



Euro 7: Stricter limits for evaporative and refueling emissions must be safeguarded to improve European air quality

MECA welcomes stricter limits for non-exhaust emissions for internal-combustion engine (ICE) vehicles

The European Commission's Euro 7 proposal will be essential to reduce non-exhaust evaporative emissions of non-methane volatile organic compounds (NMVOC) from ICE vehicles that will be on the road until at least 2050.

The Euro 7 proposals for non-exhaust evaporative and refueling emissions should be safeguarded **and implemented no later than July 2025 for M1 and N1 vehicles** to ensure all new vehicles introduced into the European market contribute to improving air quality. These proposals include:

- Introducing a **refueling emissions limit of 0.05 g/L of fuel**¹.
 - This limit can be met with existing, cost-effective technology, including **on-board refueling vapor recovery (ORVR)** systems already adopted in the U.S., Canada, China and Brazil markets².
- Establishing a **more stringent evaporative emission limit of 0.50 g/day**¹.
 - This limit should be safeguarded as the bare minimum to achieve existing best available control technologies. MECA believes European citizens would benefit from a more ambitious 0.30 g/day limit as adopted in the U.S. market³.

Benefits of safeguarding Euro 7 proposals for non-exhaust evaporative and refueling emissions include:

- Aligning with the **zero-pollution ambition** set forth in the European Green Deal^{4,5} to deliver better air quality for EU citizens;
- Enabling **significant reductions in NMVOC** to reduce ozone and PM_{2.5} air quality exceedances and contribute to Member States' NMVOC National Emission Reduction Commitments;
- **Reducing potential of harmful benzene exposure** (a known carcinogen) during self-serve or full-serve refueling events⁶.
- Allowing the European Union to set **harmonized global standards** for near-zero evaporative controls, leading to cost savings through economies of scale and streamlining of certification for the industry.

¹ COM(2022) 586 - Annex 1, Table 3 'Euro 7 evaporative emission limits for petrol fuelled M1, N1 vehicles' (p.4)

² COM(2022) 586 - Recital (11) (p.18)

³ A 0.30 g/day limit was included in the recommendations of the CLOVE consortium and assessed by the Commission in the Euro 7 impact assessment.

⁴ COM 2019/640 Communication and roadmap on the European Green Deal, 11 December 2019

⁵ COM 2021/400 Communication on EU Action Plan: "Towards Zero Pollution for Air, Water and Soil" and annexes, 12 May 2021

⁶ Petrol in the EU contains up to 1% benzene by volume and benzene vapor is found in refueling emissions. The demonstrated superior in-use efficiency of ORVR as compared to Stage II vapor recovery will reduce potential benzene vapor exposures by as much as 150 mg per 40 L refueling event. ([Link](#))

Air quality will benefit from stricter limits for evaporative and refueling emissions

The **Euro 7 proposal includes increased limits for evaporative and refueling emissions** thanks to **feasible and affordable mitigating technologies**. These stricter limits are essential to tackle harmful pollutants such as Non-Methane Volatile Organic Compounds (NMVOCs).

It is reported that 71% of NMVOCs result from evaporative emission⁷. Yet, NMVOCs are an important contributor to fine particulate matter (PM_{2.5}), ozone and smog which constitute significant sources of air pollution within the EU. This comes as many EU jurisdictions face an increasing number of air quality exceedances which lead to litigations and substantial fines.

This phenomenon is particularly observed during heatwaves, which year after year, continue to increase in frequency, duration, and intensity. A recent study conducted by researchers of the University of Tennessee shows that **more stringent refueling and evaporative controls in Euro 7 would provide an additional 72% evaporative NMVOC emissions reduction relative to Euro 6d**⁸. It is also worth recalling that NMVOC reductions will support the National Emission Reduction Commitments (NEC) Directive by delivering NMVOC reductions in both the real-world and inventories.

Thus, **MECA calls for maintaining, as bare minimum, the Commission's proposal to limit evaporative emissions to 0.50 g/day for M1 and N1 vehicles, and refueling emissions to 0.05g/L of fuel**¹. Although the 0.50 g/day limit for evaporative emissions is a step forward, the European citizens would benefit from a more ambitious 0.30 g/day limit, like that enforced in other regions of the world. These two targets are also recommended by the scientific CLOVE consortium's latest report, concluding greater air quality improvements for all⁹.



