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## Market

### Honda, Nissan, Mitsubishi possible merger

Honda and Nissan may be heading for a merger, and recently the two OEMs and Mitsubishi [signed](#) a Memorandum of Understanding (MoU) to include the latter in the business integration. The potential merger will be discussed over the coming months, and if successful, will create the third largest auto manufacturer by sales, trailing Toyota and Volkswagen.

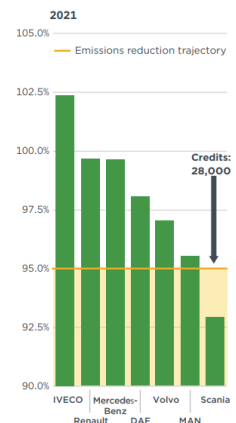


### Honda advancing hybrids with 50% cost reduction by 2027

Honda has [announced](#) its intent to significantly improve on its 2-motor hybrid system, e:HEV. Citing the recent increased interest in hybrids, Honda is now aiming to increase global hybrid sales to 1.3 million units by 2030, while cutting cost of new hybrid models in half by 2027 compared to 2018 through component cost and production improvements. New 1.5L and 2.0L direct-injection Atkinson cycle engines along with improved motors will be paired with a next-gen mid-size platform to enable 10% fuel efficiency improvement. Electric all-wheel drive and vehicle weight reduction by 90 kg are some of the other enhancements.

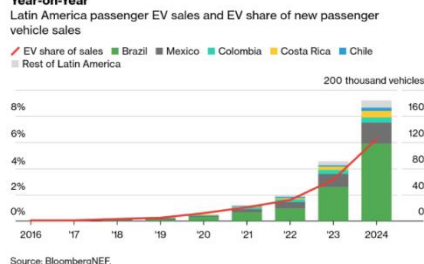
### Heavy-Duty Vehicles in Europe lag upcoming CO<sub>2</sub> Emissions Target

A new report from the ICCT has analyzed the certification data published by the European Environmental Agency for CO<sub>2</sub> emissions of new European HDVs in 2021. On average, CO<sub>2</sub> emissions decreased from 56.6 g-CO<sub>2</sub>/ton-km in 2019, to 55.5 g-CO<sub>2</sub>/ton-km in 2021. The improvements are attributed to a small increase in engine efficiency, incremental gains in aerodynamic drag and tire rolling resistance, and the inclusion of ZEVs. Still, the ~ 1% annual average reduction in CO<sub>2</sub> emissions is less than the 2.5% annual reduction required to meet the target of 15% reduction by 2025 versus a 2019 baseline. Only Scania is on track to meet the 2025 requirements.



### EV sales in Latin America poised for growth with Chinese entrants

Latin America's Electric Vehicle Sales Have More Than Doubled Year-on-Year



While most of the focus for electric vehicle growth is centered on China, Europe and US, a recent report from BloombergNEF estimates that EV sales (as always, EVs mean BEV and PHEV) in Latin America have more than doubled this year to cross 8% share. 2/3<sup>rd</sup> of these EV sales are in Brazil, the largest regional auto market, and where BYD and Great Wall Motors plan to start assembly in 2025.

## Regulations

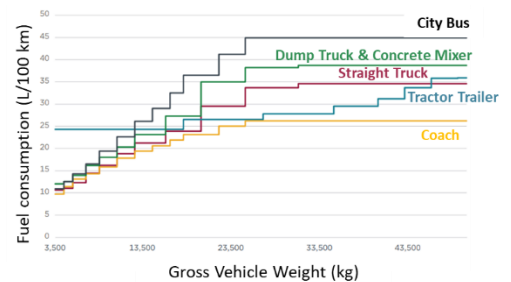


### EPA Grants California waivers on ACC II and HD Low NOx

- The U.S. Environmental Protection Agency (EPA) has [granted](#) California the waiver to implement the Advanced Clean Cars II (ACC II) regulations for light- and medium-duty vehicles. California Air Resources Board (CARB) had requested the waiver in December 2023. The ACC II is implemented starting MY 2026 and includes provisions for tightening criteria pollutants under the LEV IV program, as well as the mandates for increasing ZEV sales. The new administration is expected to review this waiver as it is against any mandates on electric vehicle sales.
- EPA has also [granted](#) the waiver for the Heavy-Duty Vehicle and Engine “Omnibus” Low NOx Regulations (“Omnibus Low NOx program”), a request for which was received in June 2022. The regulation sets lower NOx and PM standards for MY 2024 – 26 engines, after which CARB aligns with the national low NOx standards. The EPA has also granted authorizations for portions of the program which reduce PM limits for off-road auxiliary power units powered by diesel engines.

