

Light Electric Vehicles: Asia and the Pacific Regional Context

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Light Electric Vehicles (LEVs) in the Philippines
Types and related Infrastructure, Policies and Operations



Asian Transport Observatory

Strengthening the knowledge base of transport in Asia-Pacific

A leading platform that gathers and shares comprehensive datasets, generate unique policy insights, and delivers novel knowledge products rooted in groundbreaking analysis.

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ATO National Transport Policy Documents Database

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ATO Urban Database

Explore more than 260 urban level transport indicators across nine categories



ATO Cost Database

Explore more than 1,300 transport-related projects and benchmark their costs within subregions or income groups in Asia and the Pacific

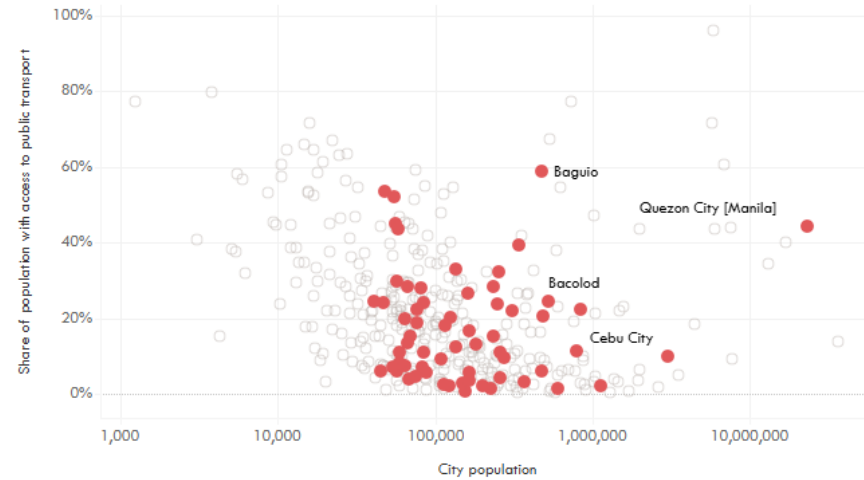


ATO Analytical Outputs

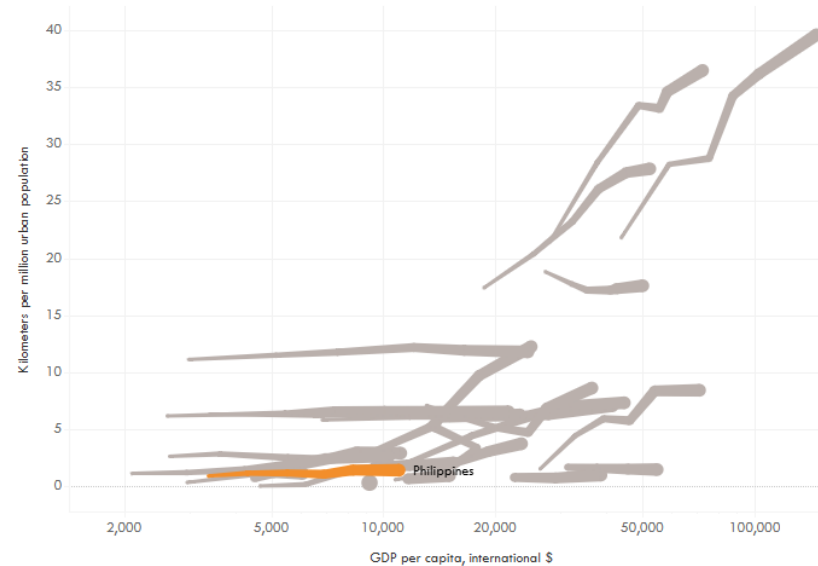
Read about analysis made using ATO transport data and policy information

Context

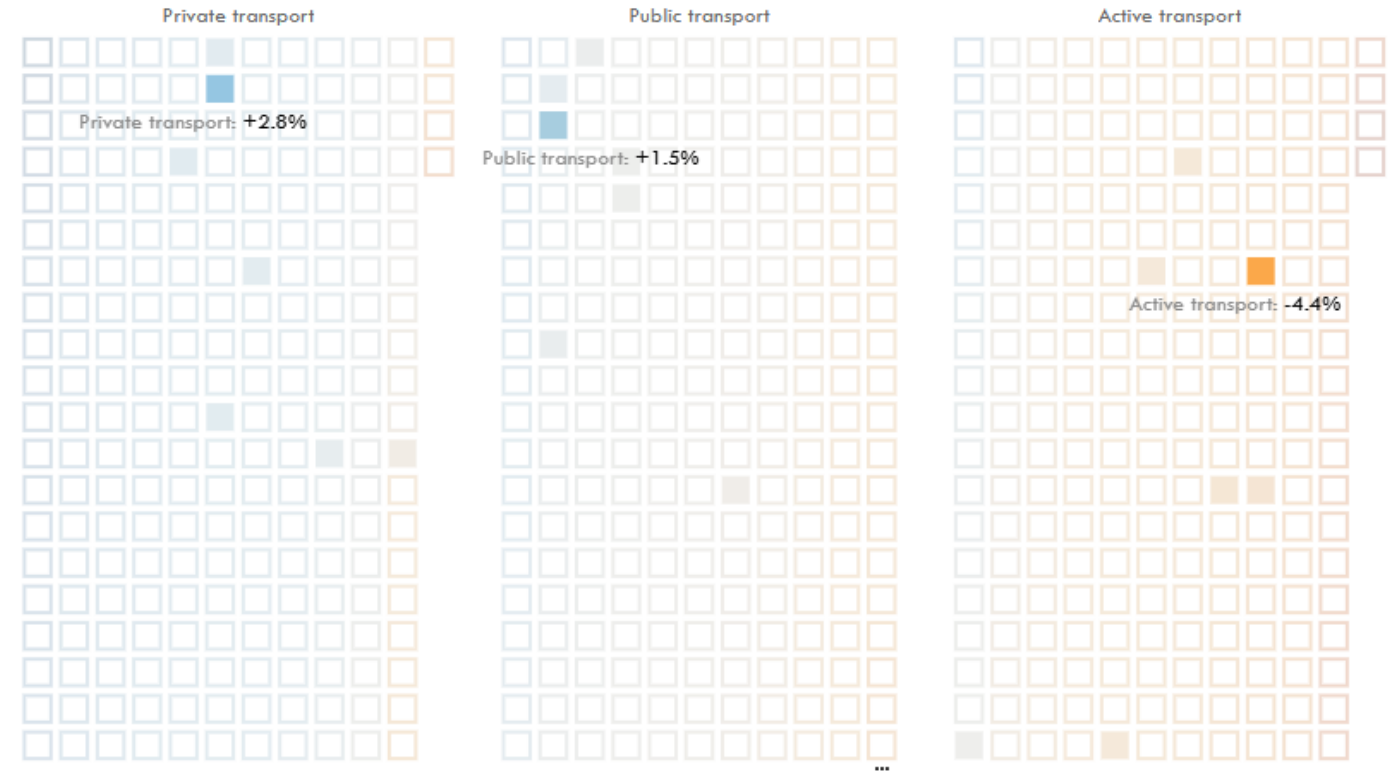
Access to public transport



Urban rapid transit availability per capita



Modal shift in cities



<https://asiantransportobservatory.org/analytical-outputs/transportclimateprofiles/philippines-transport-and-climate-profile-2026/>

