

METHODS OF COLLECTION AND ANALYSIS OF TRACKING METRICS

- **ICE Phaseouts: Cars and Vans**

The tables contain every policy in the map and additional phaseout (percentage share of sales/stock) targets that do not meet the criteria set by the map. Some demand and supply-side ZEV regulations targeting significant phaseouts are also included in the table as well. In case a policy covers vehicles other than cars and vans, details about that are included in the policy summary as well.

- **ICE Phaseouts: Buses**

The tables contain every policy in the map and additional phaseout (percentage share of sales/stock) targets that do not meet the criteria set by the map. Some demand and supply-side ZEV regulations targeting significant phaseouts are also included in the table as well. In case a policy covers vehicles other than buses, details about that are included in the policy summary as well.

- **ICE Phaseouts: Trucks**

The tables contain every policy in the map and additional phaseout (percentage share of sales/stock) targets that do not meet the criteria set by the map. Some demand and supply-side ZEV regulations targeting significant phaseouts are also included in the table as well. In case a policy covers vehicles other than trucks, details about that are included in the policy summary as well.

- **Supply-side ZEV regulations: LDV**

Only regulations (excluding bills and policy documents) that are not procurement mandates are covered here. Also covers regulations that target non-LDVs and the details of those in the policy summary. Does not cover GHG standards that will lead to phaseout of ICE vehicles since those standards do not directly specify sales share of EVs.

- **Supply-side ZEV regulations: HDV**

Only regulations (excluding bills and policy documents) that are not procurement mandates are covered here. Also covers regulations that target non-LDVs and the details of those in the policy summary. Does not cover GHG standards that will lead to phaseout of ICE vehicles since those standards do not directly specify sales share of EVs.

- **Demand-side ZEV regulations: Low emission and zero emission zones**

In this analysis, ZEVs are vehicles that do not produce tailpipe pollutant emissions at any point of use, and this means battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs). Some zones extend unrestricted access to plug-in hybrid electric vehicles (PHEVs), which can produce zero tailpipe emissions when operating in the zones, and we refer to these as near-zero-emission zones (near ZEZs). Zones that further extend unrestricted access to any other vehicles besides ZEVs and PHEVs, such as non-plug-in hybrid electric vehicles (HEVs) and compressed natural gas (CNG) vehicles, are not treated as variants of ZEZs.

More details on the analysis can be found here: <https://theicct.org/wp-content/uploads/2022/09/Global-ZEZs-update-09292022.pdf>

- **Demand-side ZEV regulations: Fleet purchase rules**

Only regulations (excluding bills and policy documents) that are public procurement mandates are covered here. Does not cover GHG standards that will lead to phaseout of ICE vehicles since those standards do not directly specify sales share of EVs.

- **Efficiency and GHG standards: LDV**

Efficiency and GHG standards were collected on the basis of their original test procedures and then converted into CAFÉ for ease of comparison using the tool here: <https://theicct.org/wp-content/uploads/2022/03/Conversion-tool-20141121-Protect.xlsx> with detailed methods provided here: <https://theicct.org/publication/development-of-test-cycle-conversion-factors-among-worldwide-light-duty-vehicle-co2-emission-standards/>. Historical data and projections are calculated on the basis of official documents linked in the table as well as further sources cited here: <https://theicct.org/publication/development-of-test-cycle-conversion-factors-among-worldwide-light-duty-vehicle-co2-emission-standards/>

- **Efficiency and GHG standards: HDV**

Efficiency and GHG standards were collected and tabulated using their original test procedure standards. Only adopted policies are considered, as several of the proposed HDV policies may undergo significant change on the basis of public comments and other considerations.

- **Charging infrastructure policies**

A summary of the major developments in charging infrastructure policies is provided over the past year. Covers only ZEVTC and major markets, and a focus is given on more concrete regulations and policies with firm numerical targets (e.g. number of chargers and specific financial commitments).

- **ZEV Sales: Cars and vans**

2022 and 2023 data for EU, Norway and United Kingdom collected from Dataforce. The remainder of the 2022 data is collected from EV Volumes but vetted against third party sources such as ZEData (China), Segment Y (India), and Atlas (USA). All 2023 data are collected from EV Volumes.