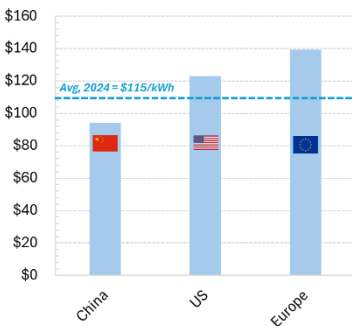
### China Stage 4 Fuel Consumption Standards for Heavy-Duty Commercial vehicles

China Stage 4 fuel consumption for HD commercial vehicles will be implemented starting July 2025. A recent [report](#) by the International Council on Clean Transportation (ICCT) summarizes the standards, which will require a ~ 12 – 16% reduction in fuel consumption, per vehicle, compared to Stage 3. The test cycle is changed from China-World Transient Vehicle Cycle (C-WTVC) to the China Heavy-duty Commercial Vehicle Test Cycle (CHTC), which is tailored to various vehicle types. The latest standard also extends to hybrid vehicles for the first time.



## Electrification, Hydrogen

2024 Average Li-ion Battery Pack Prices  
Source: BloombergNEF



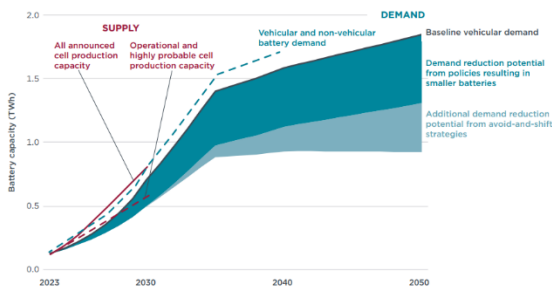
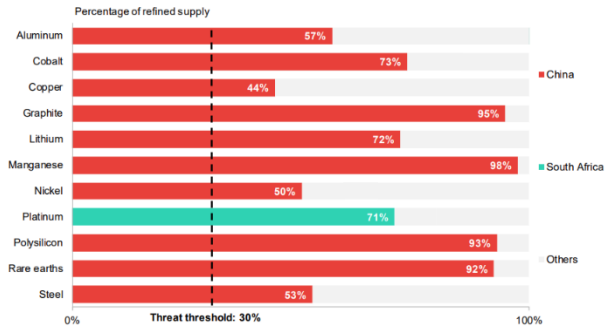
### Battery pack prices fall by 20% to \$115 per kWh

According to [BloombergNEF](#), battery pack prices fell 20% in 2024 to reach \$115/kWh. The price drop is attributed to several factors such as overproduction, economies of scale, lower raw material prices, lower-than-anticipated EV sales, and adoption of lower cost batteries such as LFP. Battery capacity has reached over 3 TWh, while the demand in 2024 was 1.2 TWh for EV and stationary storage. While the above numbers are an average across several sectors, the price of batteries for EVs was estimated at \$97/kWh. BNEF estimates the prices to reach \$69/kWh in 2030.

## Energy transition will require > \$1.6T in investment & regional diversity for supply of critical materials

The Transition Metals Outlook 2024 [report](#) by BNEF estimates that lithium and manganese demand is set to grow 17- and 15-times, respectively between 2023 to 2050 to meet the net zero targets in that timeframe. The report warns that the current pace of mining and recycling investment will be insufficient to meet the needs. It highlights the dominance of China in the supply of several critical materials, seen as a geopolitical risk to the energy transition. Investment upward of \$1.6 trillion is estimated to be required for mining and refining of these metals.

Figure 7: Refined supply of energy transition metals in 2023, by top producing country



## Smaller batteries, recycling and avoid-and-shift strategies necessary to ease the battery burden

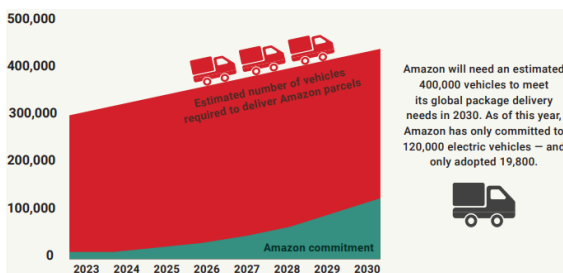
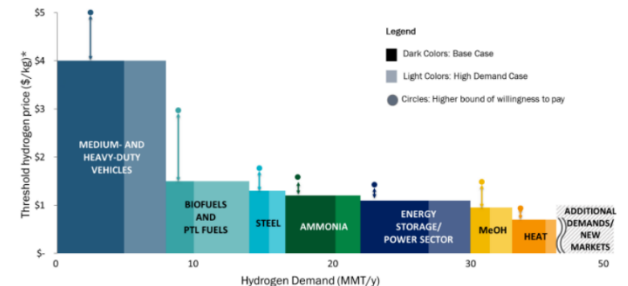
While the BNEF report above highlights the need for further investments to cope with the growing battery demand, another [report](#) by the ICCT suggests ways to reduce the demand through smaller battery packs, recycling and moving to other modes of transport with a lower carbon footprint. Considering various

regions, the report concludes that while announced battery capacity exceeds expected demand in certain regions (e.g. China), the situation is unclear in other regions (e.g. Europe), which will have to adopt the above strategies to curtail demand.

## DOE Hydrogen Program Plan

The US DOE has [published](#) the latest version of its hydrogen program plan, which outlines the goals and activities across several offices to enable the adoption of hydrogen technologies across multiple applications and sectors.