<https://asiantransportobservatory.org/analytical-outputs/countryprofiles/profile-philippines/>

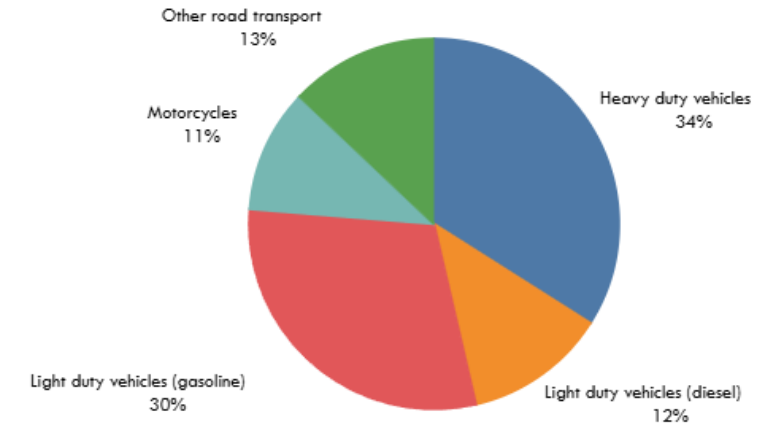
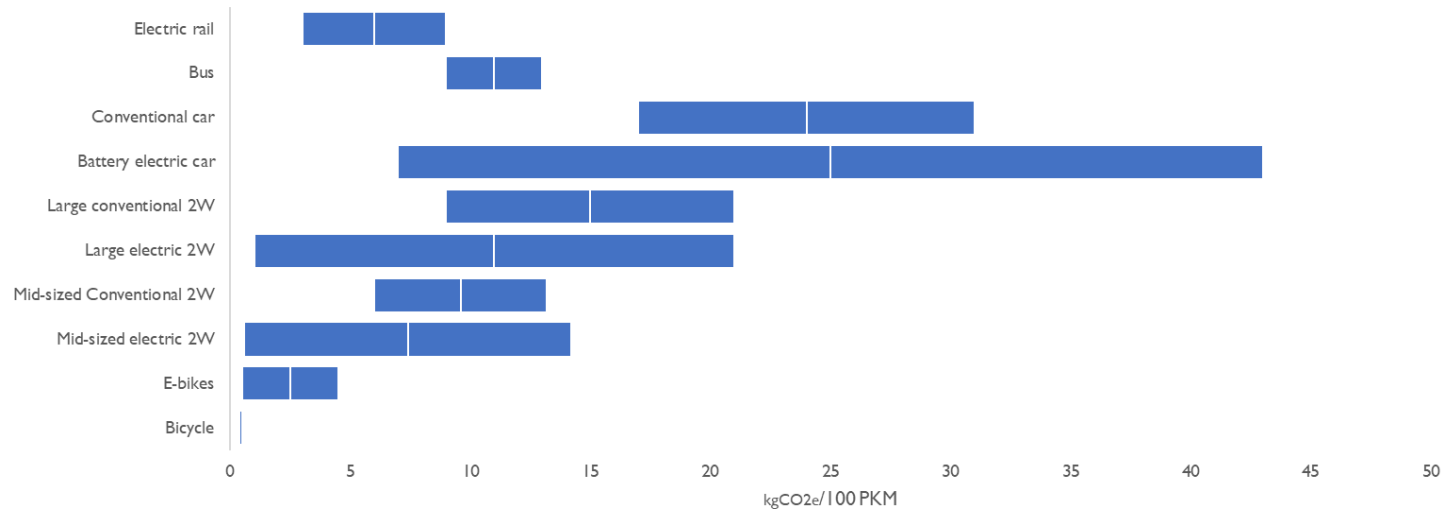
<https://asiantransportobservatory.org/insights/urban-access-to-public-transportation-visualization/>

Transport GHG Emissions

Transport GHG per Capita and GDP per Capita (2000-2024)

Road transport CO2 emissions, share by mode

Lifecycle Emissions



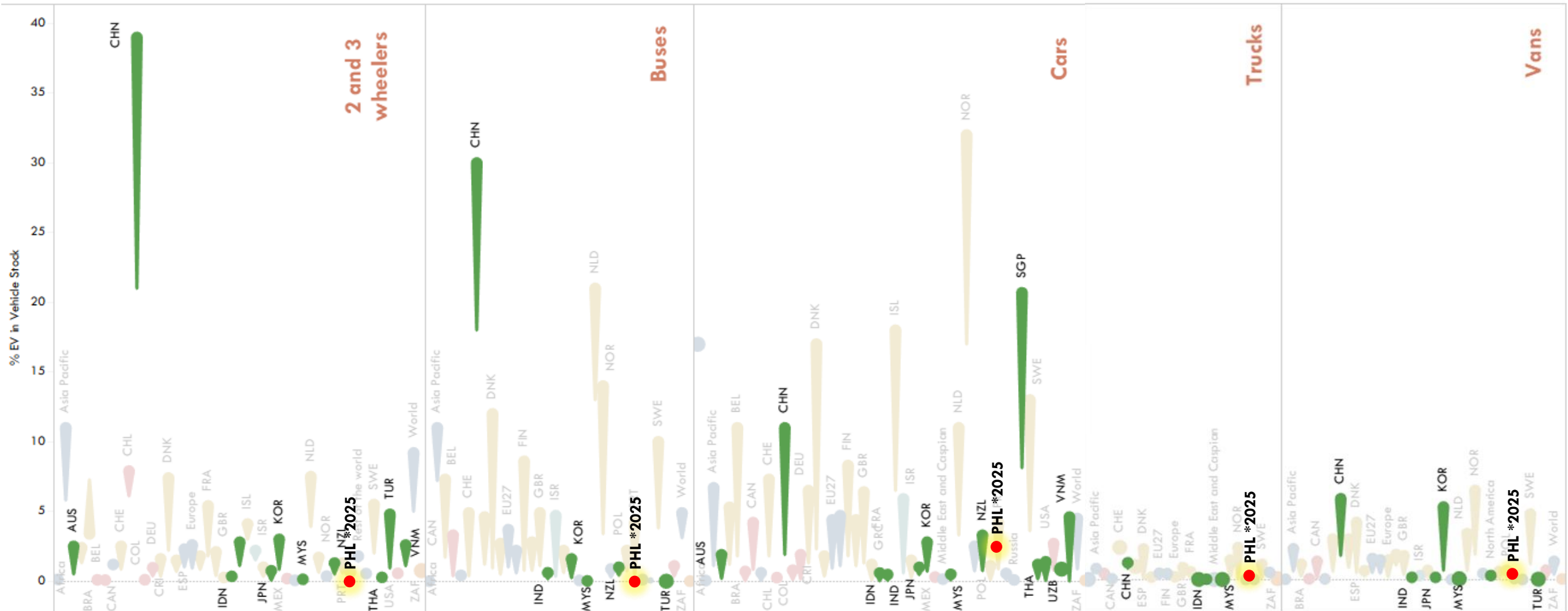
Source: IIASA (2025)

Source: ATO analysis and visualization based on JRC & IEA (2025) and World Bank (2025)

Own visualization based on Weiss et al. (2015)

