

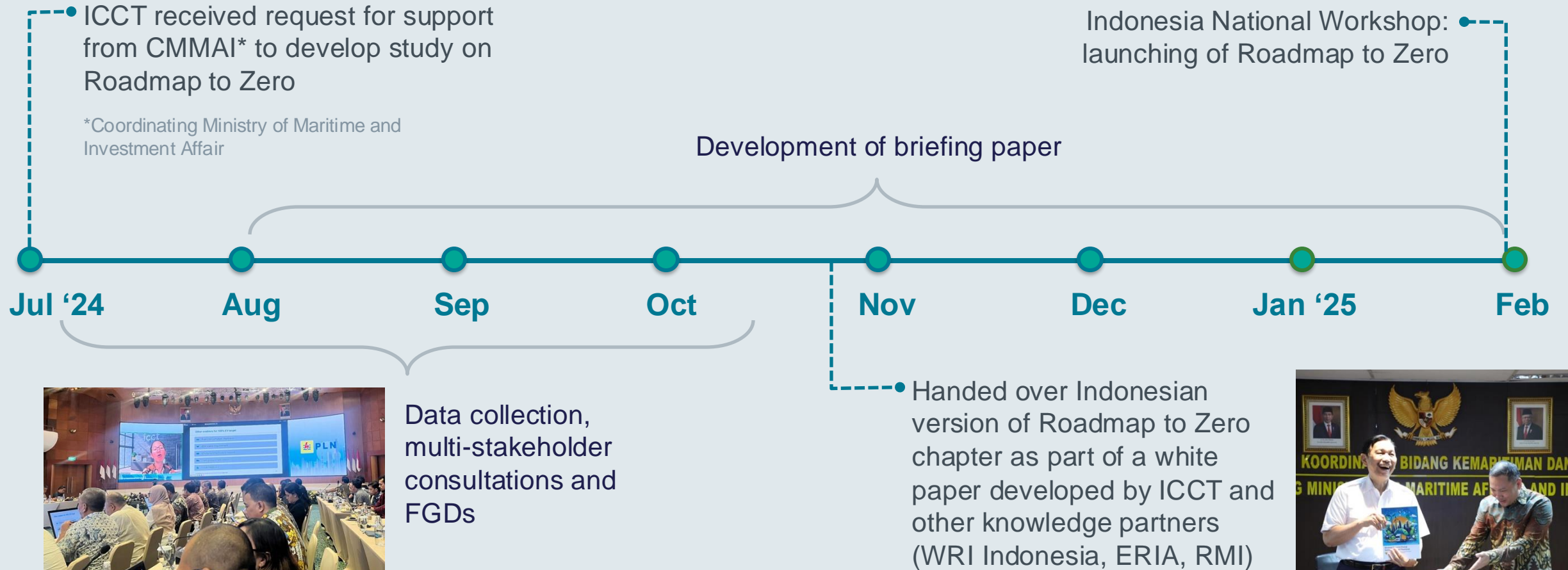
# Roadmap to zero: Pathways and policies to achieve net-zero road transport in Indonesia by 2060

Ray Minjares  
Managing Director  
International Council on Clean Transportation

*Presented on February 12th, 2025, in Jakarta, Indonesia during the launch of Roadmap to Zero report:*

*Miller, J., Syahputri, J., Hall. Dale., Mahalana. A., Posada. F., (2024). Roadmap to zero: The pace of Indonesia's electric vehicle transition. International Council on Clean Transportation. <https://theicct.org/publication/pathways-and-policies-to-achieve-net-zero-road-transport-in-indonesia-by-2060-feb25/>*

# Timeline



# The True Cost of Transportation: Indonesia's Economic and Environmental Tradeoffs

## Environmental Impact:

Road transport drives **22%** of Indonesia's energy-related emissions  
(IEA, 2022; GoI, 2021)

## Public Health Crisis:

Vehicle emissions linked to **4,500 preventable deaths** annually  
2015  
(Anenberg et al., 2019)

## Economic Dynamics:

The automotive sector powers Indonesia's economy, generating **8% of GDP** and sustaining **1.5 million jobs** across its value chain  
(Indonesia Statistics, 2024)

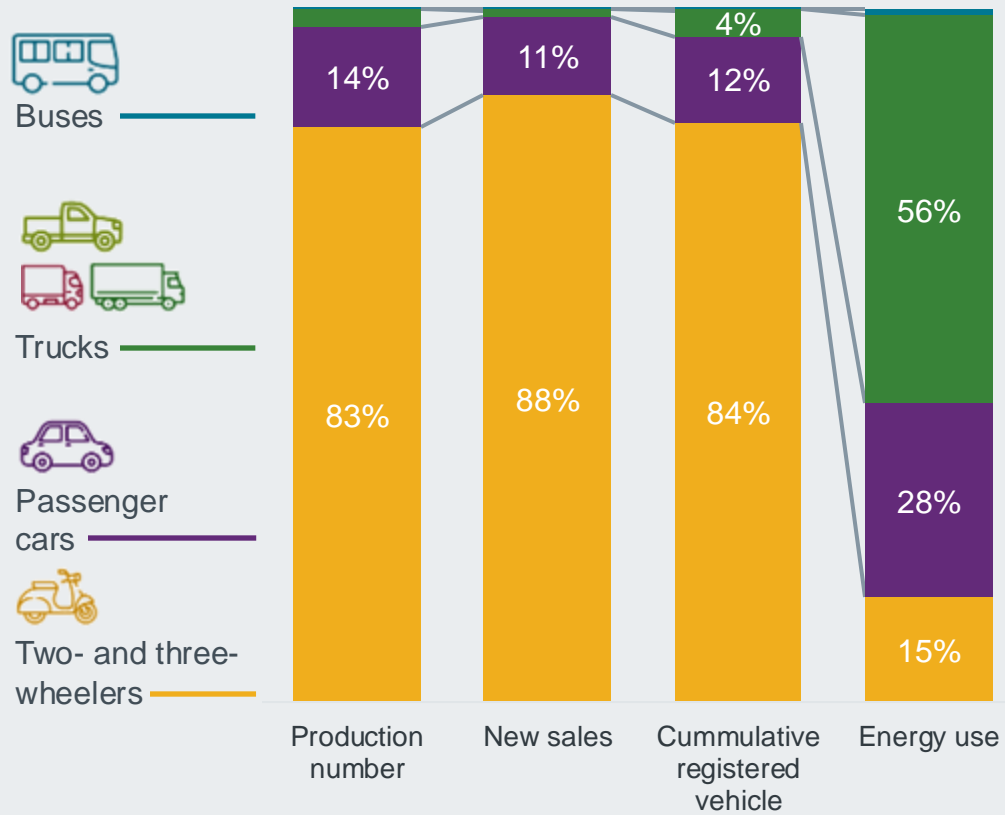
## Fiscal Burden:

Fuel subsidies for road transport drain IDR 200T annually from Indonesia's budget, consuming **10% of GDP** in 2023  
(The Financial Audit Board, 2024; Indonesia Statistics, 2024)

