EUCAR Perspective on

Future Sustainable Propulsion

Key Statements for Sustainable Propulsion

EUCAR is committed to supporting the targets of the 2015 Paris climate change conference, COP 21. ➔ Our highest priority is to mitigate the impacts of climate change by reducing greenhouse gas emissions.

EUCAR is committed to developing and providing sustainable powertrain technologies that contribute to an enhanced quality of life of the EU citizens. ➔ We reduce direct and indirect pollutant emissions *from road transport, starting with urban areas.*

EUCAR strives to develop powertrain technologies that will advance the technological competitiveness of the European automotive industry and maintain its position as a significant employer in the EU. ➔ We develop cutting-edge technologies which fulfil the regulatory requirements and our customers' demands, while guaranteeing long-term competitiveness.

Our powertrains will increasingly turn towards low/zero emissions. The diversified powertrain portfolio of 2030 will lead to a significant reduction of greenhouse gas emissions in agreement with the targets of the Paris climate change conference.

- The 2030 powertrain portfolio will be more diversified than today, comprising advanced ICEs (gasoline, diesel, Natural Gas), HEVs, PHEVs, and BEVs. This composition of different powertrains will be gradually complemented by FCEVs.
- Customers' decisions for a specific passenger car powertrain variant will be based on their individual needs and preferences concerning their usage patterns, e.g. urban commute vs. long distance travel.
- We actively work on reaching cost competitiveness of novel powertrains to promote the development towards zero emission transport.

Passenger cars, distribution trucks and buses in urban areas will achieve zero emissions.

- The automotive industry is developing the technologies to realise zero emission urban transport, i.e. BEVs, PHEVs, and FCEVs. For this we need to both increase battery capacities and reduce the overall powertrain costs. Smart vehicle technologies are important for HEV, PHEV, REX to provide evidence of "zero emission" capability before entering the inner city (e.g. charging state of the battery).
- However, the availability of alternative-fuels infrastructure needs to increase dramatically. Therefore major investments in public (fast) charging infrastructure are necessary. Additionally, every customer has to be able to charge at home and/or at work. At these locations low-power charging is effective due to long idle times.
- From a technical point of view, this includes an extensive roll-out of charging points accompanied by upgrades to the nearby low voltage electricity grid connections, wherever necessary.

In addition, the development of an adequate and effective regulatory framework, the introduction of uniform standards, and the promotion of further incentive measures will be required.

Long-distance travels with passenger cars and long-haul commercial vehicles will primarily be dominated by PHEVs, HEVs, and advanced ICE propelled vehicles. Due to existing challenges, BEVs only represent a complementary long-distance option.

- The dominating powertrain technologies for 2030 long-distance vehicles are PHEVs, hybrids, and advanced ICE vehicles due to their high driving range. FCEVs fuelled with green hydrogen will be added to the long-distance powertrain options.
- BEVs will complement long distance vehicle transport combined with an appropriate roll-out of fast charging infrastructure. This limitation is mainly related to high battery costs and the required high investments for a large number of peak load capable fast charging stations to cope with high demand situations.
- Besides the roll-out of fast charging stations, further H2 refuelling stations will be necessary with an increasing number of FCEVs.
- Chemical energy carriers, primarily liquid fuels, will remain relevant for road transport in 2030 due to their high energy density. These fuels need to become increasingly sustainable, e.g. by introducing synthetic fuels produced from renewable electricity.

The internal combustion engine as a core component of PHEVs, HEVs, and advanced ICE vehicles maintains its relevance within a long-term perspective.

- In future with advanced internal combustion engines, we will have negligible pollutant emissions e.g. NOx.
- Besides BEVs and FCEVs, PHEVs represent suitable ICE-equipped vehicle concepts for those urban areas with access restrictions. Zero emissions can be achieved in electric mode within city limits, while ICE can still be used elsewhere.
- Sustainable alternative fuels produced from renewable sources bear the potential for a further reduction of greenhouse gas emissions in a well-to-wheel frame. CNG / SNG could also reduce direct vehicle greenhouse gas emissions towards 2030.

All types of sustainable propulsion will be required to use renewable electricity as their primary energy carrier.

- The primary application of green (renewable) energy within road transport is for charging BEVs and PHEVs. Vehicle grid integration must be considered by all actors.
- The surplus of generated renewable electricity can be converted into hydrogen for storage and propulsion in FCEVs. Generating synthetic fuels will allow green electricity to be used in ICE powertrains, while benefitting from existing energy/fuel infrastructures.
- The economic competitiveness of synthetic fuels generated from renewable energy sources will depend on CO2 emission pricing (for non-renewable energy carriers) or other incentives.
- Biofuels should complement the use of renewable fuels to some extent, if strict and verifiable sustainability criteria are being applied e.g. no monocultures and no conflict with food and feed crop cultivation.