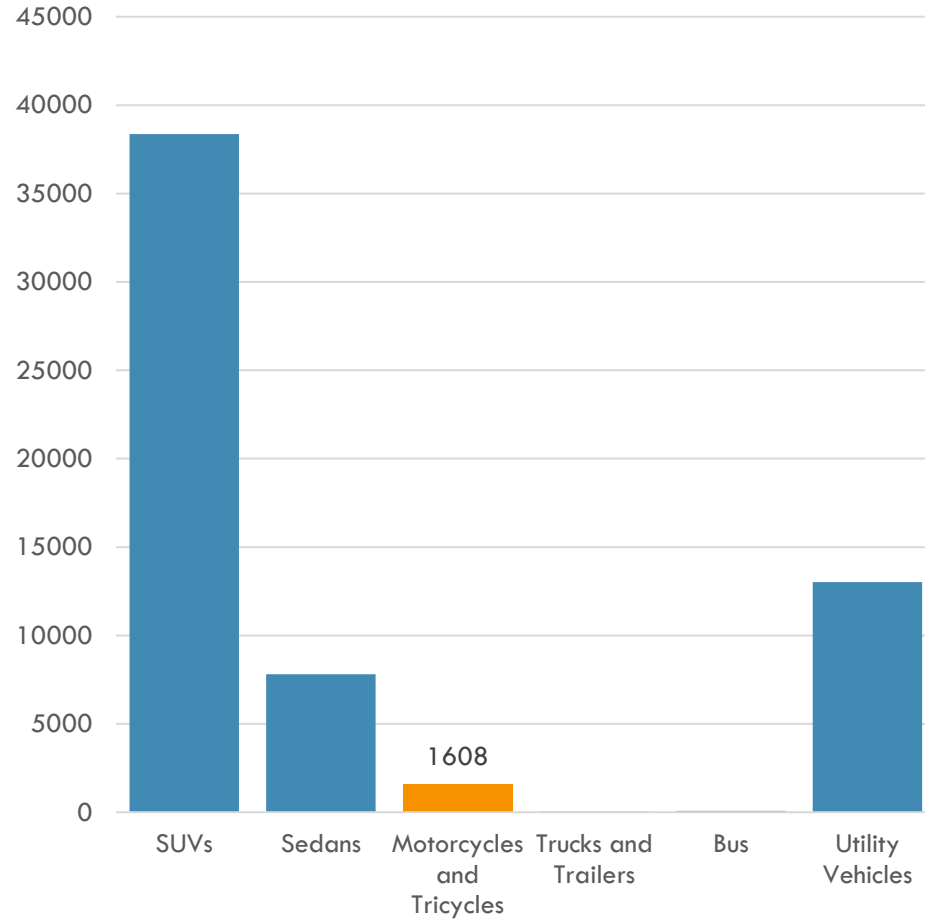
EV Penetration Rates

EV % in Vehicle Stock by Vehicle Type 2000 and 2024 ; Estimated PHL 2025

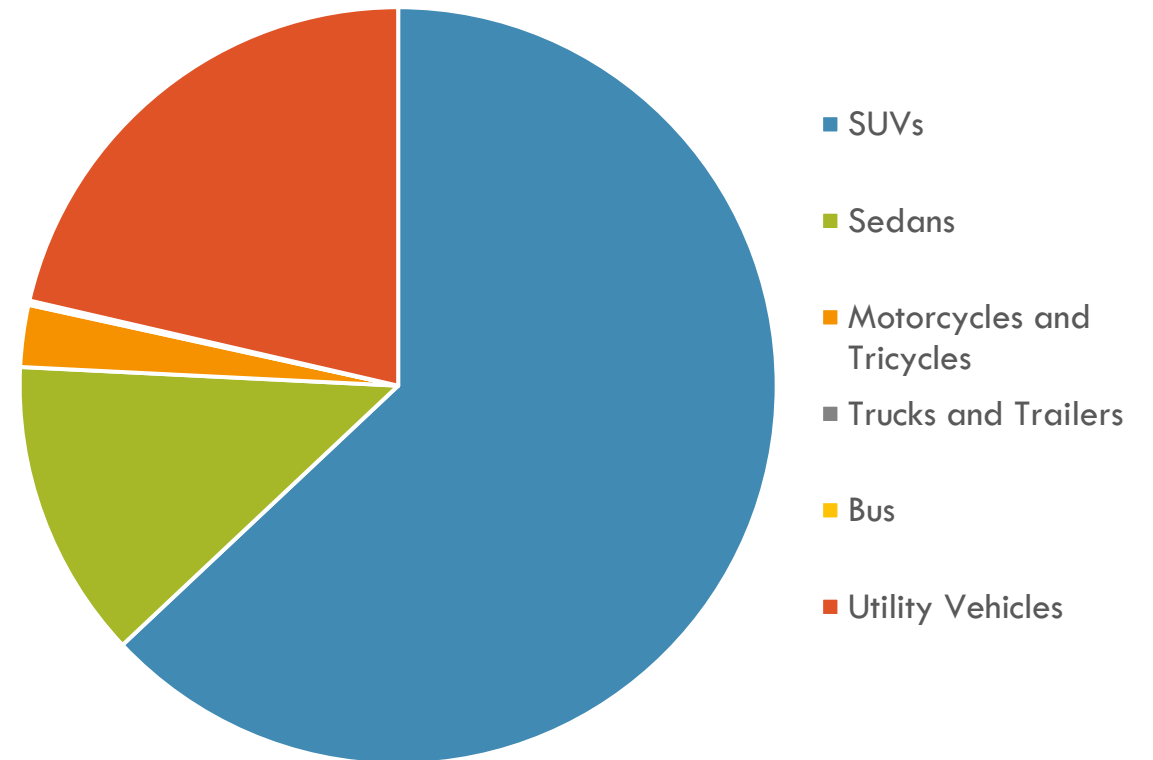