MECA welcomes stricter limits for non-exhaust evaporative and refueling emissions, which will guarantee that the next generation of ICE vehicles aim to achieve near zero emissions.

Current technology illustrates how automotive manufacturers can efficiently reach the Euro 7 limits

Although Europe currently regulates refueling emissions with the Stage II Directive¹⁰, the maximum efficiency required of Stage II technology at certification is only 85% and in-use efficiency can be significantly reduced to 55% without proper inspection and maintenance¹¹. This low efficiency of Stage II is inconsistent with the zero-pollution ambition set forth in the EU Green Deal. Furthermore, petrol in the EU contains up to 1% benzene by volume and benzene vapor is found in refueling emissions. The demonstrated superior in-use efficiency of ORVR as compared to Stage II vapor recovery will significantly reduce potential benzene vapor exposures (a known carcinogen) and therefore improve public health⁶.

With its Euro 7 proposal, the European Commission now acknowledges that **there are technologies available and used widely worldwide that better limit evaporative emissions of VOCs during the use, parking and refueling of**

⁷ 2017 COPERT EEA Inventory Data for EU-28

⁸ Matthew J Tipton et al 2022 Environ. Res. Commun. 4 081003 ([here](#)); note the paper modeled a 0.05 g/L refueling emissions limit and a 0.30 g/day evaporative emission limit. Refer to the Corrigendum of the paper for the revised data presented here.

⁹ Slide 64 of CLOVE presentation to AGVES on 27 October 2020 ([here](#))

¹⁰ Directive 2009/126/EC on Stage II petrol vapor recovery during refueling of motor vehicles at service stations

¹¹ Slide 62 of CLOVE presentation to AGVES on 27 October 2020 notes 55-85% efficiency for Stage II control ([here](#))

a vehicle¹². In the U.S., Canada, China, and Brazil markets, automotive manufacturers have implemented accessible and affordable technologies, such as **On-board Refueling Vapor Recovery (ORVR)**.

The major benefit of ORVR is its two-function canister that will **capture over 98% of the petrol NMVOC vapor from refueling** and thus reduce air pollution. The European Commission evaluates in its impact assessment that the **cost of ORVR amounts to only 16€ per vehicle¹³**. Compatible and complementary to the current EU Stage II vapor control technologies¹⁴, ORVR is a fully developed technology, affordable, and commercially available.

Besides having a relatively low price compared to its environmental and public health benefits, the ORVR system is designed to recover fuel vapors and recycle them into usable fuel, thereby offsetting its already low cost through fuel savings.



ORVR is a well-proven, globally accepted, and low-cost control technology solution for achieving near-zero evaporative refueling emissions

The urgency to improve European air quality calls for an implementation no later than July 2025

Improving air quality is a key priority for EU citizens and existing emission reduction technologies are already used by EU automakers to comply with other regional laws and regulations. As such, considering the automotive industry already implements stricter limits and best available technologies in other regions, **Euro 7 should be implemented in the EU without delays and no later than July 2025.**

In addition, Euro 7 is an opportunity for the EU to rapidly seize its global leadership in environmental policy. Several markets, such as India, Australia, African and South American countries, rely on the EU's standards to base their own emission rules. Harmonization of evaporative standards to the greatest extent possible would lead to air quality improvements worldwide with a cost savings through economies of scale and streamlining of certification for the industry.



Considering the automotive industry already implements stricter limits for evaporative emissions in other regions, Euro 7 should implement in the EU without delays and no later than July 2025.

MECA's recommendations

- > Maintain Euro 7 overall non-exhaust emissions ambitions through stricter limits and best available technologies (*Recital 11*);**
- > Ensure the refueling emissions limit of 0.05 g/L is maintained and that the limit for evaporative emissions is as bare minimum 0.50 g/day to protect and improve EU citizens air quality (*Annex 1, Table 3*);**
- > Cement the implementation of the rules no later than July 2025 to ensure all new vehicles introduced into the European market contribute to improving air quality (*Article 20*).**

¹² COM(2022) 586 - Recital (11) (p.18)

¹³ SWD(2022) 359 (p.61) ([here](#))

¹⁴ MECA Refueling Vapor Recovery Whitepaper, February 2020 ([here](#))