

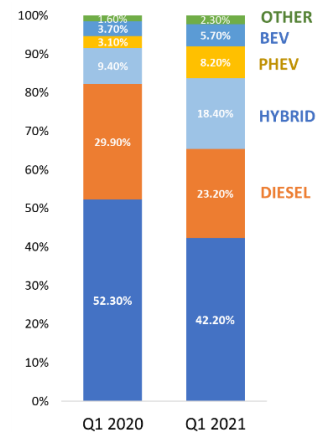
### Market Update

- Every fifth vehicle in Europe is now a hybrid: Compared to Q1 2020, hybrids doubled their share to > 18% of new vehicle sales in Europe. Share of BEVs and PHEVs was 5.7% and 8.2%, respectively, for a combined 14% of electrically chargeable vehicles, also doubled compared to 7% in Q1 2020. Diesel vehicle sales continued their downward slide to 23%, reduced from 30% the same time last year.

<https://www.acea.be/press-releases/article/fuel-types-of-new-cars-battery-electric-5.7-hybrid-18.4-petrol-42.2-market>

- Stellantis expects to meet its CO<sub>2</sub> targets in Europe without resorting to credits purchased from Tesla. This is in part due to the lower overall CO<sub>2</sub> emissions through the merger with PSA which has a strong electrified powertrain portfolio.

<https://europe.autonews.com/environmentemissions/stellantis-hit-emissions-target-without-teslas-help-ceo-tavares-says>



### Regulations



#### Europe

- The EU Commission's Advisory Group on Vehicle Emission Standards (AGVES) held its last public meeting before the formal Euro 7 proposal expected later this year. The meeting covered the latest updates from the CLOVE consortium, tasked with recommending scenarios for Euro 7 / VII light- and heavy-duty regulations. Some updates:
  - The cold start "budget" for the first 16 kms was discussed. Some stakeholders suggested that the distance be reduced to better reflect urban driving.
  - The details on the exclusions which may apply in the first couple of kms are yet to be clarified.
  - N<sub>2</sub>O and CH<sub>4</sub> may have separate limits and treated as pollutants OR considered as greenhouse gases and regulated under a combined limit with CO<sub>2</sub>. This has implications for diesel and natural gas engines.
  - The regulation aims to be technology and fuel neutral. Various limits are being explored based on possible fuel and technology combinations. The limits will also be decided only after an impact assessment.
  - The Commission made it clear that the regulations are not aimed at "killing the ICE" and that due consideration will be given to propose something that is both pragmatic and beneficial.
- Following Netherlands, Belgium will also adopt the new periodic technical inspection (NPTI) to identify diesel vehicles with missing or damaged filters starting July 2022.

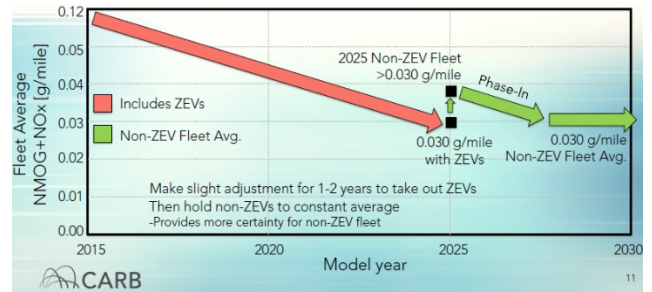
<https://dieselnet.com/news/2021/04be.php>

## US

- CARB held the 2<sup>nd</sup> Advanced Clean Cars II workshop on May 6<sup>th</sup>. Some elements discussed -

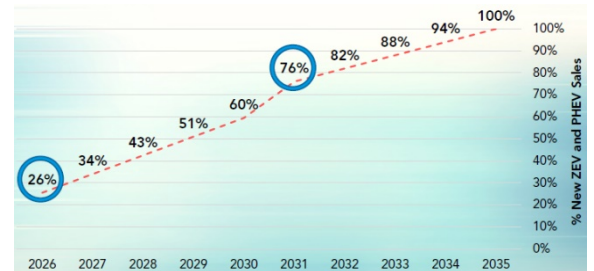
### LEV Criteria Pollutant

- Separate non-ZEV fleet averaged limit of 30 mg/mi for combined NMOG + NOx. New bins to be added down to SULEV10 and some of the higher bins removed.
- Certification based on stand-alone standards for FTP, US06 and SCO3 tests. NMOG + NOx standard for US06 to be set to same value as FTP.
- Cold start emissions after an intermediate soak (20 min – 5 hour): Emissions limits proportional to soak time between 10 min and 3 hours. For soaks > 3 hours, must meet overnight soak emissions.
- Modifying the FTP test to reduce idle time from 20 sec to 5 sec
- High powered cold starts from PHEVs: New US06 cold-start standard based on best performers.
- Particulate standards: US06 limits to be reduced but actual limit to be decided (likely at or below 3 mg/mi).
- Medium-duty vehicles (Class 2b – 3) to be required to meet in-use testing procedures and standards from HD Omnibus Rulemaking.



