In the current EU proposal, a non-binding crediting system is proposed with one-way adjustment. If the benchmarks are overachieved by the manufacturers their overall CO₂ target level is increased. Another factor that has to be mentioned is the eligibility criteria and weighting factors of different LEV/ZEV concepts. The last comment focuses on the fact that the enforcement of targets requires monetary penalties in order to be fully effective.

In the current proposal different types of cars are weighted in a different manner in the crediting system. ZEVs are counted as one car for the crediting system whereas plug-in hybrids account for less than one car. A typical example of a plug-in hybrid like the Volvo V60 is counted as less than 0.2 of a car in the current crediting system. This means that the manufacturer would need five of these plug-in hybrid cars to reach the same credit as one fully battery powered vehicle. This weighting function will push the industry towards the uptake of electric vehicles. It is also important to note that the benchmarks are based on full credits for electric vehicles. If a manufacturer only brings battery powered

vehicles to the market the required market share for EVs would have to be 30% to reach the 2030 benchmark. However, if a manufacturer has a fleet of both full-electric vehicles and plug-in hybrids, the actual share would have to be higher to meet the benchmark. If the average emissions factor of electric vehicles (battery electric and plug-in hybrid) remains at the current levels of 23 g CO₂/km in 2030, this would mean that the actual sales share of EVs would need to be close to 60% to meet the benchmark.

Mr. Kasten further elaborated on the CO₂ emissions targets proposed in the regulation as one of the most important factors for the successful implementation of the policies. According to him these targets incentivise electrification rather than the stronger market uptake of full electric vehicles. He presented the correlation in the scenario where if the electric vehicle share increases, the required CO₂ emissions for conventional cars automatically increase as well. The PRIMES model used in the impact assessment also had a similar level of 20% market share in EVs for 2030. This again would mean that the market incentive would be to go for an electrification scenario rather than to push for full-electric models. Several manufacturers have already published their plans for future sales. Renault, for example is aiming for two thirds of its models to be electrified by 2030. If the benchmark of 30% ZEVs is reached the required CO₂ emissions levels of conventional cars for 2030 will be higher than the required level of conventional cars in 2021. In the worst case it could also be higher than the CO₂ emissions level of conventional cars achieved in 2016. This further shows that in the current proposal the incentivising mechanism does not fit in the overall target level.

The two-way adjustment has also been discussed in the Impact Assessment. The overall target of a manufacturer is increased by 5% if the benchmarks are not met in 2025 and 2030. In this case the required CO₂ emissions level of conventional cars could be lower. The electric car segment of the market could also increase by 2-3%. Mr. Kasten further emphasised that the main incentivising parameter is the overall target level.

In his conclusion Mr. Kasten focused on the most important consequences of the proposed regulation. He again emphasised the fact that the EV market uptake is a key part of any GHG mitigation strategy in road transport and requires as much market certainty as possible. The most important aspect for him was that the current CO₂ emissions target proposals provide a weak incentive for full-electric vehicle market uptake. According to him, a more ambitious target level would be the main incentive for faster EV market uptake. One of the most prominent aspects of the current proposal, for him was that LEV/ZEV incentives do not provide market certainty in the long term. He suggested the concept of combining a

binding mandate (increasing market certainty) and a non-binding crediting-system (increasing EV market uptake) to achieve a higher market share of LEV/ZEV. He shared his belief that introducing some sort of penalties, such as a two-way adjustment mechanism and monetary fines, would also strengthen the enforcement of the regulation in the long-term and contribute to its effectiveness.

6. THE WAY FORWARD: POSSIBLE STEPS FOR FURTHER IMPROVEMENT

Richard Smokers, TNO, Principle Advisor, Sustainable Transport and Logistics

Mr. Smokers began by shortly presenting the work conducted by TNO in supporting the European Commission in the preparation of different steps of CO₂ legislation since 2004. The latest piece of work has been the assessment of a wide variety of options for legislation, making use of the cost-curves developed by Ricardo, looking at a wide range of modalities and design options with which the legislation could be better implemented. He summarised the main issues with the current proposal.

