

# Euro 7: An Opportunity to Significantly Reduce Evaporative Emissions from Internal Combustion Engine Vehicles



## The European Green Deal will provide better air quality with the right approach

In line with current European efforts to improve air quality, all vehicles should be contributing to emission reductions.

Considering combustion engine vehicles utilizing fossil and renewable fuels will continue to play an essential role in transportation for at least 20 years, emissions must be minimized to near zero levels, and the fuel must be used as efficiently as possible.

Commercially available and cost-effective control technologies for evaporative emissions have not yet been implemented by European policies. Euro 7 should change that.

**Incorporating proven evaporative control technologies aligns with the zero-pollution ambition of the Green Deal to reduce emissions and improve air quality in European cities.**





## Enhancing the control of evaporative emissions for better air quality in the EU and in the world

All ICE-containing vehicles can and should be brought closer to zero emissions in a cost-effective manner to contribute to the emission reductions needed for air quality improvements. Existing technologies, such as on-board refueling vapor recovery (ORVR) and on-board diagnostics (OBD) are commercially available and economically feasible solutions that should be required for all ICE-containing vehicles.

### ORVR for achieving near zero evaporative refueling emissions

- ORVR is a commercially available and fully developed technology which allows to significantly reduce evaporative emissions, also known as non-methane volatile organic compounds (NMVOC), by 98%.
- If ORVR is implemented in Euro 7, this would equate to 110,000 tonnes of NMVOC reduced compared to uncontrolled emissions and up to 50,000 additional tonnes of NMVOC reduced compared to current Stage II systems.
- Therefore, ORVR will help the 18 Member States plus the UK who are not expected to meet their NMVOC commitment for the 2030 National Emissions Ceiling Directive.

	STAGE II	ORVR
<b>Certification efficiency</b>	85%	98%
<b>Average typical real-world efficiency</b>	50%-60%	97%-98%
<b>Maintenance required</b>	Replace every 8-10 years	None
<b>Control device location</b>	Fuel dispenser	Vehicle
<b>Captured emissions</b>	Sent to underground storage tank which must be controlled	Recirculated to engine to be combusted as fuel
<b>Costs</b>	€1,200 - 1,600 per dispenser annually*	€10 - 20 / vehicle for lifetime**
<b>Additional MECA resources</b>	 <a href="#">Link Here</a>	 <a href="#">Link Here</a>

\*Based on European Commission Impact Analysis and Evaluation for Stage II useful life of 8-10 years

\*\*MECA estimate based on incremental component costs relative to Euro6d canister

### Lower limits and OBD allow for additional control of evaporative emissions

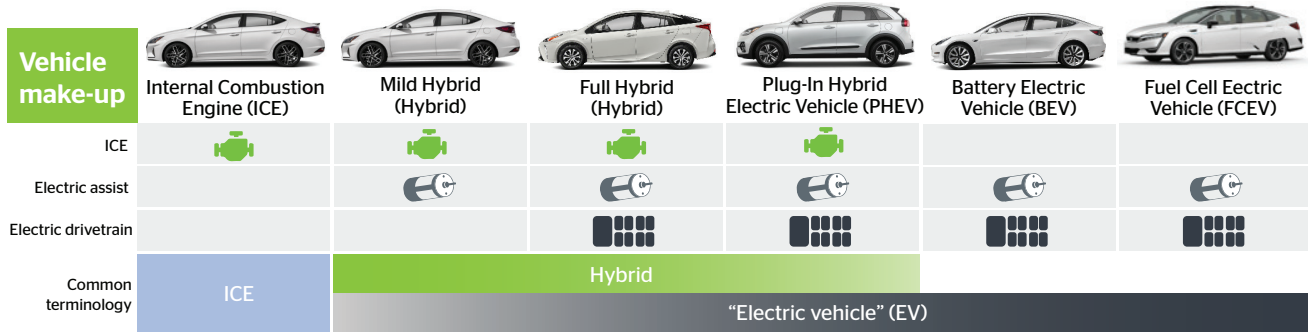
- Establishing more stringent evaporative emission limits of 0.30 g/day will encourage use of available near zero evaporative control technologies, including fuel vapor permeation controls.
- OBD for evaporative leak detection is existing and proven technology that will allow for the identification of high-emitting vehicles for the full life of all vehicles equipped with this technology.



