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How challenging will the proposed Euro 7 norms be for the industry to comply with?

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While the Euro 7 proposal introduces brake and tire emissions for the first time to include zero-emission vehicles under its purview, ACEA warns that the proposed emissions mandate risks slowing down the ongoing EV transition

On 9 November 2022, the European Commission presented a proposal to implement Euro 7 emission norms in Europe for new light duty vehicles (cars and vans) from 1 July 2025 and for heavy-duty vehicles (lorries and buses) from 1 July 2027. Succeeding Euro 6 norms, which was implemented in 2014, the Euro 7 mandate is going to be the final set of regulations for the internal combustion engines (ICEs), before new gas-powered cars and vans are phased out from production and sales by 2035 in Europe.

According to the official note released by the Commission, the Euro 7 proposal replaces and simplifies previously separate emission rules for light-duty and heavy-duty vehicles within Euro 6 norms. "The Euro 7 standard rules bring emission limits for all motor vehicles, i.e., cars, vans, buses and lorries under a single set of rules," the Commission said, adding that the new rules are fuel- and technology-neutral, placing the same limits regardless of whether the vehicle uses petrol, diesel, electric drivetrains or alternative fuels.

The Commission estimates that Euro 7 will complement Europe's carbon dioxide (CO2) emission standards well in terms of delivering improved air quality, especially in cities. It is already known that Europe's CO2 emission standards support the European Union's climate ambition of reducing greenhouse gases (GHG) by at least 55% by 2030, compared to 1990, as proposed under the Fit for 55 mandate in 2021.

"The new Euro 7 emission standards will ensure that cars, vans, lorries and buses are much cleaner, in real driving conditions that better reflect the situation in cities where air pollution problems are largest, and for a much longer period than under current (Euro 6) rules," the Commission said, arguably reflecting on the gas-powered vehicle fleet plying on European roads after 2035.

For example, under Euro 6 norms for cars and vans, nitrogen oxides (NOx) emissions have a limit of 60 mg/km for gasoline cars, and 80 mg/km for diesel. That said, under the Euro 7 rules, that limit will be 60 mg/km, irrespective of whether the vehicle is powered by a diesel or a gasoline engine.

Meanwhile, for heavy-duty vehicles such as the lorries, trucks, and buses, the emission limits are set lower than they were in the previous Euro VI heavy-duty standards. According to the Commission, this reflects the untapped potential of existing technologies and the need for further reductions of air pollutant emissions from these vehicles, especially in the freight transport sector, where combustion-powered vehicles are expected to continue being sold until 2035 and beyond.

While all new cars and vans sold in Europe will have zero CO2 emissions, the Commission estimates that in 2050, more than 20% of cars and vans and more than half of the heavier vehicles in our streets are expected to continue to emit pollutants from the tailpipe.

Consequently, the Commission estimates that in 2035, Euro 7 will lower NOx emissions from cars and vans by 35% compared to Euro 6, and by 56% compared to Euro VI from buses and lorries. In addition to that, the newly proposed emission norms will be able to lower particles from the tailpipe by 13% from cars and vans, and 39% from buses and lorries.

In addition to the tailpipe emissions, the Euro 7 proposal also attempts to regulate emissions from

brakes as well as tires from all vehicles categories for the first time. This paves the way to regulate emissions from brakes and microplastics from tires of the plug-in hybrid, battery as well as fuel cell electric vehicles (PHEVs, BEVs and FCEVs). Interestingly, the Commission estimates that the emissions from brakes and tires would soon become a major source of particle emissions from the road transport sector, especially after the tailpipe emissions are fixed. It said that if Euro 7 norms are implemented as proposed, it will be able to reduce emission of particles from the brakes of cars by 27% in 2035.

The Commission said that its Euro 7 proposal will be submitted to the European Parliament and the Council in view of its adoption by the co-legislators.

What pollutants are regulated under Euro 7?

The Euro 6 regime regulates pollutants such as NOx, carbon monoxide (CO), particles, hydrocarbons, methane and ammonia (especially for lorries and buses). While the successive emission norms include all the aforementioned pollutants that are regulated under the Euro 6 norms, it does a lot more. For example, the Euro 7 proposal also extends regulating ammonia emission limits from heavy-duty vehicles to the light-duty vehicles. Notably, ammonia as a pollutant plays a key role in the formation of urban smog. Furthermore, the Euro 7 proposal also regulates formaldehyde, which is an irritant, carcinogenic gases, and nitrous oxide for lorries and buses.