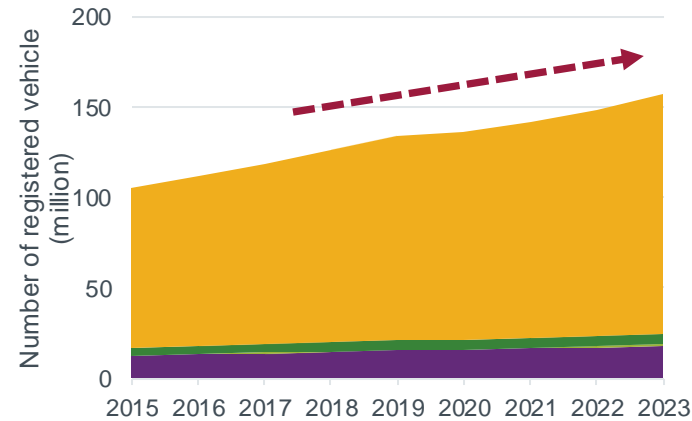


# Indonesia's Transportation Landscape: Scale of Transformation

## Indonesia road transport profile, 2023



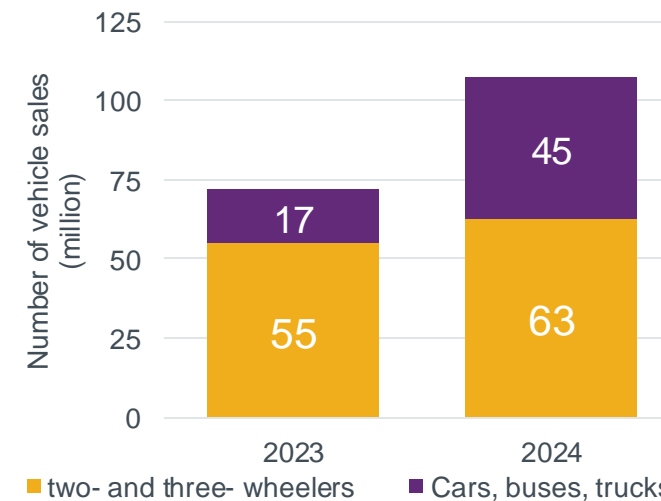
Source: Indonesia statistics (2024), Gaikindo (2024), Ministry of Energy and Mineral Resources (2024), Asian Automotive Analysis (2024).



Registered vehicles grow by an average of

**+5% p.a.**

Source: BPS (2024)



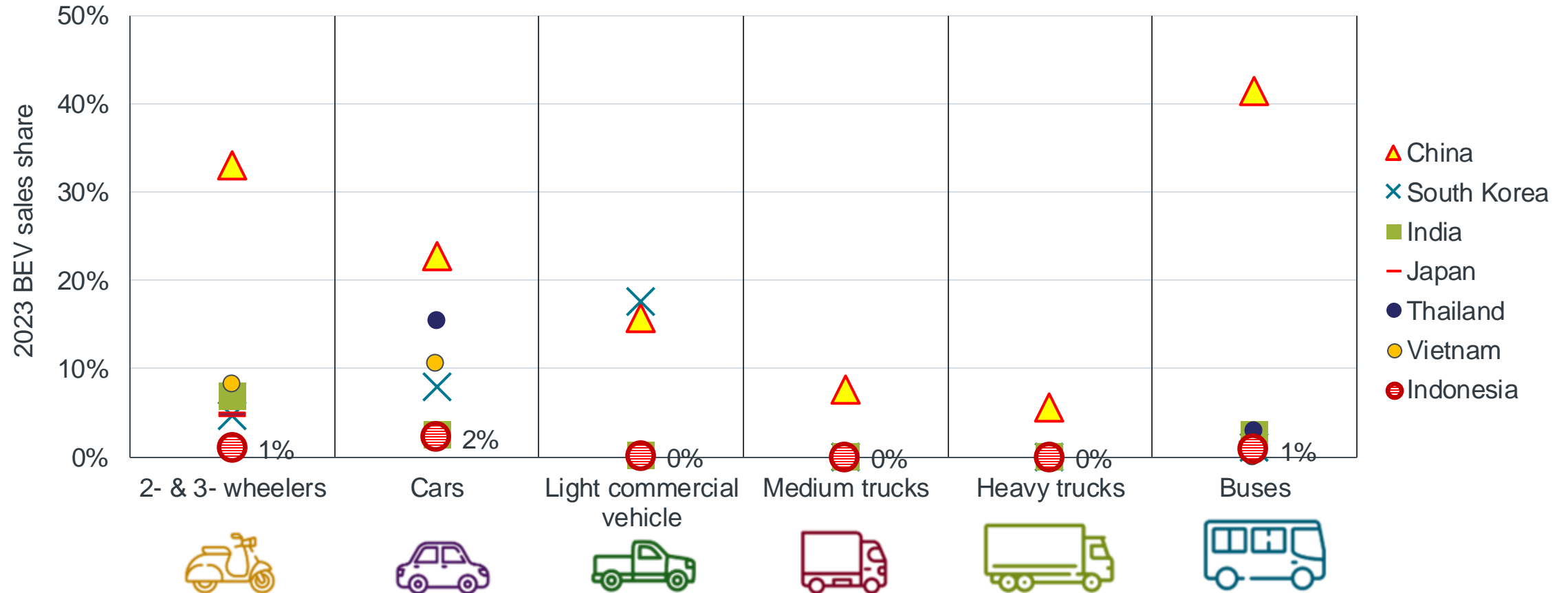
## BEV sales in 2024

**4%** For cars, buses, & trucks combined

**1%** two- and three-wheelers

Source: MOT (2024), Gaikindo (2024), AISI (2024)