According to Mr. Smokers, the proposed targets do not consider the full potential for CO₂ emissions reduction in cars and vans that is available both from a technical and a cost-effectiveness perspective. Looking at the overall potential of what is possible in making conventional cars more fuel efficient and the fact that electric vehicles will become cost-competitive with conventional vehicles before 2030, only half of that potential is used in the current proposal. On the other hand, if the proposal is compared to what is needed in order to comply with the 1.5°C goal of the COP21 Paris Agreement, the proposal is not delivering what it should. The second important issue is regarding the way in which zero-emissions vehicles are stimulated. The final issue is the target definition and the fact that the Commission has chosen to set a reduction target relative to the 2021 Worldwide harmonized Light vehicles Test Procedure (WLTP)-based average, creating an incentive for Original Equipment Manufacturers (OEMs) to “inflate” the WLTP-based CO₂ value of cars sold up to 2021.

According to Mr. Smokers, the overall ambition level is too low and target levels are not consistent with what is possible in terms of the reduction potential of cars and vans. They are roughly consistent with what is technically and economically possible from conventional cars. If, however, the potential of ZEVs is included, a much stricter target, of at least 43% or even 50-60% is possible and cost-effective from an end-user and societal point of view. The proposal could be considered in line with the old 2°C targets, but only in a scenario with a limited growth of kilometres driven and optimistic assumptions on the availability of biofuels for cars and vans. However, with the introduction of the new 1.5°C targets it needs to have a significantly more ambitious level of ambition. Striving for the 1.5°C target requires an overall reduction of 95% in CO₂ emissions in the EU for 2050 compared to 1990 levels. This leaves a

much smaller bandwidth for dividing the burden over the various sectors. In order to increase the certainty of meeting these target all sectors should strive for 100% reduction of emissions by 2050 which doesn't leave any space for one sector to fall behind the others. In this scenario the transport sector should strive for a 100% reduction of CO₂ emissions by 2050, which again suggests a different level of ambition compared to the 60% reduction currently present in the proposal.

Another important issue, presented by Mr. Smokers were the integrated national energy and climate plans of Member States for 2030. These plans will show if and how Member States can deal with the reduction on a national level or if they need a stricter overarching CO₂ target for cars and vans at EU level. One encouraging signal comes from the new Dutch government, which foresees a phasing out of conventional vehicles and having 100% ZEV sales by 2030. In reality, the average EU improvement would probably be less ambitious. A doubling of the reductions proposed by the Commission would be needed to be on track with what the countries need to be consistent with what is requested in the COP21 Paris Agreement. The solution to this lies in more stringent targets, since requiring more than 30% would lead to further reductions in CO₂ emissions and EV market uptake, while at the same time yielding further cost reductions from an end-user and societal perspective. An alternative could be the proposal of a CO₂ target for conventional vehicles and a separate mandate for electric and other zero-emissions vehicles. An overall target however is much more effective and gives manufacturers much more flexibility in terms of how they can meet their goals.

The main issue, presented by Mr. Smokers, regarding the current proposal's role for stimulating ZEVs is the alignment of percentages. Currently the request is for a 30% share of electric vehicles and 30% reduction of CO₂ emissions by 2030. If manufacturers, however, sell 30% ZEVs in 2030, they automatically meet the CO₂ target and do not have to reduce the CO₂ emissions of conventional vehicles compared to 2021. As a result of the bonus, they might even be able to increase them if they reach more than 30% share of ZEVs in their sales. In that case there is a 30% cost-effective reduction potential for conventional vehicles, which is not utilised. As a result, if the current zero-emissions target is met, the remaining 70% sales of conventional vehicles do not have to undertake any further improvements, compared to their current technology, even though there is a cost-effective potential for 30% additional reduction of GHG emissions from vehicles with internal combustion power-trains. This results in a wasted potential both from a CO₂ -emissions and a societal and end-user cost perspective. On the other hand, if manufacturers simply do not sell ZEVs, because they can meet the targets by making conventional vehicles more efficient, they will not be utilising the cost-effective

potential that is present in the field of ZEVs. This would further delay the point where ZEVs become cost-effective compared to conventional cars.

Several options are available for solving this. One would be adding a cap on the bonus of the ZEV proposal. However, this will only have a relatively small impact in reaching the overall targets. The preferred option is setting a CO₂ emissions reduction target that requires the full potential of conventional vehicles in addition to a significant share of ZEVs.

