

GEAR 2030 Working Group 1 Project Team 2 – 'Zero emission vehicles'

DRAFT RECOMMENDATIONS

Introduction

The EU Member States have committed to reducing greenhouse gas emissions by 80-95% by 2050 with an intermediate target for 2030 of 40% and a reduction in the non-ETS sectors (including transport) of on average 30%. To achieve these goals a comprehensive approach to transport decarbonisation will be required including: improving the efficiency of new cars and optimising use of road space; a switch to lower carbon alternative liquid and gaseous fuels; encouraging modal shift to low and no carbon alternatives; and reducing demand for mobility and freight.

Within the integrated approach to reach the EU objectives of CO₂ emission reductions, low emission traditional and alternative powertrains and fuels will have a major role in contributing to reach the target (it is anticipated that internal combustion engine equipped vehicles including non-plug-in hybrids will still represent a majority of the new registrations in 2030). At the same time, however, it is also essential, and considered by most to be inevitable, that by 2030 the EU has made a significant shift towards zero emission (e.g. battery electric and fuel cell) tail-pipe vehicles including those with significant zero-emissions capabilities (e.g., plug-in hybrid models). For simplicity, these two types of zero-emission vehicles will be collectively referred to as ZEVs in this paper.

The ZEVs, and in particular battery electric and fuel cells, will have the most disruptive effect on the value chain and the biggest impact on the long term competitiveness of the European automotive industry. Therefore, they are in the focus of this paper and the work of the Project Team 2.

The 'Low Emission Mobility Strategy' Communication¹ emphasised the importance of a combination of EU, national and local policies to accelerate use of low and zero-emission vehicles throughout the Union and as far as possible these policies should be designed to be technology neutral. Alternatively powered and fuelled vehicles, and in particular ZEVs, will therefore play even more important role in the transport sector, covering all segments of vehicles (passenger cars, L-category vehicles, vans, HDVs and buses).

ZEVs are increasingly available for cars and L-category vehicles and buses. Light commercial vehicles (vans) are seen as another early adopter market although supply is currently very limited. For trucks, alternative fuels technologies, especially natural and biofuels are being increasingly exploited, however this segment could also be electrified in the post 2030 perspective, possibly using hybrid technologies and catenary systems.

The change in market uptake for ZEVs will be driven by the falling price and improving performance of cells and manufacturing efficiencies for vehicles and battery packs reducing costs whilst conventional vehicles become more expensive through the need for

¹ <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1476374593053&uri=CELEX:52016DC0501>

technologies to improve efficiency and reduce pollution. Nevertheless, by 2030 it is likely the new vehicle market will continue to provide a mix of ultra-low-emissions powertrains including conventional engines using traditional and alternative fuels (e.g. second generation biofuels), plug-in hybrids, electric and hydrogen fuel cell vehicles.

Battery electric cars are only zero carbon at the tailpipe with about half their lifecycle emissions in construction (largely embedded carbon in the battery) and half carbon emissions originating from the electricity generation. CO₂ emissions from electricity generation are capped through the Emissions Trading Scheme; and in most EU countries, on a full-lifecycle or well to wheel basis electric cars are already lower carbon than conventional equivalents. New electricity generation is now overwhelmingly renewable (wind and solar) and by 2030, electricity generation is expected to have been substantially decarbonised throughout the Union increasing the net carbon benefits delivered by electric vehicles. Hydrogen fuel cell vehicles will only be lower carbon than conventional equivalents if the hydrogen is produced from zero carbon electricity.

Electrification and electrically chargeable vehicles (battery electric, hydrogen fuel cell and plug-in hybrid vehicles) will play an increasingly important role in propelling future vehicles. Electromobility based on battery electric or fuel cell vehicles also provides zero tailpipe emissions of air pollutants and quiet driving improving urban quality of life and lowering health effects from air pollution. The creation of a significant market for zero-emission mobility and renewable electricity will also reduce oil dependence as well as synergising to provide a flexible storage source and capacity to balance local grids. Entirely renewable transport fuels also offer the potential to decarbonise transport but are only expected to be available in niche quantities by 2030. Whilst electric vehicles reduce oil dependency, increased demand for batteries could cause new dependencies for critical raw materials and rare-earth elements.

Plug-in hybrid vehicles are zero emission capable but will only achieve low emissions if they are both regularly charged and have an adequate range. They are an important transitional technology that is likely to continue in the market until 2030. These vehicles have the benefit of maintaining much of the existing powertrain whilst adding electrified components and therefore create an easier transition for the automotive supply chain. If the price and performance of battery packs continue to improve as forecast, the inclusion of a second powertrain will add cost making it likely that plug-in hybrid vehicles will have a limited role in the long term.

The early market for PHEVs in the Netherlands suggests they were only operated with zero tailpipe emissions around 30% of the time and to deliver significant environmental benefits this must be significantly increased by incentivising drivers to recharge more regularly, increasing the electric range and increasing recharging availability in urban areas. Whilst the Netherlands case-study had mixed outcomes it did however help consumers to experience ZEVs; and encouraged the Netherlands to install a very good and fine grained network of charging infrastructure for zero emission (capable) cars.