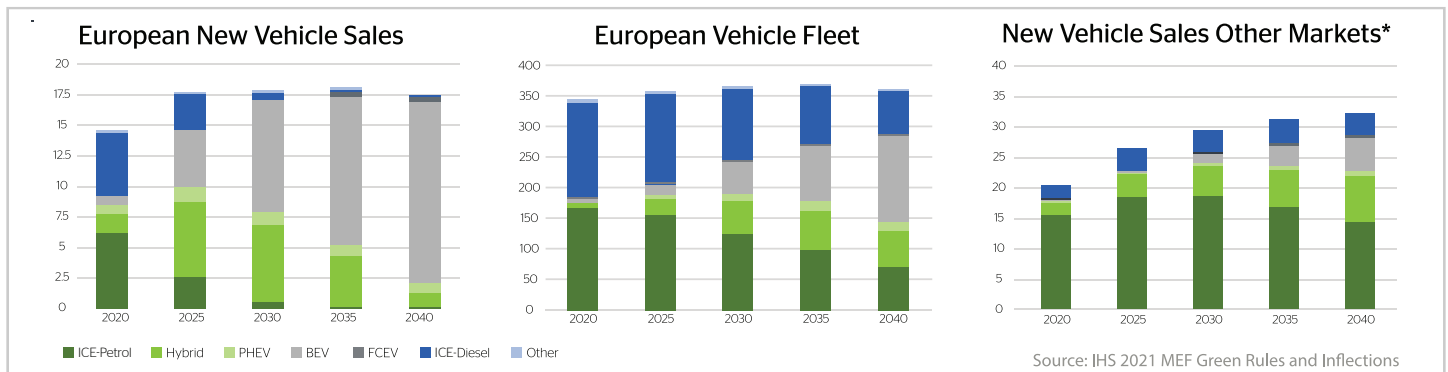
# Strengthening vehicle evaporative emission standards to ensure the transition of all vehicles to low emissions in the long term

Although the production and integration of battery electric vehicles (BEV) and fuel cell electric vehicles (FCEV) are now a priority, any new ICE-containing vehicles sold in the transition (including PHEVs) will remain on the road for at least 10 years. Therefore, European standards relating to the control of evaporative NMVOC emissions, responsible for ozone and secondary PM2.5 emissions, need to be strengthened to ensure optimum control and improve air quality.

## ICE-containing vehicles will continue to make up a majority of on-road vehicles through 2040



## European and global new vehicles sales and fleet forecasts (in millions)



\*Other markets indicate the countries and regions that will likely adopt the Euro 7 evaporative emission standards. This includes new vehicle sales globally, except for China, US, India, and Europe.

## Volatile Organic Compounds (VOC) are a direct contributor to ground level ozone and secondary PM2.5, which can be mitigated

- Europe is expected to sell 88 million ICE-containing vehicles between Euro 7 implementation in 2025 and the proposed 2035 date for only zero emission vehicle (ZEV) sales.
- ICE-containing vehicles generate both exhaust and evaporative emissions. While existing transport policies have focused heavily on reducing exhaust emissions (i.e. NOx and direct PM2.5), additional emphasis on reductions of evaporative emissions (i.e. NMVOC) are necessary to reduce ozone and secondary PM2.5 in urban cities.
- Refueling NMVOC emissions are regulated at the EU level under Stage II regulation; however, the efficiency of Stage II is not optimal and declines significantly without proper inspection and maintenance, and the installation of Stage II has not been completed at many petrol refueling stations across the EU. NMVOC emissions continue to persist even though there are suitable solutions, such as ORVR, to control them much more efficiently.
- Therefore, a more efficient system is needed to address evaporative emissions, improve air quality, and meet climate objectives.

## Europe has the opportunity to lead improved air quality for the rest of the world

Finally, European regulations are adopted by other nations voluntarily, through United Nations Economic Commission for Europe (UNECE) agreements, and by automakers who sell vehicles into global markets that currently have no regulations for refueling control.

- Countries with near-zero evaporative policies including ORVR, OBD, and Enhanced Permeation Control
- EU-27 and UK adopting Euro 7
- Other countries likely to adopt Euro 7