As far as the target definition is concerned, it is understandable why the Commission have proposed a target relative to the 2021 WLTP value. This is due to the fact that it is currently not known what the future WLTP/NEDC ratio will be. Therefore, setting a fixed target of grams per kilometre becomes difficult, since the reference point is still not known. Looking at the current WLTP legislation, however, it is clear that it contains options for manufacturers to inflate WLTP numbers. They can give their vehicles a higher declared CO₂ value than the measured value. Since there is no ceiling target level for this inflation, manufacturers can increase the value without limitation. Even if such a target would be introduced, the WLTP procedure allows for further flexibility e.g. by technology choices by manufactures and by utilising flexibilities in the test procedure. This also allows for numbers to be further inflated. An inflated 2021 WLTP average undermines the stringency of the targets proposed for 2025 and 2030.

A solution might be the proposal of a fixed 2025 target and an indicative target for 2030. It could be argued that setting a 2025 target could be acceptable as long as there is an option allowing to correct for the errors made in implementing the 2030 target. That would mean that the 2030 target would be proposed now as an indicative value only and not as a fixed value. It could then be reviewed and adjusted later on, considering improved insights in the development of WLTP values. In addition, further independent testing of vehicles using both the WLTP and NEDC tests could be used to deliver a consolidated value.

In summary, according to Mr. Smokers, the main fix for what is wrong with the current proposal is the introduction of a much stricter overall CO₂ emissions target in order to comply with the COP21 Paris agreement levels, as well as utilising the full cost-effective technical and societal potential.

7. QUESTIONS AND ANSWERS

Ms. Rebecca Harms addressed the disappointment that the Group of the Greens had with the proposal. She presented the results of a study conducted for them which shows that in order to reach the COP21 Paris agreement levels, the emissions reduction target should be set around 75%. The gap between the proposal and the target suggested by the experts is huge and in each round of negotiations aiming at addressing this issue, it has been growing instead of decreasing. She asked the speakers what is causing the problem, since the technology already exists. The European Commissioner involved in the proposal has suggested that job losses in car manufacturing could be a major issue if additional measures were to be introduced leading to further deindustrialisation in Europe.

Mr. Ismail Ertug, from the S&D Group, expressed his concerns that after he addressed car manufacturers they have suggested that the 2025 targets are set for too short a time-frame, in relation to the length of the product development cycles. As a result, the 15% target for 2025 is impossible to reach. In this respect, Mr. Ertug demanded further clarification on the feasibility of the medium-term targets.

Ms. Dalli in her role as chair asked several questions to each of the speakers. She asked Mr. Mock to further elaborate on the societal benefits and clarify why there was such a gap between the assumptions of ICCT and the Commission's proposal. Further to that, she wanted to know the real-world emissions gap from the government, consumer, manufacturers and societal perspective. She wanted to know from Mr. Kasten the time-scale by when electric vehicle technology would become a cost-competitive technology option for consumers and car manufacturers. Her questions for Mr. Smokers were focused on the ultimate level of the targets needed since, in his opinion, they have to be more stringent. Her final question was related to the utility parameter and whether it incentivises manufacturers to produce heavier vehicles in 2025.

Mr. Mock began by confirming that the calculations done by his team are similar to the ones conducted by the German Federal Environmental Agency and indicate a target of 60% to 70%. According to him, this has been the result of back casting in climate targets. Currently, the main issue faced in the sector is the lack of adequate infrastructure and incentives for the final consumer. These hurdles however do not explain the gaps that exist. Regarding the 2025 target, the proposal would translate into a target level of 81 gCO₂/km in the NEDC test procedure. According to Mr. Mock, such a value is not so difficult to reach, even without massive electrification. Further hybridisation and light weighting could also

contribute in reaching those levels. The 2025 target is indeed important in order to provide planning security for manufactures and allow them to understand their investment needs. For the next question, he emphasised that the societal net-benefits are taken directly from the Commission's Impact Assessment. The biggest one is the cost savings consumers get from paying less for fuel because CO₂ emissions and fuel consumption are directly linked. There is also an indirect benefit for society, since the money spent on importing fuel will be instead spent inside Europe. On top of this, not emitting CO₂ would allow for the EU to spend the money currently spent on dealing with the negative externalities of GHG gases elsewhere. Health-benefits from reducing air pollution would also be present. The only change carried out was the assumption for the vehicle technology investments. The calculations in the Impact Assessment are very sensitive, however, even taking into account these figures, the net-benefit for society still exists. Beyond that, even a small change in technology can lead to big benefits for society. In general, the further CO₂ is reduced, the greater the overall societal net-benefit is. As far as the gap is concerned, Mr. Mock emphasised the fact that the biggest problem with the current legislation is that it has not delivered on the targets it set. This is the biggest challenge for the new legislation. According to Mr. Mock it has to be ensured that whatever the new target is it will be followed up on and reached. A practical solution would be to monitor the real-world gap using fuel consumption meters in order to make sure that the gap does not increase in the future.