It outlines the short- and longer-term technologies required in all aspects of the hydrogen economy – production, delivery, storage and conversion. The document estimates the price of H<sub>2</sub> required to enable various applications (e.g. \$4/kg is needed for the fuel cell market of heavy-duty vehicles).



## Something to think about -

It's the time of the year for sending and receiving packages. Stand.earth, a research think tank has [estimated](#) that five years since the Climate Pledge in 2019, CO<sub>2</sub> emissions at Amazon have increased 190% for delivery vans and 51% for heavy-duty trucks. EVs deployed to date are yet to make a dent in the emissions, and

seem to be a losing battle against the ever-increasing fleet required to keep up with holiday shopping.

On that cheerful note – Wish all readers of MobilityNotes a Happy Holiday Season and great 2025 ahead!!

## Conferences 2025

Here are some upcoming conferences to consider attending –

**Clean Fuels Conference, Jan 20 – 23, San Diego**

<https://www.cleanfuelsconference.org/>

**SAE Government Industry Meeting 2025, Jan 28 – 30, 2025, Washington, D.C.**

[2025 Government/Industry Meeting \(sae.org\)](https://www.sae.org/conferences/2025-gov-industry-meeting)

**Emissions Analytics Tyre Emissions & Sustainability Europe, February 11 – 12, Prague**

[Tyre Emissions and Sustainability Europe 2025](https://www.ea.com/tyre-emissions-and-sustainability-europe-2025)

**National Ethanol Conference, February 17 – 19, Nashville, Tennessee**

<https://nationalethanolconference.com/>

**TMC's Annual Meeting & Transportation Technology Exhibition, March 10 – 13, Nashville, Tennessee**

<https://tmcannual.trucking.org/>

**Hydrogen for Sustainable Mobility Forum, March 11 – 12, Politecnico di Torino**

<https://www.eventleaf.com/e/H2SMForum2025>

**On-Board Diagnostics Symposium-Europe, March 11 – 13, Porto, Portugal**

<https://www.sae.org/attend/obd-europe>

**International Battery Seminar & Exhibit, March 17 – 20, Orlando, FL**

<https://www.internationalbatteryseminar.com/>

**SAE WCX 2025, April 8 – 10, Detroit, Michigan**

[WCX 2025 - April 8-10 \(sae.org\)](https://www.sae.org/conferences/wcx-2025)

**35<sup>th</sup> Real World Emissions Workshop, April 13 – 16, Long Beach, California**

[35th CRC Real World Emissions Workshop - Coordinating Research Council \(crcao.org\)](https://www.crcrao.org/35th-crc-real-world-emissions-workshop)

**Advanced Clean Transportation Expo, April 28 – May 1, Anaheim, California**

<https://www.actexpo.com/>

**Emissions Analytics Tyre Emissions & Sustainability USA 2025, April 30 – May 1, Irvine CA**

[Tyre Emissions and Sustainability USA 2025](https://www.ea.com/tyre-emissions-and-sustainability-usa-2025)

**Heavy-Duty Sustainable Transport Symposium, May 7 – 8, Gothenburg, Sweden**

[Heavy-Duty Sustainable Transport Symposium \(sae.org\)](https://www.sae.org/conferences/heavy-duty-sustainable-transport-symposium)

**46<sup>th</sup> International Vienna Motor Symposium, May 14 – 16, Vienna**

<https://wiener-motorensymposium.at/en/>

**Off-Highway Powertrain & Fuels USA 2025, May 21 – 22, Chicago**

<https://conferences.emissionsanalytics.com/offhighway-us25/index.html>

**2025 Annual Merit Review (AMR), June 2-5, Arlington, Virginia**

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

**KSAE/SAE 2025 Powertrain, Energy & Lubricants Conference & Exhibition, June 22 – 25, Busan, S. Korea**

<https://www.pel2024.org/>

**16<sup>th</sup> Annual Growth Energy Biofuels Summit, Sept 8 – 11, 2025, Washington, D.C.**

<https://growthenergy.org/event/2025-biofuels-summit/>

**17<sup>th</sup> Intl. Conf. on Engines & Vehicles for Sustainable Transport, Sept 14 – 17, Capri, Naples, Italy**

<https://www.sae-na.it/index.php>

**COMVEC™, September 16 – 18, Schaumburg, Illinois**

<https://comvec.sae.org/>

**The Aachen Colloquium Sustainable Mobility, October 6 – 8, Aachen**

<https://www.aachener-kolloquium.de/en/>

**SAE Brazil 2025 Congress, October 6 – 8, Brazil (place TBD)**

<https://saebrasil.org.br/eventos/congresso-sae-brasil-2024-258/>

**Non-Road Powertrain & Fuels Europe 2025, October 7 – 8, Munich**

<https://conferences.emissionsanalytics.com/nonroad-eu25/index.html>

**2025 Energy & Propulsion Conference & Exhibition, October 14 – 16, Ypsilanti, Michigan**

<https://www.sae.org/attend/energy-propulsion-conference>

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