- **ZEV Sales: Buses**

The 2021 data was sourced from ZEData (China); Segment Y (India); IHS (other countries except Canada, Japan, Mexico and South Korea), IEA (Canada, Japan, Mexico, and South Korea). The 2022 data was sourced from the same data sources except Canada, Japan, Mexico and South Korea which were projections from IEA's Energy Technology Perspectives 2022.

- **ZEV Sales: Trucks**

The 2021 data was sourced from ZEData (China); Segment Y (India); IHS (other countries except Canada, Japan, Mexico and South Korea), IEA (Canada, Japan, Mexico, and South Korea). The 2022 data was

sourced from the same data sources except Canada, Japan, Mexico and South Korea which were projections from IEA's Energy Technology Perspectives 2022.

- **ZEV Cost competitiveness: Retail ZE and ICE LDV**

The original price data (along with relevant incentive and tax information) is sourced from various manufacturer websites, as listed below

Country	URL
Germany	https://www.volkswagen.de/
United Kingdom	https://www.nissan.co.uk/
France	https://www.peugeot.fr/
United States	https://www.vw.com/en.html https://www.toyota.com/
Canada	https://www.vw.com/en.html https://www.toyota.com/
Japan	https://www3.nissan.co.jp/en.html http://toyota.jp/index.html
India	https://cars.tatamotors.com/cars/tigor https://www.nexaexperience.com/baleno

The following inclusions and exclusions are applicable to ICE prices and pre-incentive EV prices:

- Germany - Excluding delivery and registration costs, including VAT. Includes Umweltbonus and Innovationprämie incentives.
- United Kingdom - Including VAT and vehicle tax incentives.
- France - Excluding registration fee, including VAT and delivery fee. Includes Bonus écologique and Prime à la conversion incentives.
- United States – Including destination charges, delivery, processing and handling fees. Includes Federal Tax credit incentives.
- Canada – Including dealer fees and delivery charges. Includes federal iZEV rebate.
- Japan – Excluding tax, insurance premium, compulsory liability insurance, recycling costs, registration fee. Including consumption tax and national purchase subsidy.
- India – Ex-showroom prices. Includes ₹10,000/kWh up to 20% of the cost base.

All local currency values are converted to USD using 2022 inflation rates from

<https://data.oecd.org/conversion/exchange-rates.htm>

- **ZEV Cost competitiveness: TCO ZE and ICE HDV**

The list of studies chosen are on the basis of the ICCT studies published in [May 2022](#) and [April 2023](#). Some vehicle segments were aggregated to reduce duplication and provide meaningful sample size (e.g. Class 8 tractor trailers and heavy duty tractor trailers were aggregated). On a number of cases, if a range is provided for the TCO parity, the midpoint is taken, e.g. if a 2040-2050 range is provided, the assumed value is 2045. If Before or After values are provided then the explicit value is the assumed value for Before and explicit value + 1 year for after, e.g. if it is Before 2030, we assumed 2030, if it is after 2035, we assume it is 2036. The same research group may be involved in multiple studies and given different

projections for broadly the same vehicle class. Subnational targets for US, and intra-EU targets are aggregated for ease of comparison between the major global markets. A median of medians approach is taken to obtain the final values. For example, if the median values for a given segment and market in three studies (each study potentially having a range of TCO parity values from which a median gets picked) are 2030, 2035 and 2033, then the median for that segment and market is 2033.

- **Charging infrastructure statistics**

Charging infrastructure statistics are taken from multiple sources as specified in the table. Generally the 2022 and Q1 2023 sources are consistent but in the cases they are not, ICCT research has vetted that the 2022 and Q1 2023 values are comparable. For all markets except India, separate AC and DC values for total chargers were obtained. The 2022 values are from January 2023 EXCEPT for Mexico, Australia and New Zealand. The cut-off for Q1 2023 values are indicated by the month in the Period column. Only the European countries have charger capacity (and as a result, average capacity) figures. The ICCT will attempt to estimate charger capacity for other markets in future updates, but these will only be approximate estimates.