Mr. Kasten agreed on the remarks made by the speakers and focused on the question of electrification and EVs. According to him the targets set by the EU, US or China are the main driving force behind the time-scale of EVs coming to the market. The certainty of the market growth is also extremely important since the data is going to be used to plan the needs for building charging infrastructure. A binding mandate of EVs could be one solution to achieving this certainty and set the volumes expected to enter the market. Combining this, as a baseline, together with higher CO₂ emissions targets could give manufacturers both the incentive and flexibility they need for their future investment plans.

Mr. Smokers began by stating that the 15% target for 2025 would be too conservative. Out of the CO₂ improvements observed until now only 1/3 to 1/2 are the result of deploying technologies that make cars more efficient. The rest is done by exploiting test flexibilities. This means that the 95 gCO₂/km target for 2021 will be reached without using the full technological potential that is already concluded to be cost-effective and socially beneficial by 2021. In this regard, the 15% reduction target for 2025 means that manufacturers would be required to implement technologies that should have been implemented to meet the 95 gCO₂/km target, without utilising test flexibilities. According to Mr. Smokers, they would be rewarded for utilising flexibilities and postponing the development and

implementation of technologies. If they had complied with the legislation in the spirit of the law, instead of the letter of the law, they would have already had these technologies in place. The fact that they did not, means that they focused on test flexibilities to reach their goals. Looking from this perspective, the 2025 target demands the industry do what they should have done by 2021. As far as the jobs in the car industry are concerned, Mr. Smokers stated that several studies on job competitiveness of the current regulation show that cars have become more expensive to produce, but this is not due to capital or labour cost increases. In fact, this is backed by lower fuel costs and as such is good for GDP and for the economy. The competitiveness of the car industry depends on the cost-effectiveness through which both foreign and European car manufacturers can produce the cars demanded in the European market. Combining the fact that European car manufacturers are dominant in the EU market more stringent legislation could result in European manufacturers becoming more cost-effective in their production cycles. In this sense, being a frontrunner in CO₂ targets makes the European car manufacturing industry more competitive in the EU market. According to Mr. Smokers, the optimal target is undoubtedly the result of a political compromise, but it needs to be at least doubled, to around 60%, compared to what is currently proposed. As far as the utility parameter is concerned, the discussion regarding mass versus footprint is an ongoing one. It was the industry that initially proposed the mass parameter. There is a correction mechanism in the legislation that allows for the Commission to adjust the M0 value in the target function if there is a trend in the market towards higher or lower mass. In this respect, in principle, if all manufacturers begin selling lighter cars, in the short term they will be penalised by stricter targets. In the long term however, if M0 is corrected then that would set back the overall value and they would not lose their competitive advantage. There is also a sort of "prisoners dilemma" embedded in this principle because the first manufacturers will get the penalty of a lower target and if others do not follow they only get part of it back once the M0 is corrected. EVs are also heavier than conventional vehicles and if a manufacturer sells more EVs they get a higher target. According to Mr. Smokers, this also does not make sense. In this respect footprint would be preferred as utility parameter but the question of the necessity to switch to such a parameter is still missing from the current proposal. Mr. Smokers further elaborated on the use by the Commission of a utility-based target function with mass as utility parameter. The slope of the function decreases with more stringent targets and in the end if the slope gets flat there is effectively no differentiation and all manufacturers get similar targets. This means that in the end the mass-based system disappears. Mr. Smokers concluded that the final goal of manufactures should be reducing CO₂ emissions, not selling heavy cars.

A second round of questions followed, where Ms. Dalli opened the floor to external participants in the workshop. A member of the European Parliamentary Research Service raised a question on whether it is useful to invest in manufacturing of conventional cars or should the industry be incentivised to switch entirely to EVs? He further inquired whether it would be appropriate to invest in EV manufacturers only. He posed another question on the appropriateness of replacing conventional cars by electric bicycles and tricycles. The final question he raised was on the effectiveness of subsidising EVs instead of offering free public transport.

Mr. Andrea Gerini, from the Natural Gas Vehicle Association Europe, raised a question on the potential overestimation of the impact of the plug-in hybrids. According to him, plug-in electric vehicles drive less on electricity than in the type approval test which leads to higher CO₂ emissions.