According to the Commission, nitrous oxide is a potent GHG that will be regulated for the first time by Euro standards (under Euro 7 norms). In addition to that, Euro 7 will be the first emission standards worldwide to regulate the smallest of ultrafine particles, down to 10 nanometers, particles from brakes and battery durability.

This means that every Euro 7 compliant vehicle will have to adhere with new emission limits, including for the pollutants that were previously unregulated, along with complying with rigorous tests that are more representative of the real time driving conditions and improved durability requirements.

New vehicle testing norms under Euro 7 proposal

The proposal to implement Euro 7 emission norms will also introduce a significant change in the real-time driving emission (RDE) test mechanism that was earlier defined under the Euro 6 standards. The Commission committee has widened the testing conditions to increase the scope and accuracy of the emission measurements during the lifecycle of the vehicle.

For example, currently, the Euro 6 standard cars have to comply with the emission requirements of only up to 100,000 km or 5 years of use. This is against the average age of cars in Europe, which is close to 12 years. However, with the new rules under the Euro 7 regime, the emission requirements will be stretched up to 200,000 km and 10 years of vehicle use. According to the Commission, this will better reflect the normal lifecycle of vehicles, including second-hand vehicles on Europe's roads.

The aim, clearly, is to ensure that real-time driving emissions of the vehicle stay in the predefined limits as it is driven across the EU. Previously, the Commission had introduced the RDE tests to measure vehicular emissions in real-time driving conditions after Volkswagen's infamous Dieselgate scandal. The RDE tests had eventually increased the market surveillance capabilities of the Member States as well as the Commission to ensure that vehicle emissions are aligned with the Euro 6 norms beyond the testing labs.

Moreover, to achieve prolonged RDE tests under Euro 7, the Commission has proposed that both light-duty as well as the heavy-duty vehicles will need to be equipped with on-board emissions monitoring systems (OBM). With the onboard emission monitoring systems, which will deploy sensors to measure emissions performance, the Euro 7 compliant vehicles will be capable of notifying problems early and significantly contribute to keeping the vehicles clean.

What industry bodies say?

Even as the automakers continue to invest heavily in developing and producing ZEVs, including BEVs and FCEVs, the European Automobile Manufacturer's Association (ACEA) warns that the Euro 7 proposal risks slowing down the ongoing transition. Supporting the existing Euro 6 regime, ACEA argues that EU already has the most comprehensive and stringent emission standards for pollutants such as NOx and PM.

"The auto industry takes its role to reduce both CO2 and pollutant emissions very seriously. Indeed, last year we made a very constructive proposal for a new Euro 7, which would bring a major reduction in criteria pollutants, thus improving air quality," explained Oliver Zipse, ACEA President and CEO of BMW. However, he added, "Unfortunately, the environmental benefit of the Commission's proposal is very limited, whereas it heavily increases the cost of vehicles. It focuses on extreme driving conditions that have hardly any real-life relevance."

The auto manufacturers' lobby also added that the Euro 7 proposal is particularly harsh for heavy-duty vehicles (trucks). "It completely neglects the rapidly accelerating shift to zero-emission vehicles, and also ignores the effect of future CO2 targets for heavy-duty vehicles," ACEA said in its official statement last week, referring to the new proposal.

According to Martin Lundstedt, CEO of Volvo Group and Chairperson of ACEA's Commercial Vehicle Board, to comply with Euro VII, truck makers will have to move substantial engineering and financial resources from BEVs and FCEVs back to the ICE. "This will severely impact our transition to zero-emission vehicles. It is not good for the climate, not good for people's health and not good for the industry. Policy makers should focus on measures that accelerate fleet renewal, prioritizing investments in zero-emission vehicles, which will have a far bigger impact on both air quality and reduced CO2 emissions," he said.

Cautioning on the implementation deadlines, ACEA said that while the Euro 7/VII legislative package will likely not be ready before mid-end 2024 in lieu of the long list of additional tests it covers, the proposed implementation dates (July 2025 for cars and vans and July 2027 for heavy-duty vehicles) are unrealistic, given the huge number of vehicle models and variants that will need to be developed, engineered, tested and approved for the market launch.

"Euro 7/VII therefore risks being very complex and costly," ACEA warned.