PHL EVs

Total EVs 2025

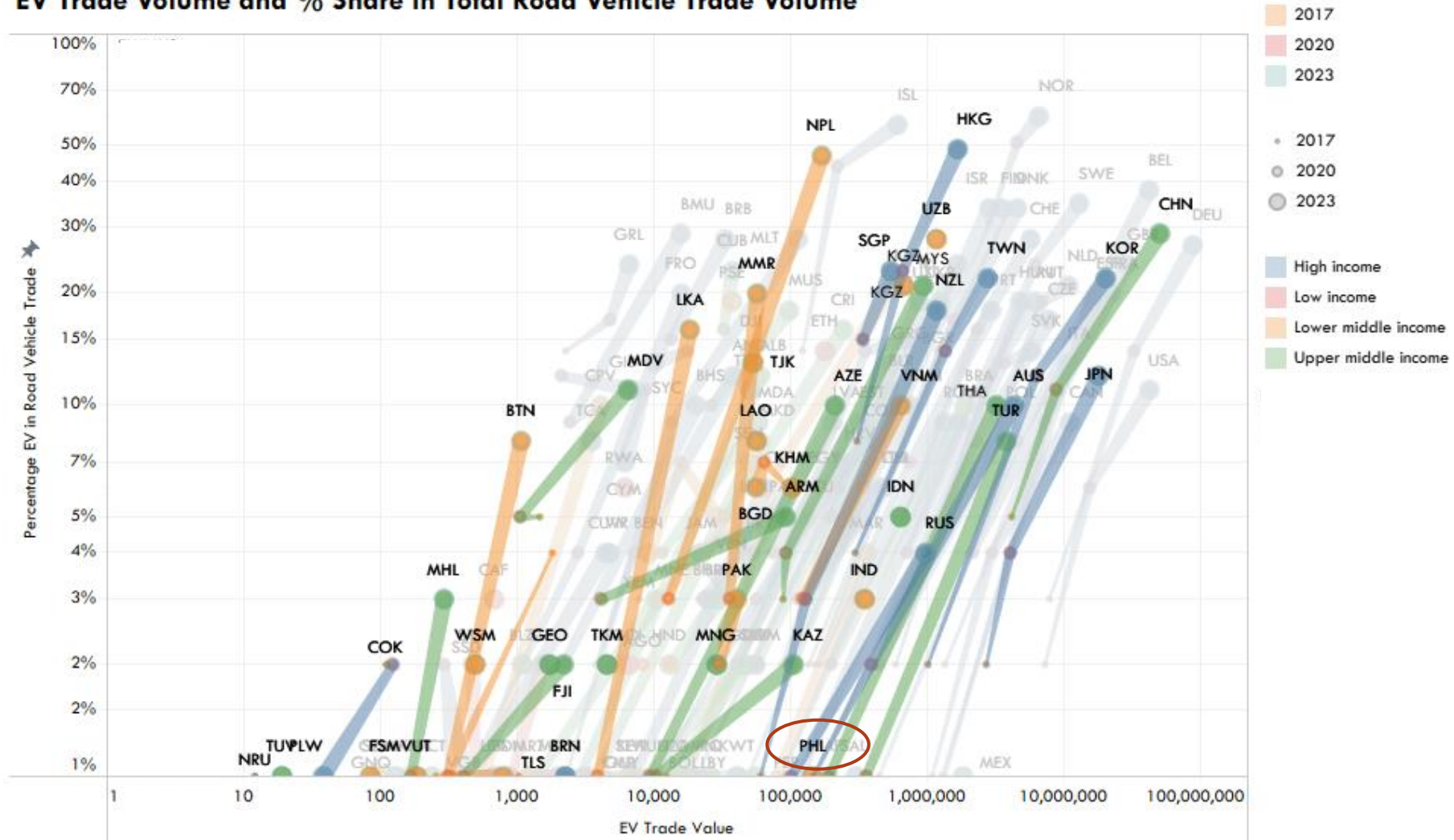


% by Vehicle Type - EVs 2025

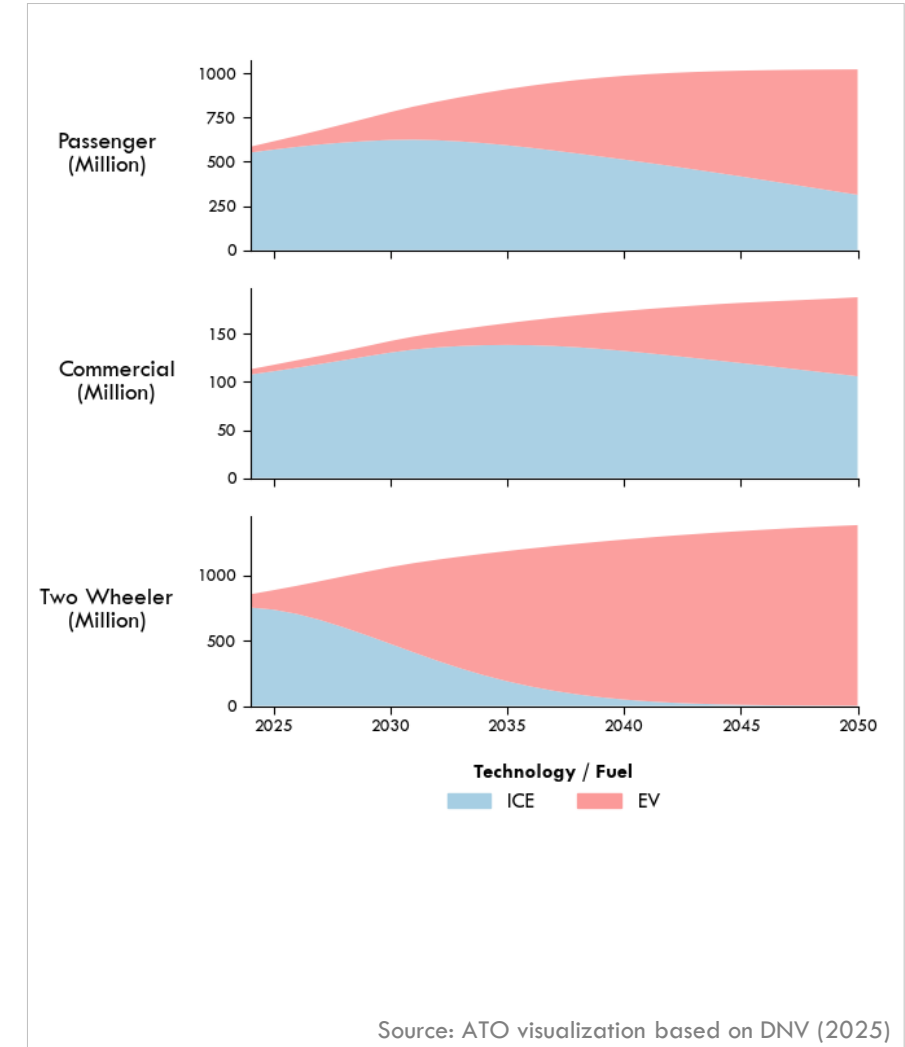
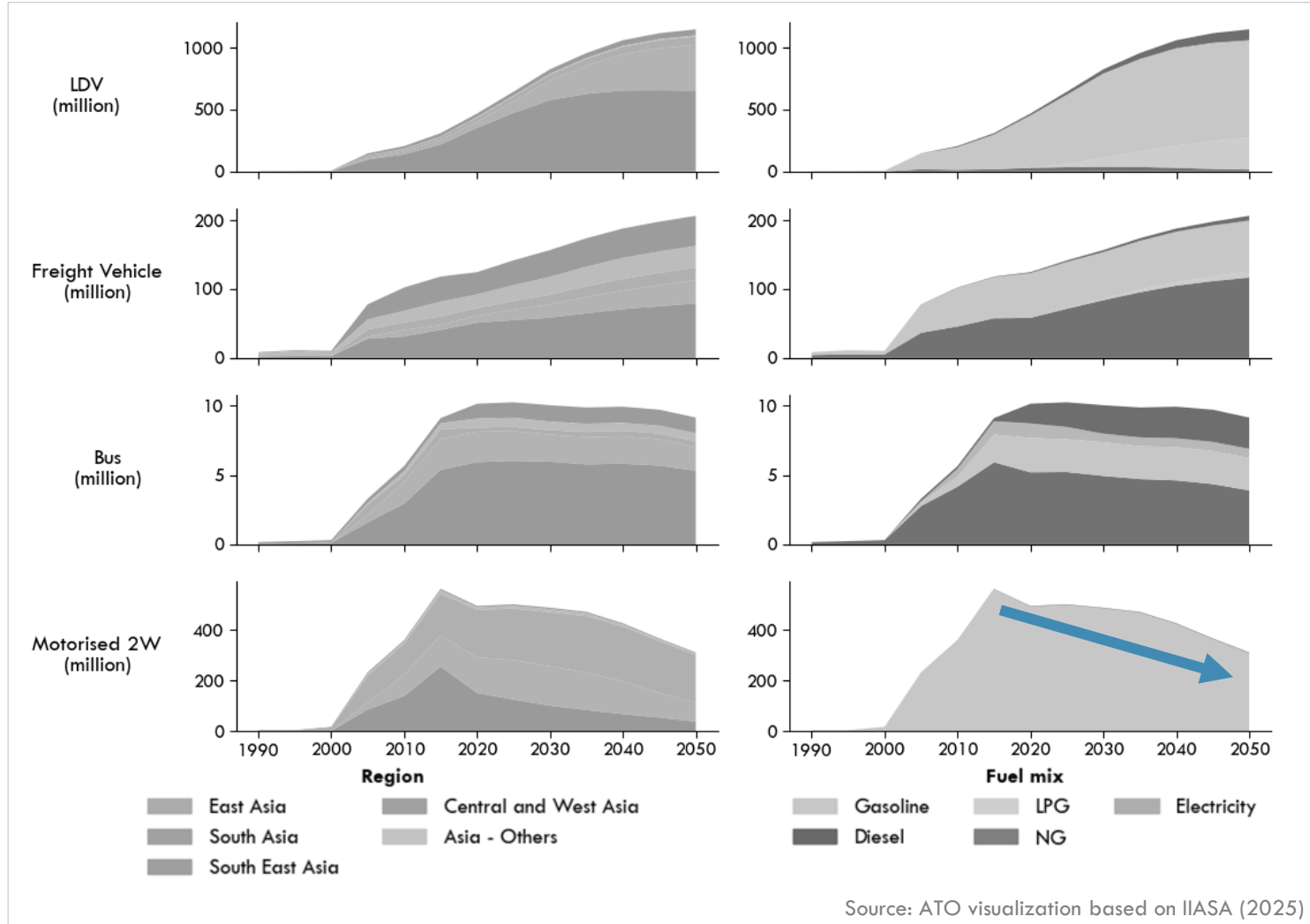