Mr. Greg Archer from Transport and Environment was interested in the opinion of the speaker's panel on the cost-estimates provided by the European Commission and whether after the introduction of legislation they tend to get more expensive or cheaper.

Mr. Benjamin Krieger from the European Association of Automotive Suppliers had a question on the energy chains associated with using and producing electric cars. According to him, tailpipe emissions are currently measured as a reference point for reducing CO₂ emissions, however the entire chain of energy and vehicle production should also be taken in to consideration. He further asked if carbon fuel energy performance should not be considered when discussing emissions reduction legislation.

Mr. Smokers began by answering that it is important to move quickly towards electric vehicles. The speed with which emissions are reduced also becomes more and more important in view of reaching the COP21 Paris Agreement targets on time. Even though the share of EVs will increase, conventional vehicles will still be present for a significant time and in this respect all cost-effective measures should also be taken to make ICEVs more fuel efficient. According to him, a way of promoting ZEVs is by making ZEV or CO₂ credits tradable between manufacturers. This would allow industry laggards to buy credits from electric-only manufacturers and would reward the electric leaders. As far as the public transport option is concerned, Mr. Smokers reminded the audience, that if the White Paper target of 60% for 2050 is increased to 95%, to be in accordance with the Paris agreement, then these options would indeed become highly valuable for meeting the targets. On the other hand, the majority of the trips would still

be done by cars so the implications of such a measure should not be exaggerated. The plug-in hybrid problem could be addressed by setting more stringent targets. Amongst the scenarios analysed for reaching the targets the one with a major share of plug-in hybrids is indeed the most expensive one. In that respect, if the target is strict enough, manufacturers will see that ZEVs are the most cost-effective option. In general, actual ex-post costs turn out to be lower than estimated before the implementation of the legislation. On the life-cycle assessment, Mr. Smokers stated that the energy needed to produce batteries is in fact an important factor, but it should not be included in the legislation because requiring life-cycle assessments would not be feasible in the short term. If on the other hand well-to-tank or life cycle emissions would be included, then the incentive of a given target level for selling zero-emissions vehicles would be reduced. Mr. Smokers concluded that the most important question for this legislation is whether it will promote the uptake of ZEV and to this end the tank-to-wheel approach is most appropriate.

Mr. Kasten focused on the public transport efficiency question. According to him, efforts in both public and private transport are needed to reach the levels of agreed emissions targets. With the current test procedure, the contribution of plug-in hybrids to reducing CO₂ emissions are being overestimated. However, with the changes being introduced the real-world gap would diminish. He emphasised that the stricter the targets are, the less important the plug-in hybrids become. On the tailpipe emissions, he stated that all depends on whether the main goal of the legislation is to incentivise electric driving or not. Currently that is the case, but there is a problem of including the energy side of electric driving in the regulation. Currently the fuel market is a global one, whereas electricity markets still tend to remain in national borders. In this respect it would be extremely difficult to set up a regulation required to address this situation.

Mr. Vanherle reminded the audience that 76% of CO₂ emissions come from cars and vans and it would therefore not be realistic to shift all those passengers to public transport or bicycles. He further emphasised that the energy sector is also an ETS sector which falls under specific regulations and in that respect well-to-tank emissions from using electric vehicles are already regulated. In terms of the cost of CO₂ reduction, he pointed out that the first Impact Assessment suggested that CO₂ emissions reduction results in an increase of societal costs. Nowadays the cost curves are much lower and suggest that post-2020 legislation leads to a reduction in societal costs. He concluded that it is also important to note that the costs are not necessarily reflected in the price of cars.

Mr. Mock further elaborated that cost estimate studies have demonstrated that the estimates in technology costs tend to be much more conservative than the real-world costs. The work done by ICCT has relied on a bottom-up approach of cost estimation to avoid taking data directly from industry and thus ensure a more independent and rigorous analysis. He further emphasised that the Commission estimates have improved over the last years, even though the numbers in the Impact Assessments have been changed. The issue that has not been touched on is that the estimates were made under the assumption that the market remains constant and the various segments do not shift (e.g. SUV share does not increase). According to him, this approach differs from the forecasts made by manufacturers, which consider the potential rise of certain sectors. He further emphasised that the aim of this legislation is to reduce CO₂ emissions and for that reason the market evolution was not taken into consideration. His final point was that the main issue in the sector is not the access to technology or cost-effectiveness, but rather the reduction of GHG emissions.