### ZEV Proposal

- Goal is to achieve 100% electric sales by 2035.
- Move from credit driven to sales driven approach: one ZEV credit per ZEV, with 5-year credit life.
- PHEVs must have > 50mi all-electric range, must be able to complete US06 on all electric mode, and meet SULEV30 & zero evaporative emission standards. 20% cap on PHEVs allowed to fulfill OEM obligation to ZEV requirements.
- Battery pack costs are expected to decrease from \$100/kWh in 2026 to \$63/kWh in 2035.



Presentations to be uploaded here: <https://ww2.arb.ca.gov/advanced-clean-cars-ii-meetings-workshops>

- A new study has highlighted the environmental inequity in the US: despite decades of progress with air quality, the effects of pollution are disproportionately borne by disadvantaged communities, people of color and lower income. <https://www.washingtonpost.com/climate-environment/2021/04/28/environmental-justice-pollution/>
- The US EPA has set in motion the process to reinstate the waiver given to California to set its own greenhouse gas (GHG) standards for cars and light trucks. It is expected that California will set tighter CO<sub>2</sub> limits on future light-duty vehicles, more stringent than the Obama era standards (~ 5% reduction in CO<sub>2</sub> per year) to make up for “lost time”. <https://www.epa.gov/newsreleases/epa-reconsiders-previous-administrations-withdrawal-californias-waiver-enforce>

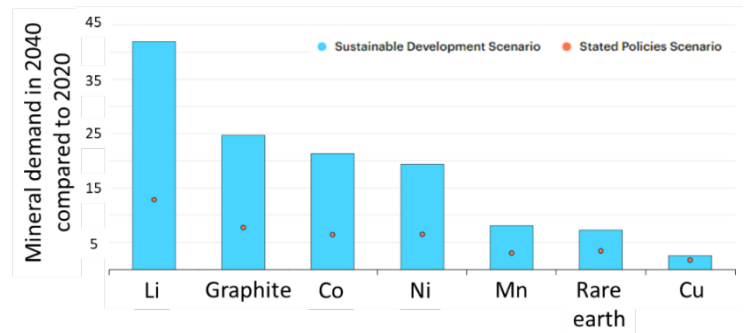
## China

Per a latest announcement by the Ministry of Ecology and Environment (MEE) of China, conformity factors for NOx and PN will be set at 2.1 for China 6b, which starts 2023. Further RDE details are yet to be finalized including whether to include cold start emissions or not.

[http://www.mee.gov.cn/xxgk2018/xxgk/xxgk01/202104/t20210426\\_830502.html](http://www.mee.gov.cn/xxgk2018/xxgk/xxgk01/202104/t20210426_830502.html)

## Electrification / Non-conventional fuels

- A recent report by the International Energy Agency highlights the challenges expected for meeting the minerals demand for producing batteries in the coming decades. Lithium demand is expected to grow ~ 12 – 42X by 2040 compared to 2020. Other minerals will also see a significant increase. The limiting factor is not in the total availability of the minerals but how quickly they can be extracted to meet this increase in demand.



<https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions/executive-summary>

- Washington State has passed a measure that will only allow the sale and registration of fully electric vehicles starting 2030. The “Clean Cars 2030” bill will also require a tax on vehicles that is proportional to the miles driven, to pay for roads and infrastructure (this presumably makes up for lost tax revenue from gasoline sales).

<https://www.theverge.com/2021/4/17/22389088/washington-state-vote-ban-gasoline-cars-2030-electric>

- New Jersey is proposing its version of California’s Advanced Clean Trucks program. Starting 2025, it is proposed that manufacturers sell zero-emitting medium- and heavy-duty trucks as an increasing percentage over the years.

<https://www.njspotlight.com/2021/04/nj-wants-electric-trucks-better-air-quality-following-california-model-strong-manufacturers-opposition-expected-aggressive-clean-energy-goals/>

- Ford plans to invest \$185 million into a new battery lab aimed at developing battery technology. Along with BMW, it will also invest \$130 million in a solid-state battery start-up, Solid Power.

- Toyota announced that it is developing a hydrogen engine, with the first application for racing vehicles. The engine is a 1.6L, 3-cylinder turbocharged engine working with compressed hydrogen.

<https://global.toyota/en/newsroom/corporate/35209996.html>

### *Don't miss these upcoming events ...*

**Emissions 2021, May 12<sup>th</sup> – 13<sup>th</sup>, 2021, online**

<https://gamcinc.com/conferences/emissions/>

**33<sup>rd</sup> International AVL Conference “Engine & Environment”, May 20-21, 2021, Graz, Austria or online**

<https://www.avl.com/-/engine-environment>

**DOE Annual Merit Review**

Washington Hilton in Washington, D.C., on June 21-24, 2021

<https://www.energy.gov/eere/vehicles/vehicle-technologies-annual-merit-review>

**24<sup>th</sup> ETH-Conference on Combustion Generated Nanoparticles at ETH, Zürich, Switzerland, June 22<sup>nd</sup> – 24<sup>th</sup>, 2021, online**

<https://www.nanoparticles.ch/>