ACEA agreed to the Commission's Euro 7 proposal on the emission of particles from brakes and tires of all vehicles, including EVs. It acknowledges that after the tailpipe emissions are duly regulated, the particles from non-exhaust sources such as brake wear and tire abrasion will overtake exhaust particle emissions. The lobby suggested that such emissions (from all vehicles, including electric) should be the focus of both Euro 7/VII and the tire type-approval regulation, once robust new test procedures are ready.

Meanwhile, the European Association of Automotive Suppliers (CLEPA) has expressed concerns about the timing, technical challenges as well as economic feasibility of the Euro 7 proposal. It said that these aspects need to be addressed to ensure the new rules can be implemented and also

apply to realistic driving situations. The suppliers' association stresses on the importance of the lead time needed by industry to develop and validate the new Euro 7 technologies. According to the association, the specific technical parameters for vehicle testing are key factors influencing the overall severity of the new regulation.

"These parameters are not yet known and will come via several implementing and delegated acts, which should be completed as soon as possible to enable a swift implementation of Euro 7," the lobby said, adding that a lead-time of at least 24 months after the finalization of the secondary legislation is necessary for light-duty vehicles. It suggested 36 months of lead-time is needed for the heavy-duty vehicles.

Benjamin Krieger, CLEPA Secretary General, said, "A balanced Euro 7 will encourage innovation and improve air quality, benefiting the environment, consumers, and industry. But it needs to remain realistic as to what is technically achievable with current and near-future technologies. If the advanced internal combustion engine has a role to play in future mobility, its environmental impact has to be further improved. This, alongside controlling emissions from other sources, such as brakes and tires, which are not related to the drivetrain."

S&P Global Mobility's take on Euro 7 proposal

According to Michael Southcott, associate manager, propulsion systems, S&P Global Mobility, "The biggest impact from powertrain perspective is whether you can get through the proposed Euro 7 norms with just an ICE or ICE Stop/Start. There will be some bolt on technology potentially like GPF for MFI engines and potentially eCat for some LCVs, but I suspect some may be able to sneak through without electrification."

Although Southcott views that the given deadline to meet the Euro 7 mandate, if implemented, as a short timeframe, he estimates that meeting the requirements under the proposed norms would not be overly challenging for OEMs. "A recalibration and in some cases a small increase in technology will get them through," he said, adding that the absolute challenge for the OEMs, however, will be homologating all of their vehicles/engines in the given timeframe. "We have seen this before at the time when the Euro 6d norms were implemented and how challenging it was," he said.

In addition, automakers as well as the supply ecosystem is already investing heavily in transitioning to make EVs. While the auto industry is already witnessing the consolidation and formation of new partnerships to steer through the disruptive transition, some may even argue that implementing Euro 7 norms may put excessive financial burden on the suppliers to further invest on combustion engine technologies, which will be phased out in the coming years.

Commenting on whether preparing for Euro 7 norms will require heavy investments, Southcott, added, "Although automakers such as Ford and Stellantis have already expressed their concerns on the implementation of Euro 7 norms by the given deadlines, but I don't think it (new investments) will be overly significant. That said, I guess the argument will be that every penny and second we have should be spent on (the development of) zero emission vehicles and this does take away some R&D/recalibration time."

He further added, "From my perspective, we are about 12 to 13 years away from the ICE ban in Europe. Whilst it would be nice if OEMs always bolted everything they could to their vehicles and engines to make them as clean as they possibly could, we know that's not the case. Where we can bring in sensible, incremental legislation to improve emissions we should. Sub 23nm particles is the obvious one to this point, we know it poses some health risks, we have the equipment to capture these and also measure them, so we should put some legislation in place to try and reduce their

impact."

Meanwhile, giving his perspective on how the Euro 7 norms will impact the thermal suppliers, Suraj Shetty, principal research analyst, thermal, S&P Global Mobility, said, "Euro 7 is not expected to majorly impact the demand for ICE thermal emission components like cooled EGR and charge air cooler. Cooled EGR is standard fitment in European diesel engines anyway, hence the demand is just expected to follow the trajectory of the propulsion demand in the region."

"More larger capacity diesel engines may adopt dual loop (LP+HP) cooled EGR, but overall fitment is still driven by individual OEM technology strategy to meet specific emission targets. EGR fitment in gasoline engines is not expected to be impacted by the updated emission regulations as the NOx reduction in EURO 7 is a challenge specifically for diesel engine but not for gasoline. Japanese and Korean OEMs like Toyota and Hyundai are already proponents of cooled EGR fitment in their gasoline engines in Europe and this is expected to continue."

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