Mr. Hill concluded the sessions by expressing his opinion that the overall mode of transportation has to be addressed with comprehensive measures instead of tackling a single aspect with a single piece of legislation. Additional measures tackling the energy side of the transport sector should also be discussed with greater ambition. In this respect, in his opinion, a holistic life-cycle approach for vehicles is needed in order to encompass the overall cost of emissions produced from cars and vans.

8. AGENDA

WORKSHOP

Post 2020 CO₂ emissions targets for cars and vans: the right level of ambition?

Tuesday, 27 March 2018 from 14:00 to 15:30

European Parliament (Brussels), Room: Altiero Spinelli 1G2

Organised by Policy Department for Economic, Scientific and Quality of Life Policies
at the request of the Committee on Environment, Public Health and Food Safety (ENVI)

Chair: Miriam Dalli, MEP (Rapporteur)

PROGRAMME

14:00 – 14:05

Welcome by the Chair, opening remarks

14:05 – 14:15

The role of light duty vehicles in achieving emissions reductions

Kris Vanherle, Senior Researcher at Transport and Mobility Leuven

14:15-14:25

The proposed post-2020 targets for light duty vehicles

Peter Mock, Director of International Council on Clean Transportation Europe

14:25-14:35

Increasingly efficient light duty vehicles

Nikolas Hill, Ricardo Energy & Environment, Principal Consultant and Knowledge Leader in
Transport Technology and Fuels Sustainable Transport Practice Area

14:35-14:45

The way forward: The future of electric vehicles

Peter Kasten, Senior Researcher Consultant OEKO-Institute Resources, Transport Division

14:45-14:55

The way forward: possible steps for further improvement

Richard Smokers, TNO, Sustainable Transport and Logistics

14:55 – 15:30

Q&A with closing remarks by the Chair

9. ANNEX: BIOGRAPHIES OF THE SPEAKERS

9.1. *The role of light duty vehicles in achieving emissions reductions*

Kris Vanherle



- Kris Vanherle is a biochemical engineer and holds a master's degree in environmental sciences. He is a Senior Researcher at Transport & Mobility Leuven focusing on the impact assessment of transport policies.
- He has broad expertise with a particular focus on transport emissions of greenhouse gases and air pollutants and has managed several studies for European national governments on behalf of TML. A key research field in which Kris is active, is the quantification of emissions by various transport modes and the assessment of policy measures on transport emissions. To this end, he developed and managed various emissions models (e.g. EMMOSS, TREMOVE, and MOVEET).
- Kris is regularly involved in impact analyses of various measures to reduce the environmental impact of transport (e.g. eco-taxation, CO₂ standards, subsidies for new green technologies, scrappage schemes, and electric vehicle incentives) using quantitative models.

He is also in charge of TML's in-house modelling assessment tools, keeping them up to date with the latest developments in the market.

Presentation available at:

<http://www.europarl.europa.eu/cmsdata/140810/1.%20Kris%20Vanherle%20-The%20Role%20Of%20Light%20Duty%20Vehicles%20In%20Achieving%20Emissions%20Reductions.pdf>

9.2. *The proposed post-2020 targets for light duty vehicles*

Peter Mock



- Peter Mock is Managing Director of ICCT Europe and divides his time between the ICCT's Berlin and Brussels offices. His main focus is the coordination of ICCT activities in Europe, mostly for the light and heavy-duty vehicles sectors. This includes compiling well-based, credible data on the vehicle market and vehicle technologies, and making this information easily available to a broad audience.

- Prior to joining the ICCT, Peter Mock was staff member of the Daimler Global Environmental Protection department and completed a dissertation assessing future market potentials of different vehicle technologies and fuels at the Institute of Vehicle

Concepts of the German Aerospace Centre (DLR). He holds a diploma degree in Chemistry and Economics (Dipl.-Chem. oec.) from the University of Ulm (Germany) and a doctorate in engineering (Dr.-Ing.) from the University of Stuttgart (Germany). In 2015/16 he was working as IPC-Mercator Research Fellow from Istanbul, Turkey.