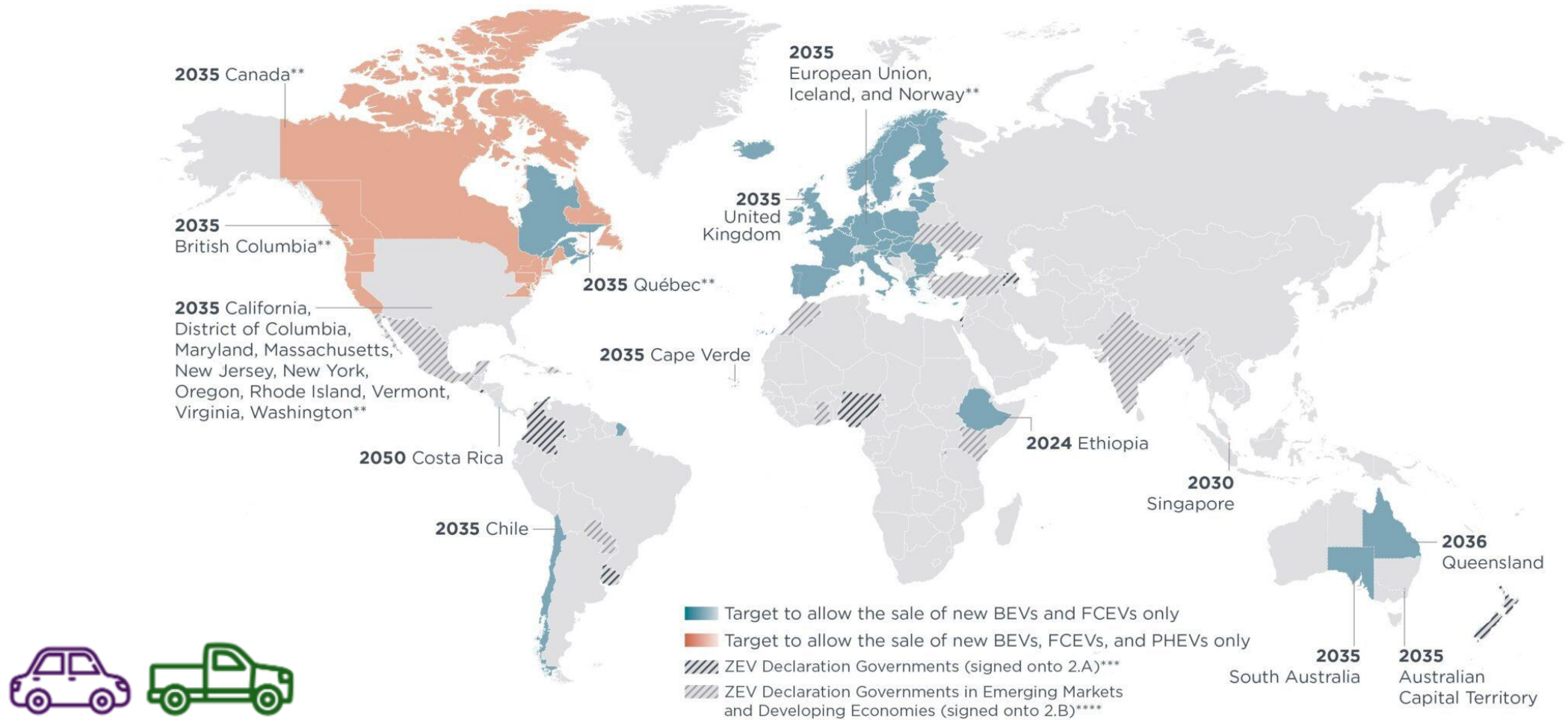
# Benchmarking Indonesia's ZEV Progress in Asia's Growing Market



Source: Sen, A., Teter, J., & Miller, J. (2025). Vision 2050: Update on the global zero-emission vehicle transition in 2024. The International Council on Clean Transportation.

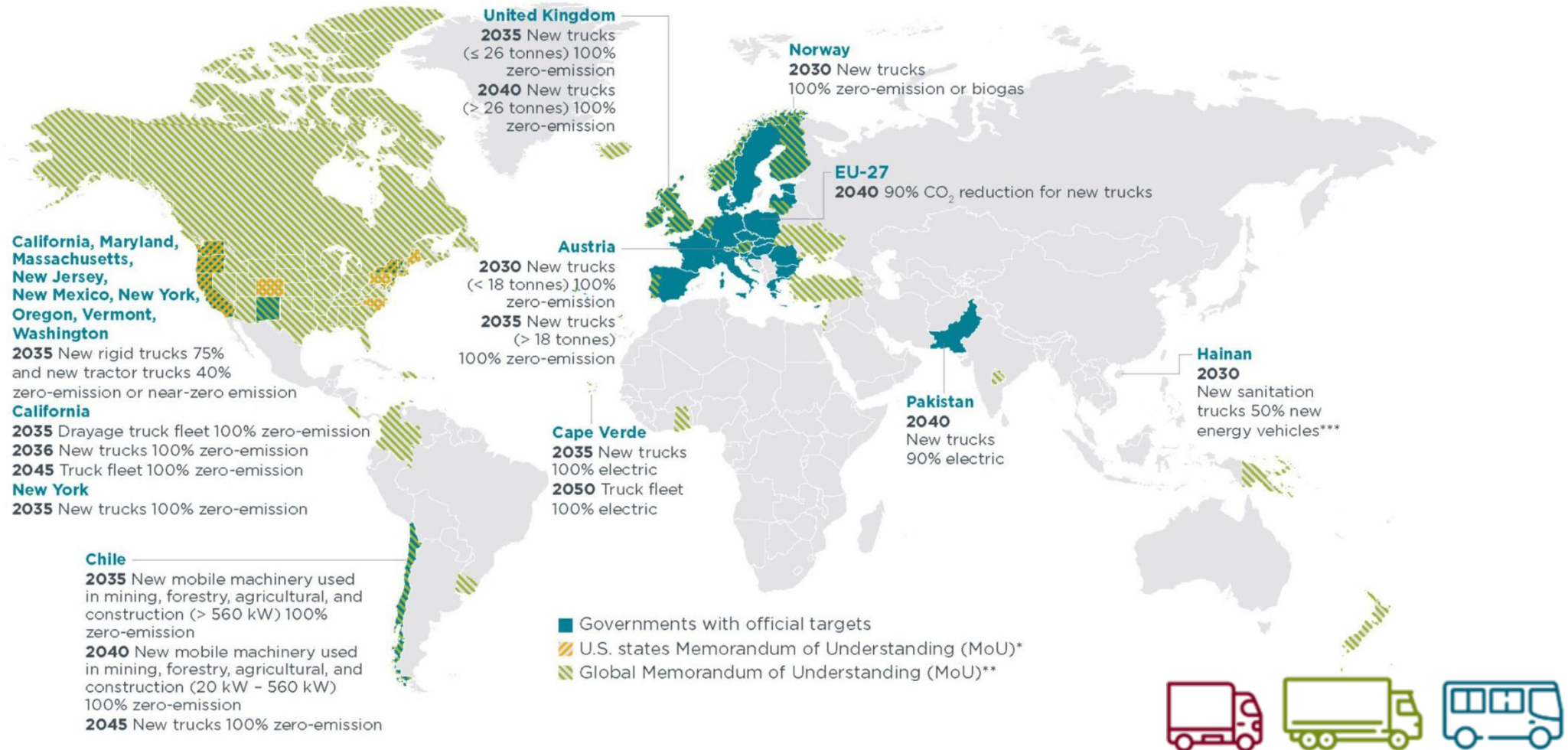


# Government with Official Targets to 100% ZEV Sales: Cars and Vans/Light Trucks



Status: Through July 2024  
 Source: <https://theicct.org/zero-emission-vehicle-phase-ins-passenger-cars-and-vans-light-trucks-july-2024/>

