

WRITTEN COMMENTS OF THE MANUFACTURERS OF EMISSION CONTROLS ASSOCIATION ON THE CHINA MINISTRY OF INDUSTRY AND INFORMATION TECHNOLOGY'S PROPOSED AMENDMENT TO FUEL CONSUMPTION LIMITS FOR PASSENGER CARS AND FUEL CONSUMPTION EVALUATION METHODS AND TARGETS FOR PASSENGER CARS

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The Manufacturers of Emission Controls Association (MECA) is pleased to provide comments on the China Ministry of Industry and Information Technology's (MIIT) proposed amendment to the regulation of fuel consumption limits for passenger cars (GB 19578) and fuel consumption evaluation methods and targets for passenger cars (GB 27999) (i.e. China 2025 Phase 5 fuel consumption standards). MECA thanks MIIT for their leadership in developing creative and feasible policies that will incentivize the introduction of more fuel efficient vehicles including efficient internal combustion engines, hybrid electric and all-electric vehicles to help China meet its air quality and energy security goals.

MECA is a non-profit association of the world's leading manufacturers of emission control, combustion efficiency and fuel saving technology for mobile sources. MECA members supply the full complement of electrified and electric vehicle technologies from micro-hybrid start/stop and mild hybrid 48 volt systems, full hybrid and plug-in hybrid architectures to all electric battery and fuel cell components. Our members have over 40 years of experience and a proven track record in developing and manufacturing clean and efficient mobility solutions for a wide variety of on-road and off-road vehicles and equipment, including extensive experience in developing criteria pollutant and GHG reducing emission controls for gasoline and diesel light-duty vehicles in all world markets. Our industry has played an important role in the emissions and efficiency success story associated with light-duty vehicles in North America and has continually supported efforts to develop innovative, technology-forcing, emissions programs to mitigate air quality problems, create jobs and reduce fuel consumption from vehicles.

MECA supports the phasing down of credit multipliers for NEVs from 2 to 1 from 2020/2021 to 2025. The early introductory use of incentives can promote innovative technologies that can be disadvantaged by lack of customer exposure and experience. However, in order for a technology to be a sustainable and durable solution, it must demonstrate the ability to compete on the same basis with other technologies to allow consumers the choice that meets their needs while meeting performance based standards. U.S. EPA recognized this in its 2011 rule by phasing out credits for MY2022-2025 PHEVs, BEVs and FCEVs. Similarly the European Commission has phased down the magnitude of multipliers in their 2015 standards from 3.5 to 1.5 over three years and in the 2020 standards from 2 to 1.3 by 2022. Supercredits have been virtually eliminated in the latest European proposal for model years 2025-2030 with multipliers of only 1.2 to 1.1. These powertrain technologies have been around for decades and have matured to the point where almost every manufacturer is offering several electrified models for a total of over 50 models equipped with these technologies, allowing consumers to make informed choices with respect to advanced powertrain vehicles. Vehicle manufacturers have made public announcements of 85 different models of electrified vehicles being available by 2021.

MECA also supports the amendment to incentivize low fuel consumption vehicles with

combined fuel consumption no more than 3.2 L/100km such that they will be counted as 1.4 vehicles in 2021 and phase down to 1 in 2025. In addition, we support the inclusion of low fuel consumption vehicles as counting towards an OEM's annual NEV production or import requirement. The types of vehicles that could meet these ultra-low fuel consumption levels will likely include hybrid-electric vehicles that couple advanced engine technologies with advanced electrification technologies. Hybrid electric vehicles continue to improve as advanced combustion, efficiency and electrification technologies are commercialized, and incentives will enable faster penetration into the passenger car fleet. Furthermore, a recent article presented the environmental sustainability of fleet penetration of long range electric vehicles compared to similar penetration of hybrid electric vehicles and found the latter was a more sustainable pathway (<https://seekingalpha.com/article/4271072-long-range-evs-antithesis-efficiency-sustainability>). For example, 100 kWh of lithium-ion batteries could be used to build one Model S and save one driver 385 gallons of fuel a year (compared to a similar sized combustion vehicle) or 600 gallons per year (compared to a high fuel consumption vehicle). However, 100 kWh of lithium-ion batteries also could be used to build a 100-unit fleet of Prius L-Ecos that would each save 180 gallons of fuel per year, for a total savings of 18,000 gallons of fuel. MECA members support the long term goals of a net zero emission light-duty fleet. As providers of technologies for efficient engines, hybrids and NEVs, we recognize that the pathway to electrification has market challenges that must be addressed, such as battery material availability, infrastructure and consumer acceptance. As governments and industry address these challenges and markets respond, we must continue to make progress in improving the efficiency of all vehicles rather than trying to preferentially pick winners. MIIT's innovative approach takes a step in the right direction, and future pragmatic amendments can be made beyond 2023 in response to market demands and energy security goals.