Trade – Electric Vehicles

EV Trade Volume and % Share in Total Road Vehicle Trade Volume

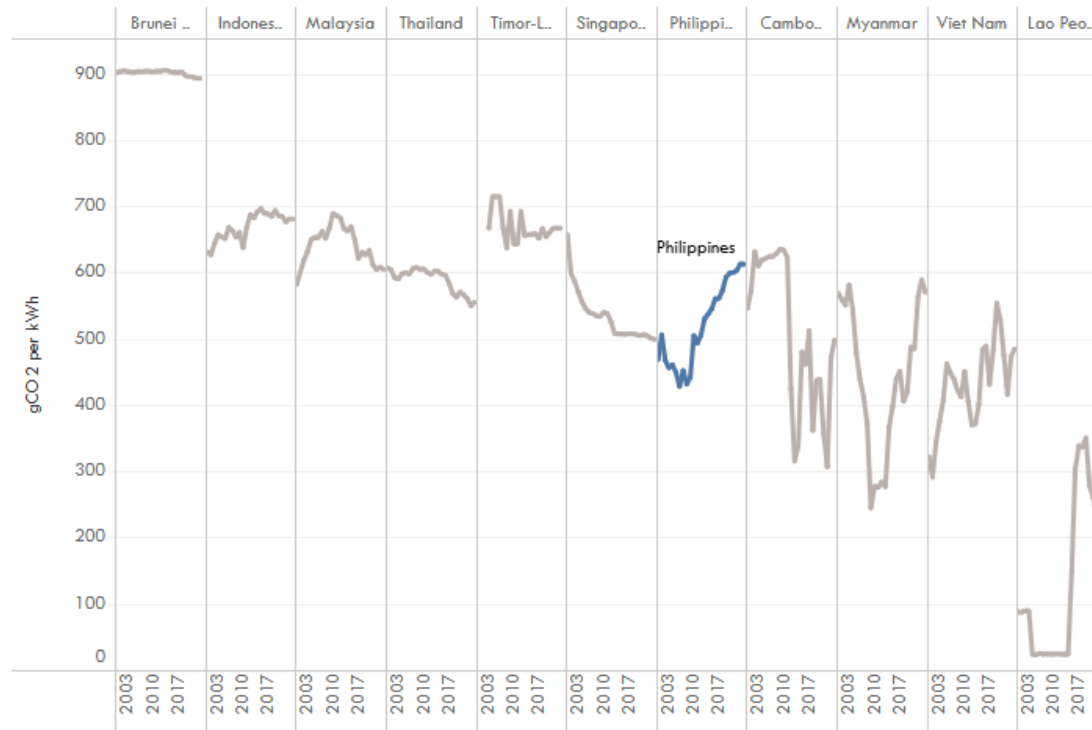


Vehicle Stock Projections



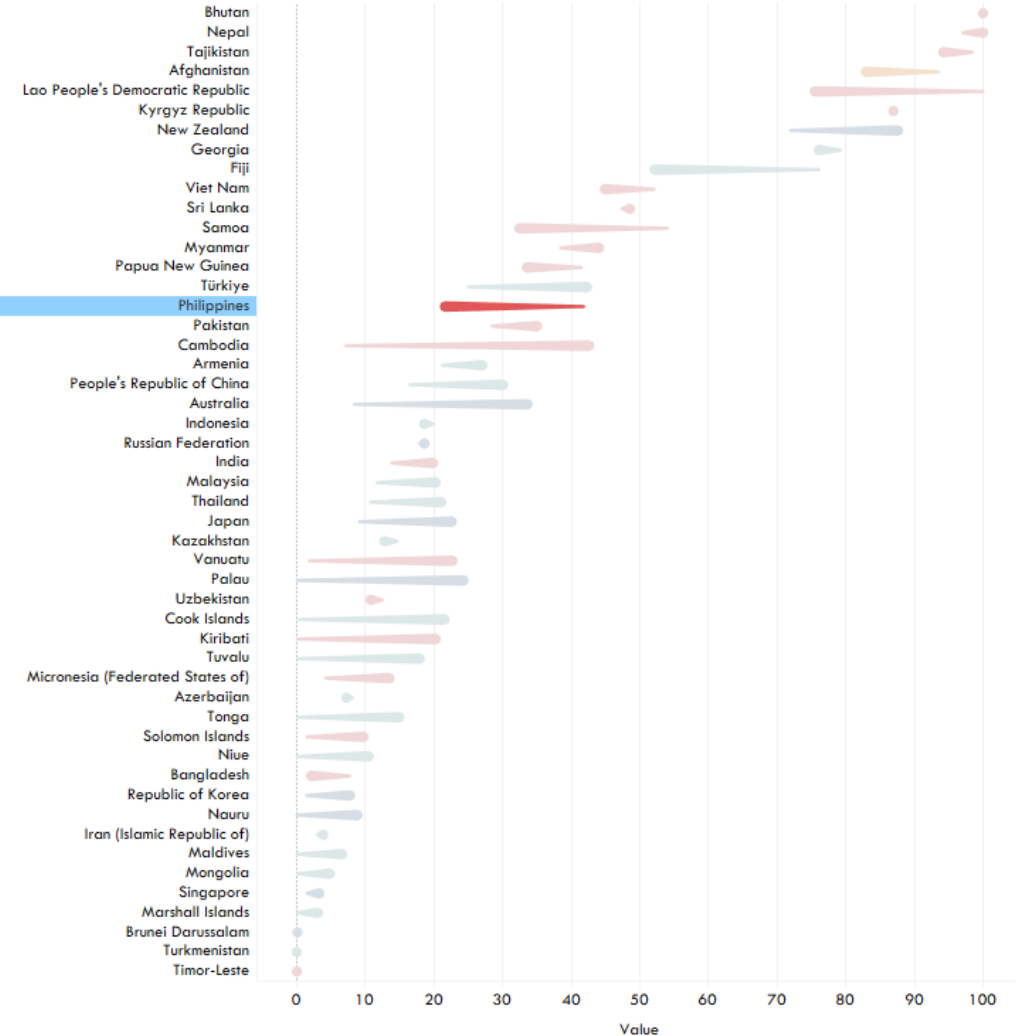
CO2 Emission Factors – Electricity Grids