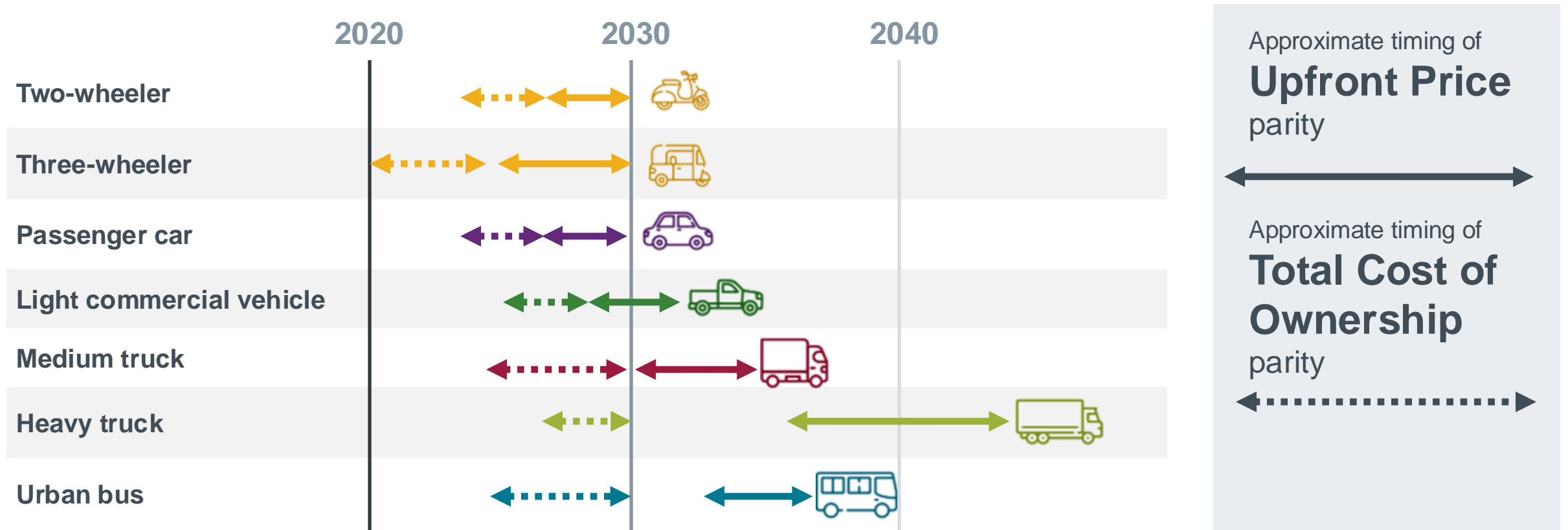
# Government with Official Targets to 100% ZEV Sales: Medium- and Heavy-Duty Trucks



Status: Through July 2024  
<https://theicct.org/zev-phase-ins-hdvs-july-2024-jul24/>

# Indonesia's transition unfold differently for each vehicle category

Estimated timing of first-owner TCO parity and upfront price parity without subsidy for different vehicle types in Indonesia



Miller, J., Syahputri, J., Hall. Dale., Mahalana. A., Posada. F., (2024). Roadmap to zero: The pace of Indonesia's electric vehicle transition. International Council on Clean Transportation.



# ZEV Transition Trajectories: Calculation and Classification



**Two- and three- wheelers**



**Passenger cars**  
(GVW<3.5t)



**Urban and coach buses**  
(GVW≥3.5t)



**Light commercial vehicles**  
(GVW<3.5t)



**Medium-duty trucks**  
(GVW 3.5–15t)



**Heavy-duty trucks**  
(GVW>15t)

# Trajectories for the ZEV Transition by Vehicle Type: Net zero trajectory

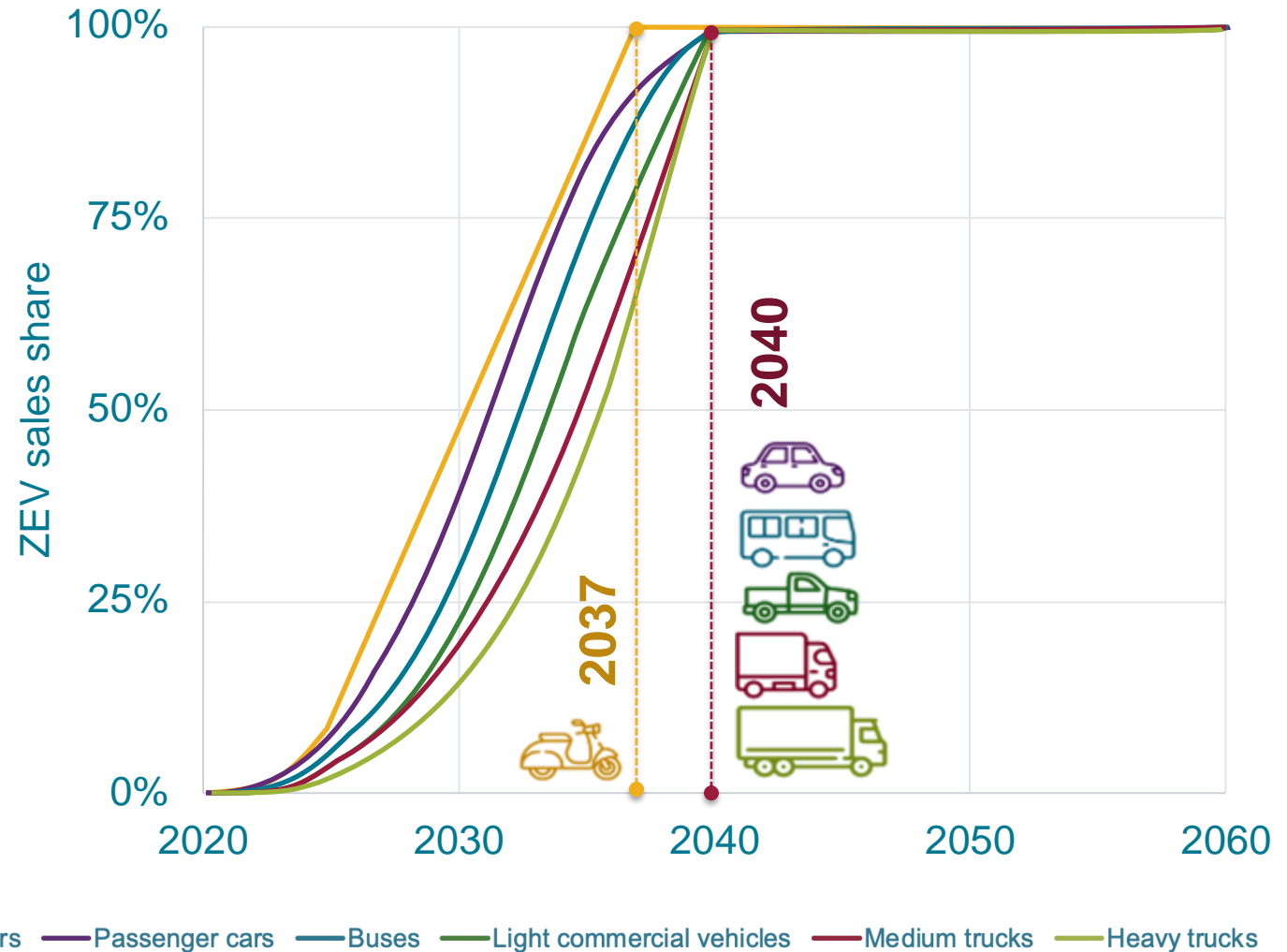
## Trajectories

- 1 Net zero
- 2 Reference



**A** The Best Practice scenario

**B** The Net Zero scenario



Miller, J., Syahputri, J., Hall. Dale., Mahalana. A., Posada. F., (2024). Roadmap to zero: The pace of Indonesia's electric vehicle transition. International Council on Clean Transportation.