From the perspective of the competitiveness of the European automotive value chain, development of a strong market for ZEVs with European manufacturers offering a range of

powertrain solutions for both the European and export market is essential. Battery charged vehicles represent nowadays the leading segment of zero-emission around the world. In order to retain global competitiveness in this area, Europe should create proper framework conditions for zero-emission vehicles and support innovations which push technological frontier in a technology neutral way.

Draft recommendations:

Following draft policy recommendations are in preparation:

1. A single European market that enables zero-emission and zero-emission capable vehicles (ZEVs) to be used EU wide is essential necessitating recharging / refuelling infrastructure along the primary road network and in urban areas throughout Europe. Existing and upcoming investments, both private and public, should, as far as possible, be done in a systematic and coordinated manner to achieve strong synergies and seamless access to recharging points for all users. European Commission and Member States together with cities and industry stakeholders need to establish a common vision. European action is relevant to close strategic parts of the infrastructure network and also cover more remote parts where the business case is weak. Deployment of Alternative Fuels Infrastructures Directive implementation is needed on time, as per the planned legislative timing and also through enhanced cooperation among these Strategic National Plans (SNPs) , facilitated by the Commission. The late and limited response by most Member States to the submission of the SNPs is a significant concern by stakeholders as the deployment of recharging infrastructure is a prerequisite for an accelerated market uptake.
2. The EU should aim to retain its position as a key global early adopter market (number 2 to China) to stimulate the competitiveness of European automotive industry in designing and manufacturing ZEVs. By scaling sales of ZEVs quickly the EU will ensure the development of an industrial production base for these technologies, notably battery pack assembly and cell (including fuel cell) manufacturing. It will also lead to falling prices through economies of scale.
3. The EU fleet CO₂ emission Regulation setting emission targets is recognised as an effective and efficient EU-level action to drive the introduction of both ZEV and other lower carbon vehicles. The policy creates a level-playing-field, ensures a predictable market and stimulates innovation at a reasonable cost to help meet climate goals. The post 2020 continuation of targets is accepted as appropriate and necessary by most stakeholders. Additional measures taken at the European level to stimulate faster and EU-wide uptake of ZEVs should be considered.
4. For the EU to accelerate the transition to zero-emission and zero-emission capable vehicles and secure the economic benefits the roll-out of these technologies the early market will need to be supported by both financial and non-financial

incentives. This should be done to encourage ZEV purchases by both private and fleet customers and as far as possible harmonised throughout EU member states. To this ends it is proposed to revise the guidelines for Member States willing to promote ZEVs and produce tools to achieve better consistency of the measures.

5. Climate, urban air quality and noise benefits of zero-emission capable vehicles are dependent on the vehicle having an effective zero emission range and being regularly charged. Experience from the early market in the Netherlands shows this is not being widely achieved and it will be important that EU, national and local policies incentivise the optimum purchase and use of these vehicles to ensure they deliver required benefits.
6. Urban mobility (public transport as well as other mobility services) should strongly focus on low and ZEVs in order to both increase public awareness of the technologies and also to create a market. Actions in the area of public transport taken by DG MOVE are welcomed. The planned revision of the Clean Vehicle Directive is an opportunity to provide a stronger push for the roll-out of ZEVs within the public procurement framework. In that respect, new alternative supportive measures, for example technology neutral registration quotas for the public authorities for low and zero-emission vehicles can be considered or tackling the issue of the total costs of ownership when talking about natural gas or electric buses purchases. It should be supported by an ambitious revision of the voluntary Green Public Procurement criteria. Support for the move to zero and ultra-low carbon emission of other urban mobility services should be further investigated, as well as supportive measures in the area of public transport (e.g. harmonisation of the charging systems for buses across the EU) and existing COM action (such as guidelines) regarding urban access schemes for vehicles.
7. Consumer acceptance will be key to an accelerated roll-out of zero-emission and zero-emission capable vehicles. Since purchase prices for those vehicles are expected to remain higher than those for conventional technologies there will need to be a focus on the total cost of ownership (TCO) of those vehicles. It would be recommended to perform a robust assessment of TCO of zero-emission and zero-emission capable vehicles, provide consumers with reliable information and consider tools for decreasing the TCO for those vehicles. It will also be essential that there is sufficient supply and choice in the market.
8. Despite growing range of passenger low, zero-emission and zero-emission capable vehicles, supply of vehicle of similar technologies in the light-duty commercial sector is less likely to the respective business model already focusing on cost efficiency. Similar measures like for the passenger cars should be further analysed and their suitability for the segment to be assessed in order to strengthen the supply of those vehicles and to support development of the purposed based low, zero-emission and zero-emission capable light-duty commercial vehicles and quadricycles.

Future Priorities of the group:

The stakeholders of the Project Team 2 agreed on three priority areas for future discussions:

1. To identify possible legislative measures to promote ZEVs (including CVD, fleet average CO2 targets and mandates, infrastructure, facilitating access to recharging points; and providing consistent consumer information through vehicle labelling)
2. To increasing harmonisation of ZEV fiscal incentives throughout the EU by updating Commission Tax Guidance
3. To develop mechanisms to encourage supply and demand for ZEV urban delivery using vans and light electric freight delivery vehicles