Grid emission factor



Source: Ember (2024)

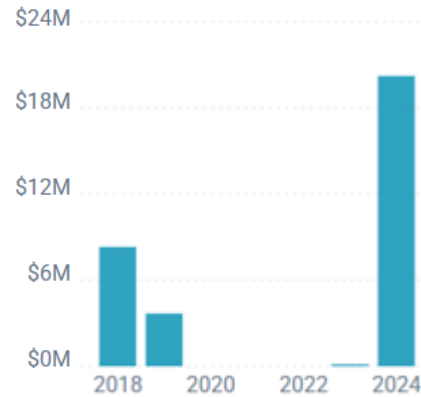
Percentage of Renewable Energy in Electricity Generation



Development Finance → PHL E-mobility

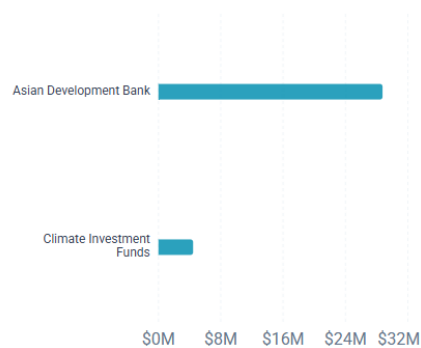
Development Finance over Time

Disbursements by year, constant 2024 USD.



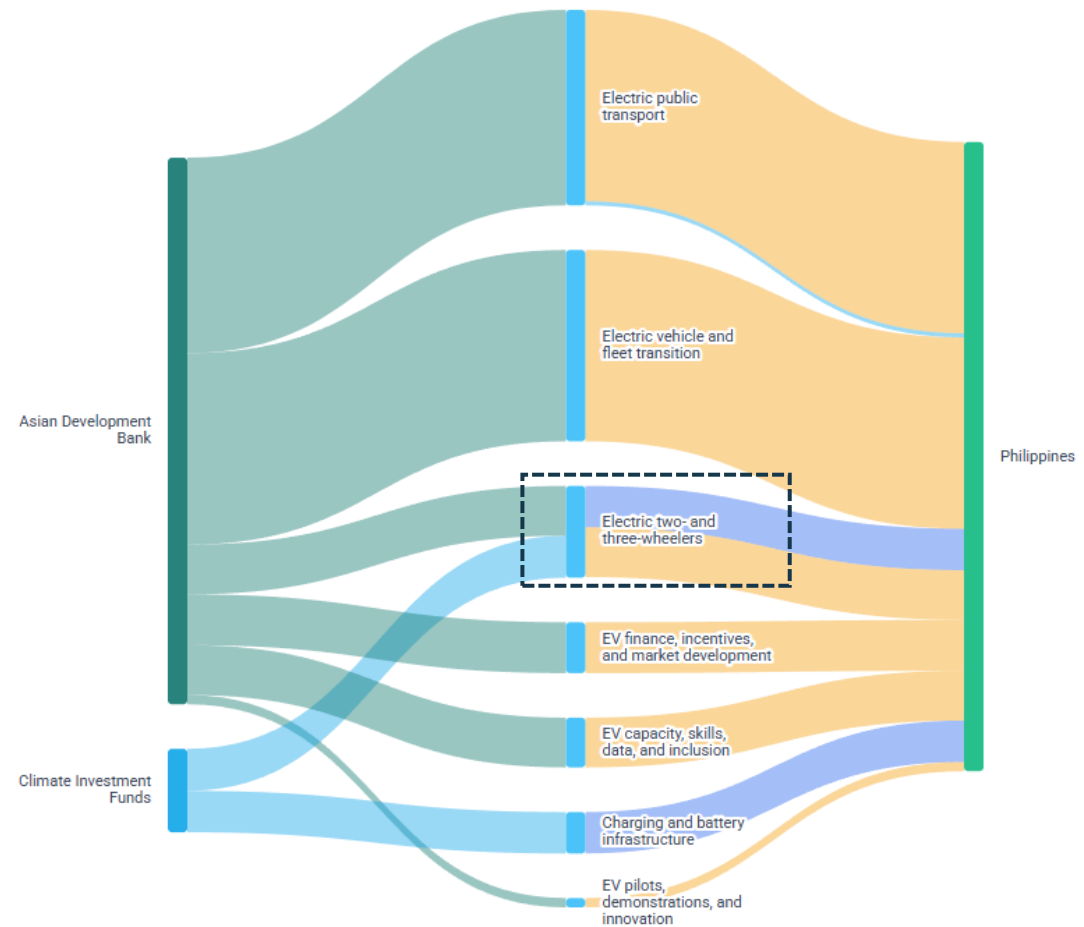
Top Donors

Largest e-mobility finance sources by constant 2024 USD disbursements.