# Trajectories for the ZEV Transition by Vehicle Type: Net zero trajectory

## Trajectories

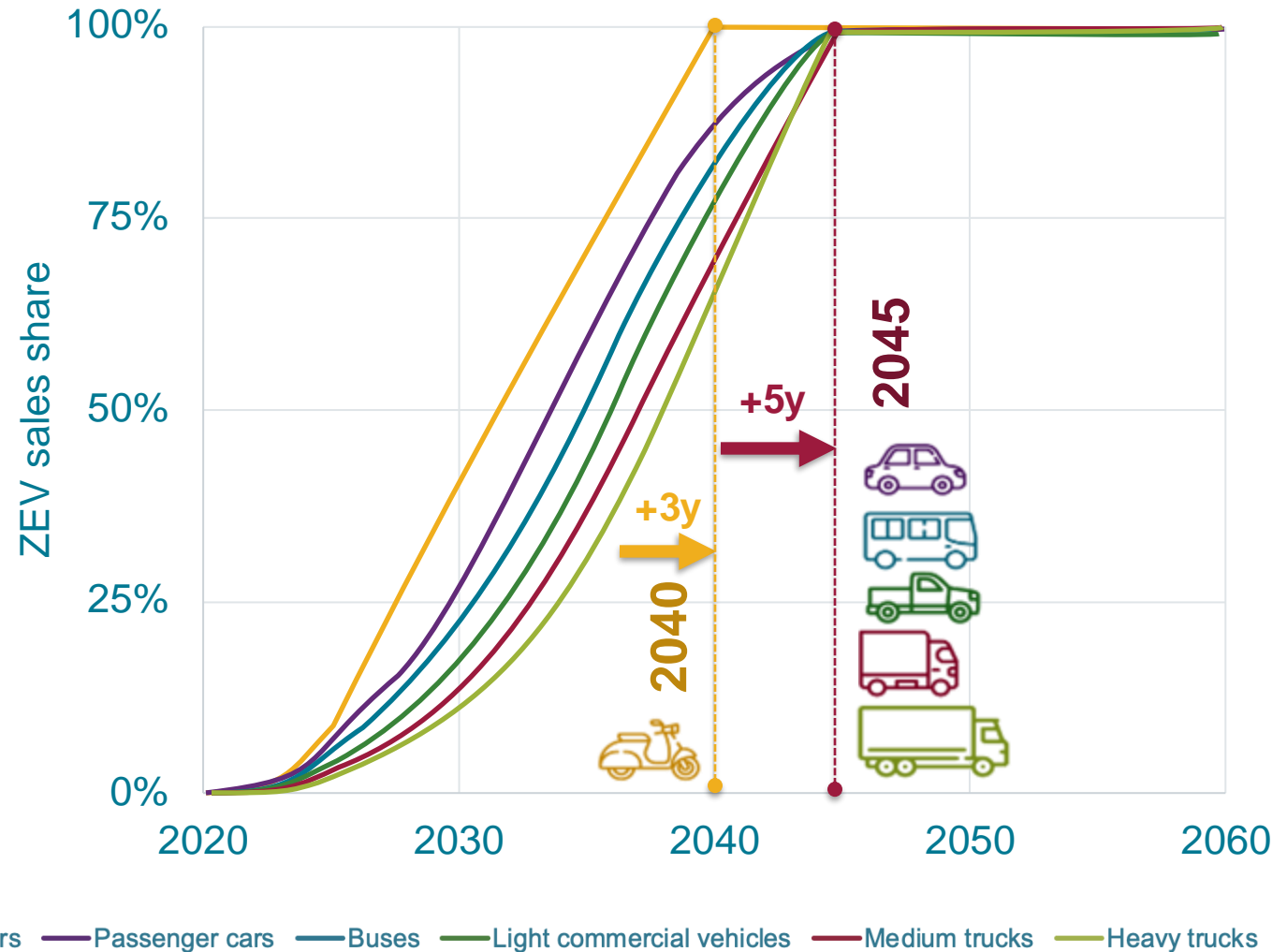
1 Net zero

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A The Best Practice scenario

B The Net Zero scenario



Miller, J., Syahputri, J., Hall. Dale., Mahalana. A., Posada. F., (2024). Roadmap to zero: The pace of Indonesia's electric vehicle transition. International Council on Clean Transportation.