A recent ICCT report (https://www.theicct.org/sites/default/files/publications/ZEV_Regulation_Briefing_20181017.pdf) notes that the phase-out of multipliers in Europe and the United States in 2022–2023 shows the increased understanding that artificial incentives serve as temporary, early-market sparks for these larger markets but can lead to substantial trade-off in fuel consumption and CO₂ benefits if not done correctly. Given the number of electric vehicle model offerings and declining costs of these vehicles, large credits to OEMs are not needed to incentivize production, and an over incentivized credit scheme will instead result in erosion of the benefits anticipated by the standards. MECA recommends switching from the zero accounting method to a lifecycle fuel consumption equivalent accounting method for NEVs. ICCT concludes that switching to an upstream accounting method will effectively reduce requirements for conventional vehicles from 5 L/100km by 2025 to 4.2 L/100km.

A recent article by Kevin Brown (<https://www.linkedin.com/pulse/driving-towards-zero-next-steps-co2-reduction-seen-popular-brown/?trackingId=>) illustrates how much of an impact the upstream power generation mix has on the GHG emissions footprint of a vehicle. While the figure below is specific to the United States, an extrapolation could be used to estimate similar curves for China based on the current and projected Chinese energy mix. For perspective, the Michigan and Mid-west states generate 50-60% of their power from coal-fired power plants. Given China currently generates 70% of its power from coal and has a target of 50% by 2040, the green line that represents Michigan and Mid-west states is the best approximation for CO₂ emissions from tailpipe plus upstream power generation for electric vehicles in China. By extrapolating the “Gasoline & Hybrid” curve (red line) out to 3.2 L/100 km (approximately 73

miles per U.S. gallon) in the figure below, the data suggest that on a life cycle basis, a fuel efficient vehicle consuming 3.2L/100 km of fuel will emit less than half of the CO₂ compared to a NEV powered by electricity generated in China.

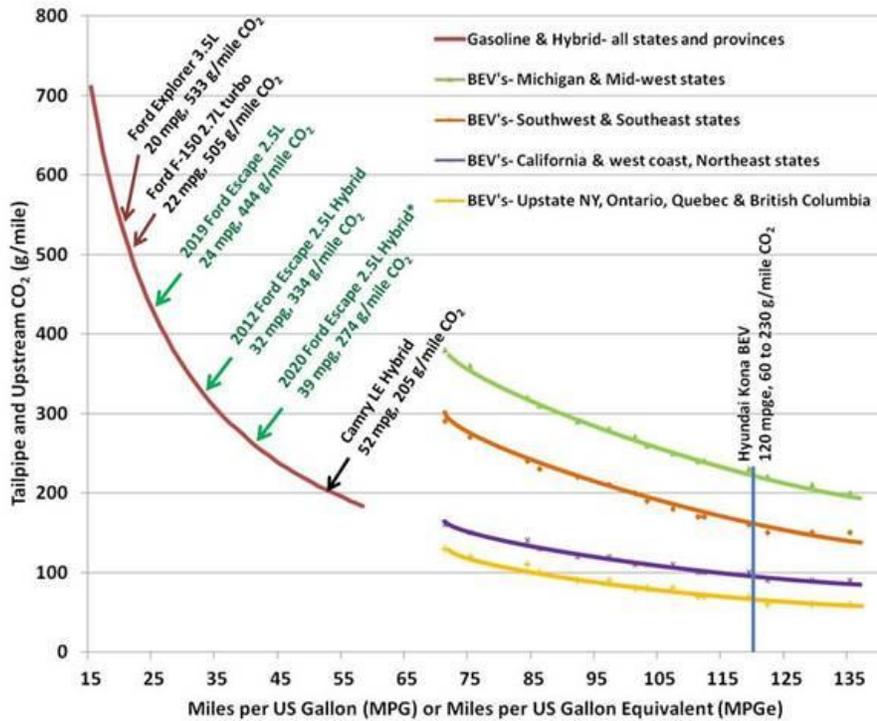


Figure. Ford's Next Generation 2020 Hybrids will Provide Efficient CO₂ Reductions

In conclusion, MECA commends MIIT for taking a bold and innovative approach to vehicle efficiency policy to reduce greenhouse gas emissions and improve fuel economy from passenger cars. We support the proposed amendments that will incentivize continual investment in fuel efficient engines, hybrid electric vehicles, battery and fuel cell electric passenger cars that will result in greater benefits to China's energy security and environment. These incentives will also allow for the automotive industry to invest in China and grow jobs in the auto sector. We encourage MIIT to consider a life cycle approach to electrification that will ensure that the most energy efficient technologies are deployed and deliver the true efficiency and GHG reduction goals of this program. MECA members are prepared to do our part and deliver cost-effective advanced emission control and efficiency technologies to the light-duty sector to assist in achieving lower fuel consumption while also meeting future reductions in criteria pollutants.

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