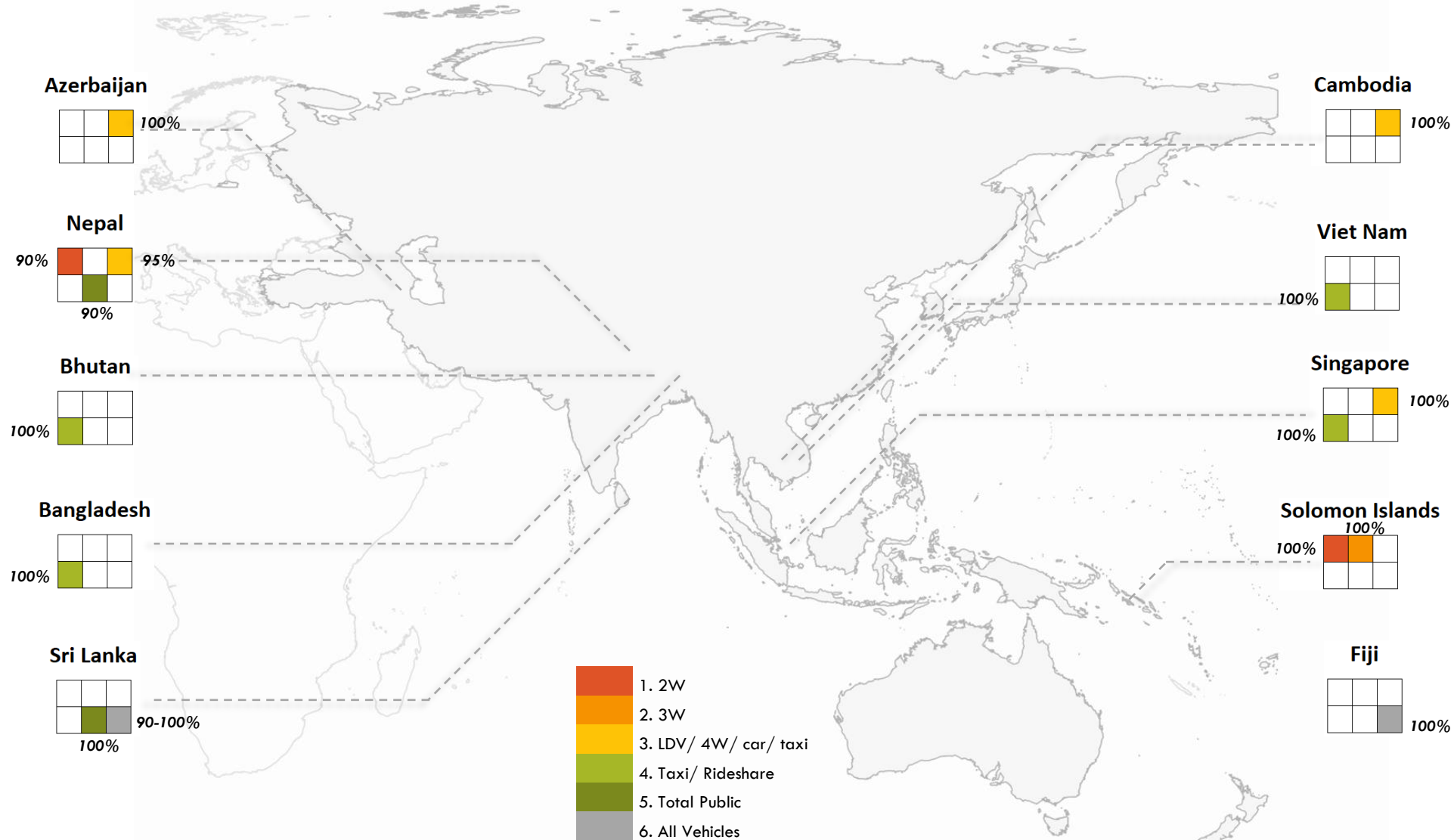


Recipient-link colors: flow type

ODA Grants ODA Loans Other Official Flows Other Flow Types

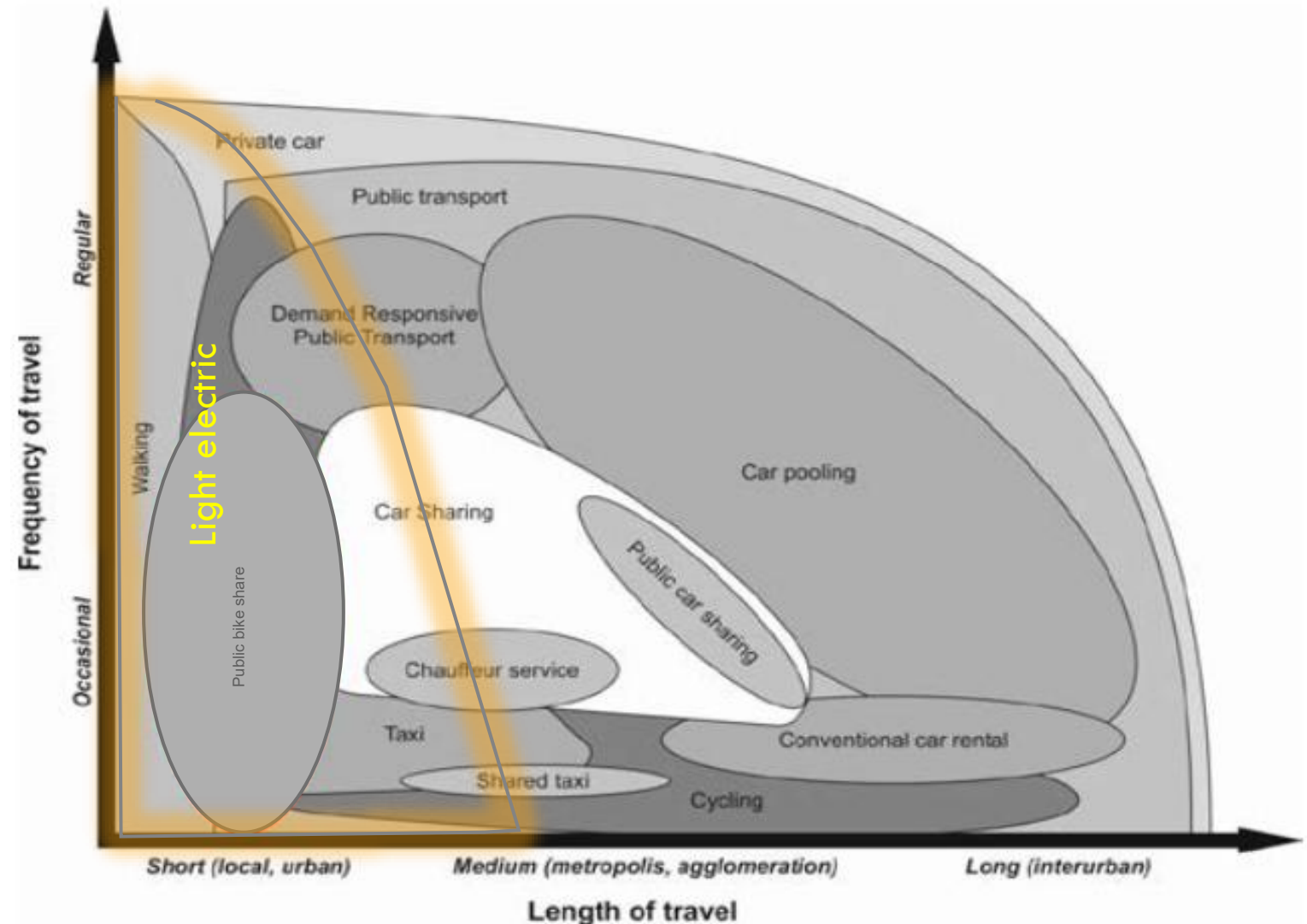


Countries targeting ambitious (>90%) shares of EV



LEVs

- Unique significance as a transport mode filling in a specific niche in addressing urban transport needs
- Provides a unique combination of flexibility, comfort, range*speed in providing mobility services – compete with or complement other modes
- Significant existing integration in many Asian transport systems



Shapes & sizes... and weight...and speed...and...