# Trajectories for the ZEV Transition by Vehicle Type: Reference trajectory

## Trajectories

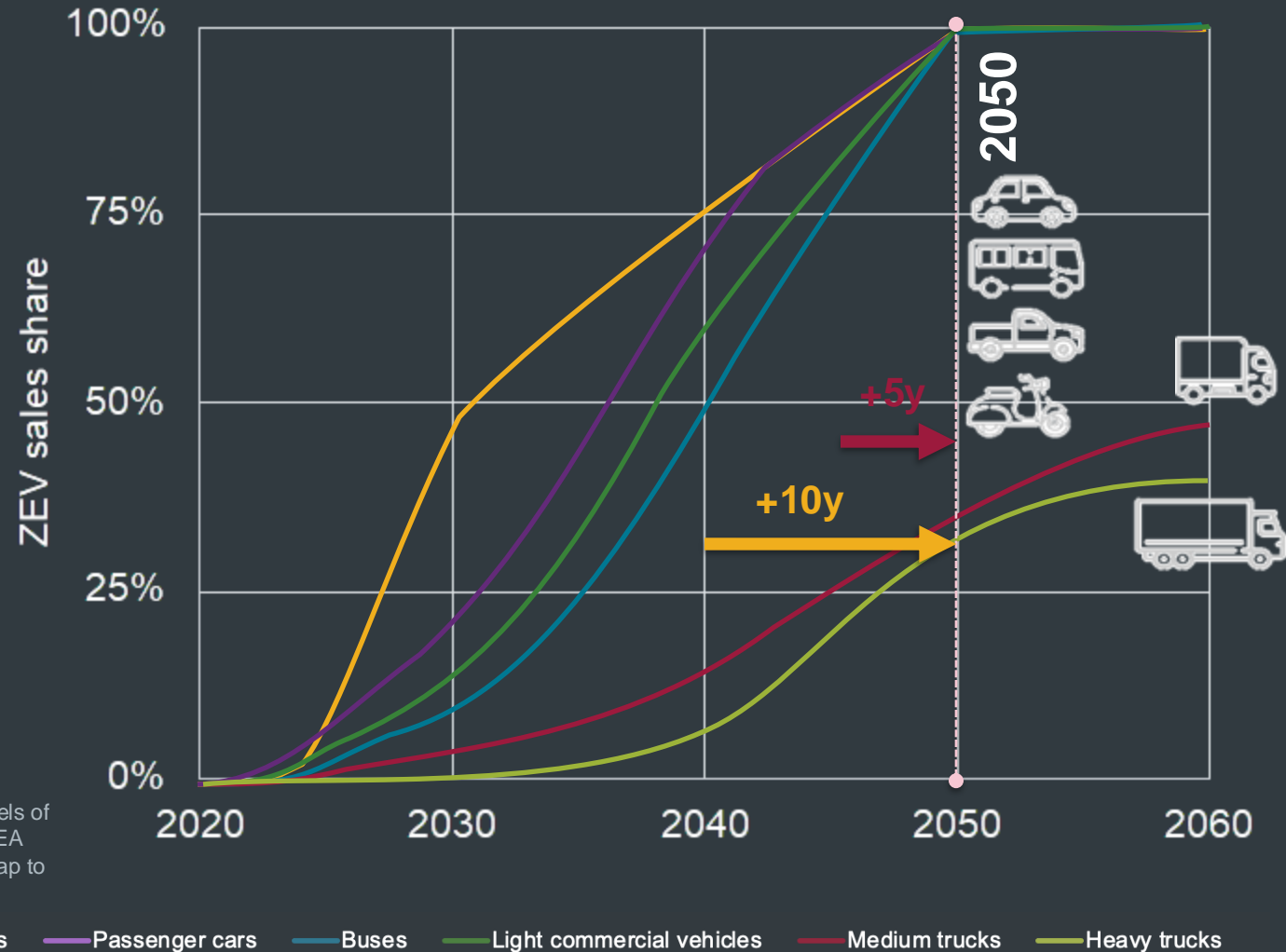
1 Net zero

2 Reference



**A** The Announced Targets 2050 scenario

**B** The Reference scenario



The reference and Announced Targets 2050 scenarios are generally consistent with the levels of ZEV uptake in the STEPS and APS from the IEA MEMR 2022 report, An Energy Sector Roadmap to NZE in Indonesia

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# Trajectories for the ZEV Transition by Vehicle Type: Reference trajectory

## Trajectories

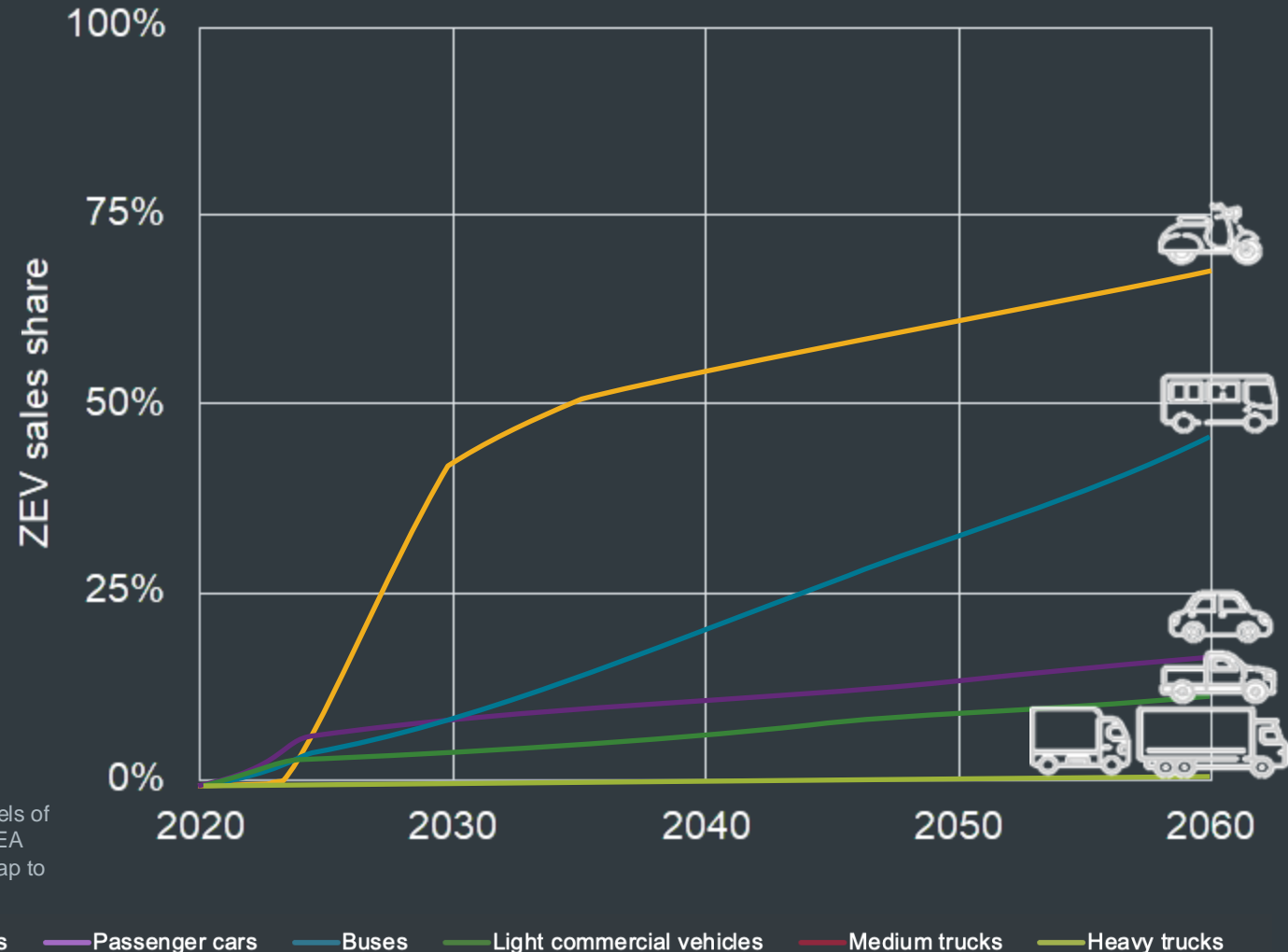
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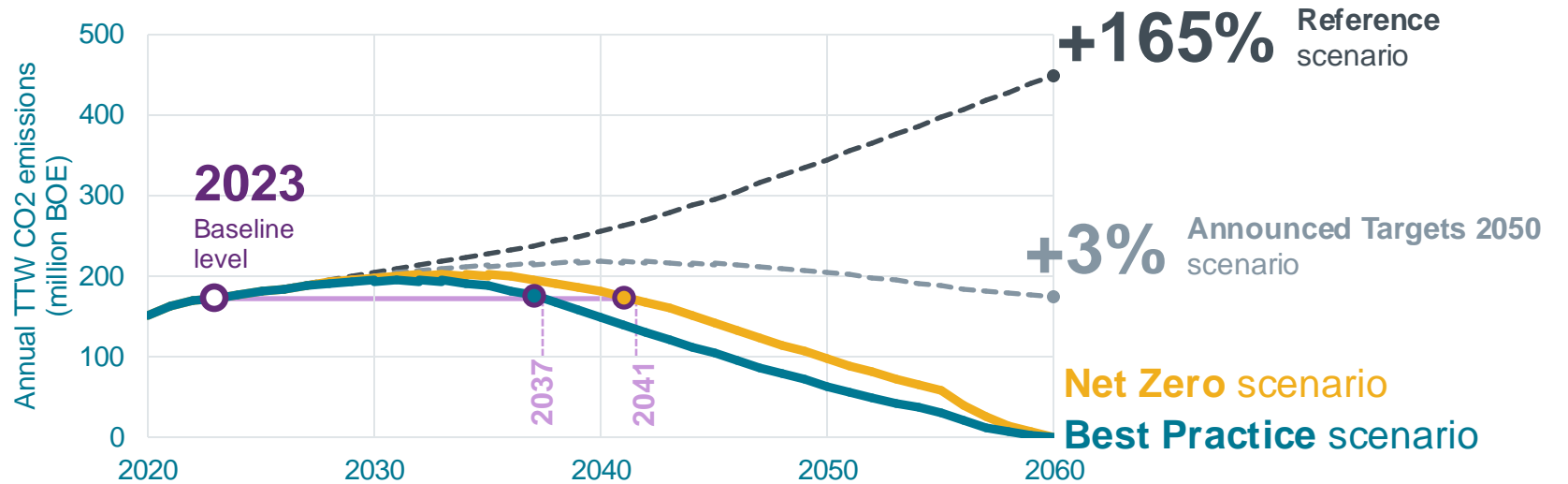
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Miller, J., Syahputri, J., Hall. Dale., Mahalana. A., Posada. F., (2024). Roadmap to zero: The pace of Indonesia's electric vehicle transition. International Council on Clean Transportation.