Presentation available at:

<http://www.europarl.europa.eu/cmsdata/140811/2.%20Peter%20Mock%20-%20Post-2020%20CO2%20standards%20for%20cars%20and%20vans.pdf>

9.3. Increasingly efficient light duty vehicles

Nikolas Hill



- Nikolas Hill is a Principal Consultant and the Knowledge Leader in Transport Technology and Fuels in Ricardo Energy & Environment's Sustainable Transport practice area, with over 18 years of experience working on transport, energy and climate change issues for UK Government, the European Commission and private sector clients.

- Over the years he has been involved in a wide range of projects exploring potential measures to reduce GHG emissions from transport and their respective roles in the context of over-arching objectives. Much of Nik's work has had a focus on modelling the potential costs and emissions impacts of efficient low carbon technologies and fuels in different transport modes, including a number of pioneering UK and European projects.

A significant number of these, particularly in the last few years, have involved the assessment of electric vehicles and their charging infrastructure. Most recently Nik has led key projects for the Commission including work developing new CO₂ reduction cost curves for light-duty vehicles, and the work assessing the impacts of selected options for regulating CO₂ emissions from new passenger cars and vans after 2020 that fed into the Commission's impact assessment for the post-2020 CO₂ regulation proposals launched in November 2017.

Presentation available at:

<http://www.europarl.europa.eu/cmsdata/140812/3.%20Nikolas%20Hill%20-%20Increasingly%20efficient%20light%20duty%20vehicles.pdf>

9.4. *The way forward: The future of electric vehicles*

Peter Kasten



- Peter Kasten is a senior researcher and consultant in the OEKO-Institute's Resources and Transport division. He has worked extensively on electric vehicle market deployment and the interactions between the transport and the electricity sector. He has developed and applied market deployment models and has analysed mobility and vehicle data as well as empirical data on the perception of electric vehicles. Additionally, Peter Kasten has investigated real-world challenges of EV market roll out in several scientific accompanying research projects.

- Since 2013, his research and consulting activities also focus on the analysis of electricity-based synthetic fuels. Currently, he is leading OEKO Institute's work on the interactions between the transport and the electricity sector and is advising the German Ministry of the Environment

on light-duty vehicle CO₂ emissions targets.

- Peter Kasten has joined OEKO-Institute in 2010. Previously, he was employed as a research associate at the laboratory for thermodynamics in new technologies at ETH Zurich. He holds a diploma in energy and process engineering from TU Berlin.

Presentation available at:

<http://www.europarl.europa.eu/cmsdata/140813/4.%20Peter-Kasten-The%20way%20forward%20electric%20vehicles%20neu.pdf>

9.5. *The way forward: possible steps for further improvement*

Richard Smokers



• Richard Smokers (22/09/1964) holds a PhD in experimental physics. Since 1992 he has built an extensive track record in technology assessment and policy-oriented studies in the field of transport, energy and environment. Richard's experience includes the development of test procedures for vehicles with alternative powertrains, monitoring of field trials / pilots with electric and hybrid vehicles, technical and economic assessment of emissions abatement technologies and of alternative powertrains (electric, hybrid and fuel cell vehicles), and environmental and economic impact assessments. He also has extensive expertise on the (measurement and modelling of) real-world emissions and energy consumption of conventional vehicles.

- From 2005 onwards, Richard Smokers has worked as a consultant for the European Commission in a consecutive series of projects assessing options for and impacts of regulation of the CO₂ emissions of passenger cars, light commercial vehicles, and more recently also heavy-duty vehicles.
- During his entire career Richard Smokers has worked in interdisciplinary projects combining knowledge on vehicle and propulsion system technologies with traffic and mobility research, air quality modelling and transition and innovation theory, applying this knowledge for design and evaluation of strategies and policy instruments for sustainable mobility. Over the last years Richard has expanded his field of work to include the wider aspects of sustainable logistics, including activities to promote the development and application of carbon foot-printing method

Presentation available at:

<http://www.europarl.europa.eu/cmsdata/140815/5.%20Richard%20Smokers%20LD%20CO2%20standards%20Thee%20way%20forward.pdf>

Abstract

This report summarises the presentations and discussions of the workshop on “Post 2020 CO2 emissions targets for cars and vans: the right level of ambition?” which was organised for the ENVI Committee and held on 27th March 2018.

The presentations highlighted the role of light duty vehicles in achieving emissions reductions, the proposed post-2020 targets and the increase in their efficiency, as well as the way forward for electric vehicles and the possible steps for further improvement.

The workshop and this report have been commissioned by Policy Department A at the request of the Committee on Environment, Public Health and Food Safety (ENVI) at the European Parliament.

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