

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/2021/12/global-cities-zez-dev-EN-aug21.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 3P WLTP 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**

2020 data is collected from a variety of sources including: [MOVES3](#) (USA); India Emissions Model (India); [ICCT Pocketbook](#) (EU, Norway and UK); [CATRAC](#) (China); [EV Volumes](#) (other countries). 2021 data, with the exception of EU, Norway and UK (which is collected from Pocketbook) is collected from EV Volumes. The EV Volumes data is considered provisional and may be replaced by higher quality data from region-specific sources in future updates as available.

- **ZEV Sales: Buses**

The 2021 data quality is uncertain at this point and hence not published. In future updates, we anticipate 2021 data to be included. The 2020 data was sourced from CATARC (China); MOVES3 (USA); India Emissions Model (India); and IHS (other countries).

- **ZEV Sales: Trucks**

The 2021 data quality is uncertain at this point and hence not published. In future updates, we anticipate 2021 data to be included. The 2020 data was sourced from CATARC (China); MOVES3 (USA); India Emissions Model (India); and IHS (other countries).

- **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://store.vauxhall.co.uk
France	https://www.renault.fr/achat-vehicules-neufs/vehicules.html
United States	https://www.chevrolet.com/electric https://www.toyota.com/camry/
Canada	https://www.chevrolet.ca/en/electric/bolt-ev https://www.honda.ca/civic_sedan/trims/lx_10700
Japan	https://theicct.org/publication/asia-vehicle-taxation-jan22/
India	https://bookonline.tatamotors.com/nexonev https://cars.tatamotors.com/suv/nexon/price

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

Germany - Excluding delivery and registration costs, including VAT

United Kingdom - Excluding Deposit contribution, including VAT

France - Excluding reprise, including all taxes

United States - Excluding destination freight charge

Canada - Excluding tax, title, license, options and destination charge, including GST PST

Japan - Including 10% excise tax

India - Excluding all taxes

All local currency values are converted to USD using 2021 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 analysis published in December 2021

(https://theicct.org/wp-content/uploads/2021/12/ZEVTC_EffectivePolicies_dec2021.pdf). 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 2020 and 2021 sources are consistent but in the cases they are not, ICCT research has vetted that the 2020 and 2021 values are comparable. For all markets except India, separate AC and DC values for total chargers were obtained. For all markets except India and California, 2020 AND 2021 values are obtained. The 2021 values are from January 2022 EXCEPT for Mexico, Australia and New Zealand where the values are from October 2021. The 2020 values are from January 2021 EXCEPT for Japan, Mexico and Australia where the values are from October 2020. 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.