# Indonesia Needs More Ambitious Pathway to Achieve Net Zero Road Transport Emissions 2060

Annual tank-to-wheel CO<sub>2</sub> emissions in million tones



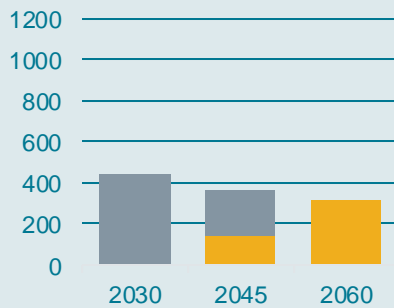
## Energy Consumption in million BOE

Electricity

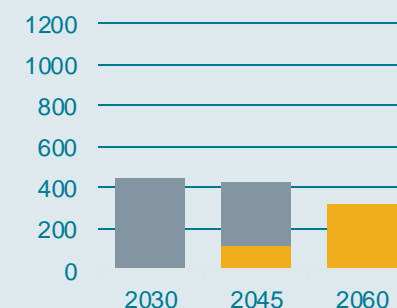
Liquid fuels

### Net zero scenarios

#### Best Practice

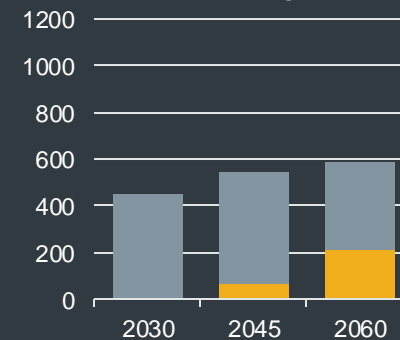


#### Net Zero

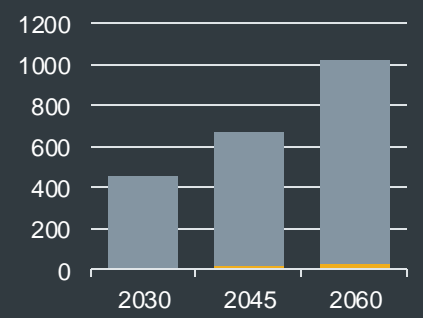


### Reference scenarios

#### Announced Targets 2050



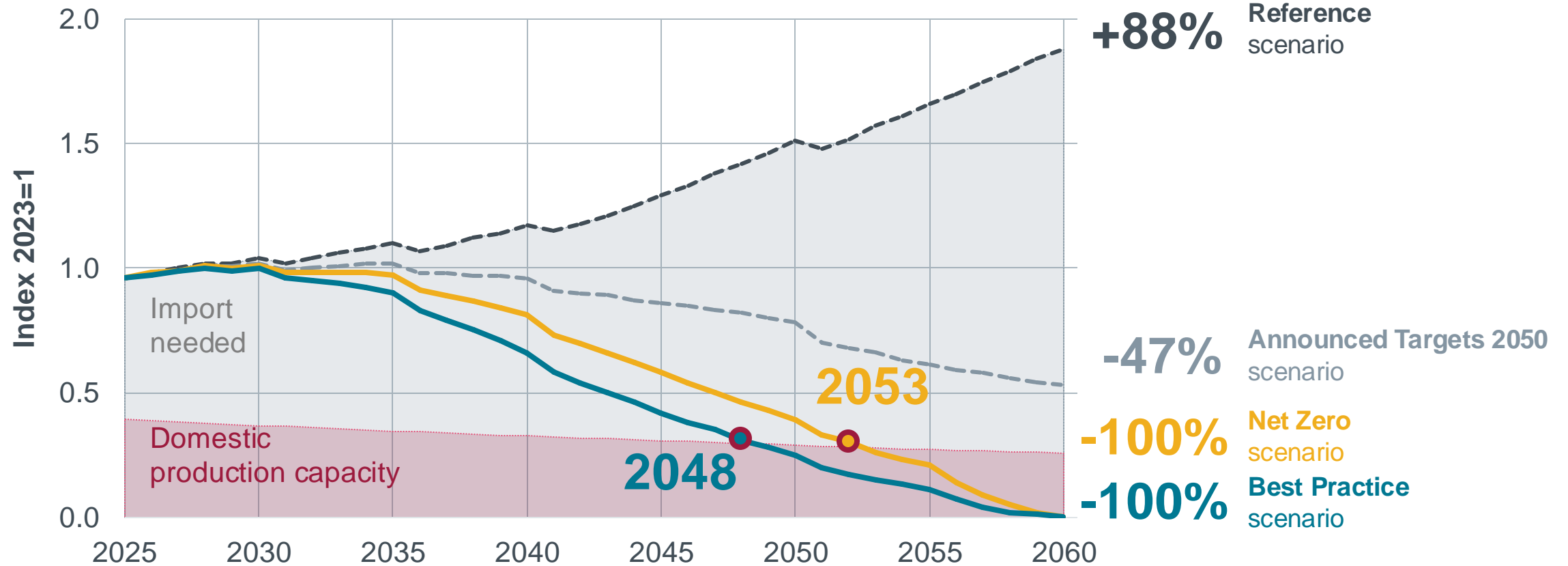
#### Reference



Miller, J., Syahputri, J., Hall. Dale., Mahalana. A., Posada. F., (2024). Roadmap to zero: The pace of Indonesia's electric vehicle transition. International Council on Clean Transportation.

# ZEV Uptake can Potentially Solve Reliance on Fossil Fuel Imports and Lift Fiscal Burden

Fossil fuel for road transport relative to 2023 consumption

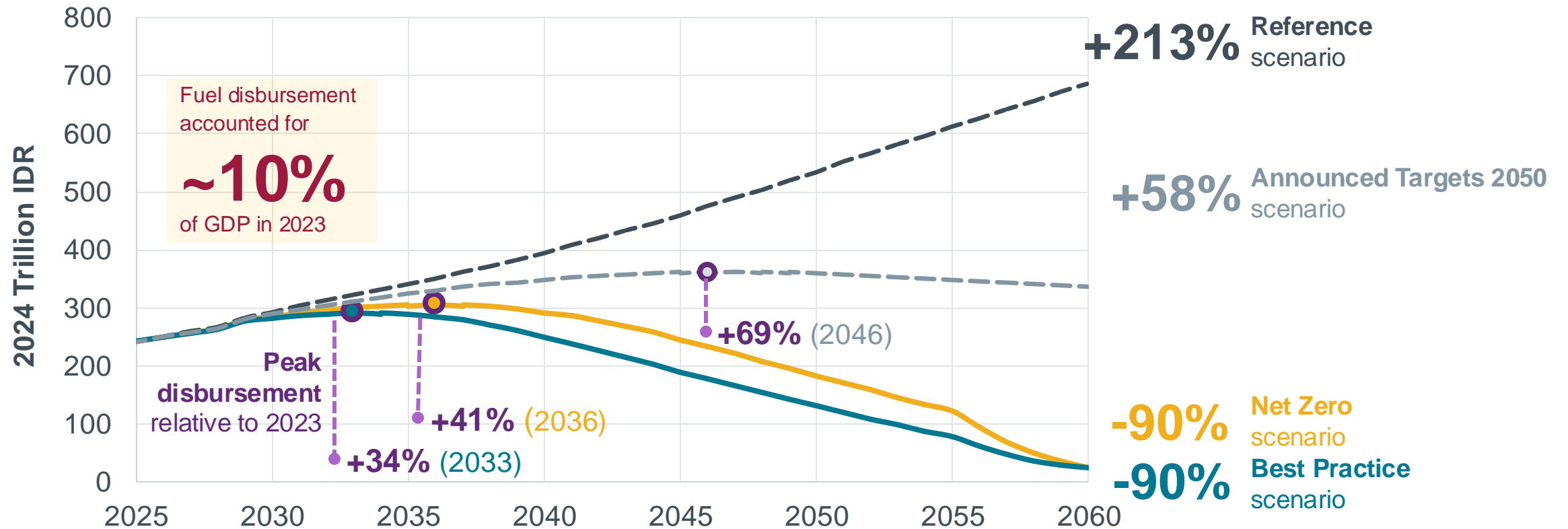


**Note:** Domestic production capacity is based on 2023 data in which domestically produced fossil fuels accounted for the other 40%, with production declining by 1.2% per year

Miller, J., Syahputri, J., Hall. Dale., Mahalana. A., Posada. F., (2024). Roadmap to zero: The pace of Indonesia's electric vehicle transition. International Council on Clean Transportation.

# ZEV Uptake can Potentially Solve Reliance on Fossil Fuel Imports and Lift Fiscal Burden

**Potential Avoided Energy Disbursement**  
in Trillion IDR (percentage shown relative to 2023 disbursement)



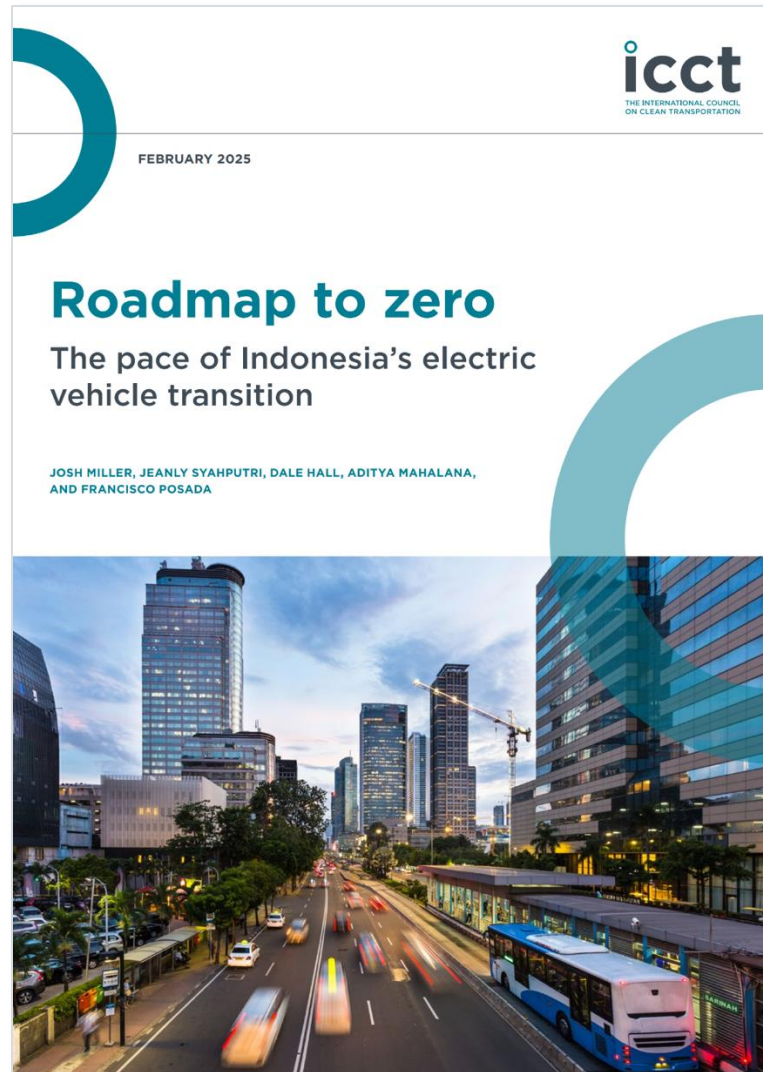
**Note:** Using 2024 IDR1000/liter subsidy for subsidized diesel grade; IDR 3,966/L and IDR 1,596/L compensation for diesel and gasoline, respectively; IDR 5,491/L for blended fuel; IDR 1,000/kWh for electric two- and three- wheelers only.

Miller, J., Syahputri, J., Hall. Dale., Mahalana. A., Posada. F., (2024). Roadmap to zero: The pace of Indonesia's electric vehicle transition. International Council on Clean Transportation.

# 4 Key ZEV Policy Recommendations

**1 Update ZEV Targets**  
Align with 100% ZEV sales by 2037-2040 (2W) and 2040-2045 (other vehicles) to maximize benefits and reduce scrappage program needs

**2 Expand Fiscal Support**  
Implement broad early-stage incentives, transitioning to targeted support funded by transport emissions revenue



**3 Adopt Supply Side Standards**  
Set progressive minimum sales shares for zero-emission vehicles and efficiency standards for other vehicles to drive industry investment with minimal government cost

**4 Deploy Charging Infrastructure**  
Create comprehensive plans and invest in EV charging infrastructure

Thank you  
Ray@theicct.org