	Speed	Vehicle Category	BN	KH	ID	LA	MY	MM	PH	SG	TH	VN
E2W	Low (< 25 km/h)	Electric Kick-Scooter Not included in UNECE L Category and EU categorisation.	○	-	●	○		-	●	●	○	○
		Powered Cycle (E-Bike) Refers to L1 in UNECE L Category and L1e-A according to EU categorisation.	○	○	●	○	● ^c	○	● ^a	●	○	●
E3W	Medium Low (25-50 km/h)	Moped Refers to L1 in UNECE L Category and L1e-B according to EU categorisation.	●	○	●	○	● ^c	○	●	●	● ^c	●
		Three-Wheel Moped Refers to L2 in UNECE L Category	- ^b	●	●	○		●	● ^a	X	-	-
E2W	Medium High (>50 km/h)	Motorcycle Refers to L3 in UNECE L Category	●	●	●	●	●	●	●	●	●	●
E3W		Motorcycle with Sidecar Refers to L4 in UNECE L Category	●	●	●	●	●	- ^b	●	●	●	○
		Powered Tricycle Refers to L5 in UNECE L Category	●	●	●	●	●	●	●	●	●	- ^b
Light E4W	Medium Low (25-50 km/h)	Light Quadricycle Refers to L6 in UNECE L Category	●	○	●	○	●	-	●	X	● ^c	●
	Medium High (>50 km/h)	Heavy Quadricycle Refers to L7 in UNECE L Category	●	●	●	○	●	-	●	X	●	●

LEGEND

●	Available and regulated	○	Available but unregulated	-	Not available	X	Not allowed
a	Definition slightly differs	b	Regulation available	c	not allowed to be registered for on-the-road use		



E-Kick Scooter
Photo Source: Wuppertal Institute



E-Powered Cycle or E-Bike (L1e-A)
Photo Source: [Torque](#)



E-Moped (L1e-B)
Photo Source: SOLUTIONSplus



E-Three-Wheel Moped (L2)
Photo Source: SOLUTIONSplus



E-Motorcycle (L3)
Photo Source: Wuppertal Institute



E-Motorcycle with Side-Cars (L4)
Photo Source: [Motorcycle Cruiser](#)



E-Powered Tricycle (L5)
Photo Source: Wuppertal Institute



E-Light Quadricycle (L6)
Photo Source: [eCar](#)



E-Heavy Quadricycle (L7)
Photo Source: SOLUTIONSplus

Light Electric Vehicles

social



- Attract more diverse groups of users (e.g. pedelecs ; e-scooters)
- Contribute towards the attainment of more equitable transport systems by enabling easier access to destinations and mass transit services
- Potentially create a shift away from car-centric paradigms
- Safety concerns
- Concerns about equity
- Overall acceptance

economic



- Reduce congestion costs by shifting short “car” trips
- Contribute towards increasing affordability of overall transport services
- Provide income generation opportunities at the local level – “gig economy”
- Potential negative economic impacts to some segments/modes
- Costs of crashes
- Trips may be as costly/more costly on a per trip or per km basis against other modes

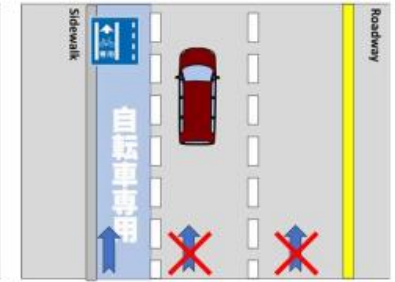
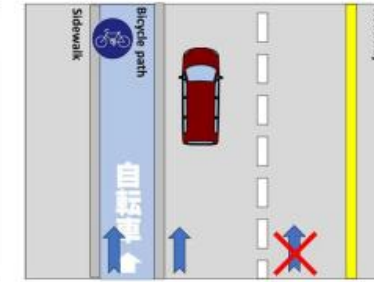
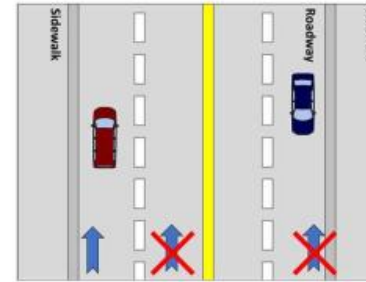
environment



- Reduce energy consumption per unit of transport service
- Reduce urban air pollution
- Reduce GHG emissions
- Shifting of trips may come from active transport modes
- End-of-life issues – particularly batteries

Japan - Small Motorized Bicycles

- From July 1, 2023 onwards, **specified small motorized bicycle** category came into effect.
- Technical limits:**
 - ≤ 20 km/h, ≤ 0.6 kW,
 - ≤ 190 cm length, ≤ 60 cm width
- No driver's license required**, but riders must be **16+**. Even electric scooters and similar vehicles that do not meet the required standards must be operated by a licensed driver, and are prohibited from being driven on sidewalks. Violations are subject to penalties.
- Registration plate, safety compliance, and liability insurance required**
- Road use:** generally on roadways / bicycle lanes; sidewalk use only in limited 6 km/h mode
- User rules:** no alcohol, no phone use, no passengers; helmet encouraged



"Bicycles and Specified Small Motorized Bicycles Only"

"Traffic Lanes Exclusive for Standard Bicycles"



"Standard Bicycles and Pedestrians Only"



People's Republic of China – Electric Bicycle

- The national mandatory standard for the electric bicycle is **GB 17761-2024: Safety technical specification for electric bicycle** (fire resistance, braking, anti-tampering, battery/controller/speed-limiter security, vehicle quality control, and product consistency)
- The new standard limits total plastic mass to 5.5% of vehicle mass, strengthens flame-retardant requirements, adds battery/control anti-tampering requirements, and requires safety monitoring/communication functions; commercial e-bikes must activate the monitoring function, while private users may choose whether to activate/close location service.
- Under PRC's Road Traffic Safety Law, electric bicycles are treated under the **non-motor vehicle** rules: they should use non-motor vehicle lanes, or keep to the right side where no such lane exists. In non-motor lanes, electric bicycles must not exceed **15 km/h**.
- PRC has also developed a mandatory national standard for **electric bicycle charging piles: GB 47371-2026, Safety technical specification for electric bicycle charging pile**, issued **31 Mar 2026** and scheduled for implementation on **1 Apr 2027**.
- The 2025 national trade-in guidance gives subsidies to consumers who scrap old e-bikes and buy compliant new ones; new e-bikes used in the program must have a product certificate and CCC certification. It also requires old vehicles and batteries to go through qualified recycling and disposal channels.



People's Republic of China e-3Wheelers

- **PRC e-3Ws**, the national-level rules are mostly about **product approval and motor-vehicle compliance**, while the practical operating rules—where they can run, whether older/non-compliant vehicles are phased out, who can use them, and what exceptions exist—are often made by **cities**.
- Road-going compliant e-3Ws are treated as **motor vehicles**
- Vehicles need to be produced by approved manufacturers and included in the **Road Motor Vehicle Production Enterprises and Products Announcement** administered through the national motor-vehicle product approval system.
- Electric motorcycle / moped standards apply, especially GB/T 24158-2018: General specifications for electric motorcycles and electric mopeds and GB 24155-2020: Safety specifications for electric motorcycles and electric mopeds
- Drivers need the appropriate motorcycle license.
- Compliant e-3Ws need compulsory motor-vehicle traffic accident liability insurance.
- Local governments can restrict or prohibit use, especially in dense urban areas.



Indonesia – Small Electric Vehicles

- Indonesia's umbrella policy is **Presidential Regulation No. 55/2019** on accelerating battery electric vehicles for road transport. It covers battery electric vehicles and provides the basis for incentives, local production, charging infrastructure, and EV ecosystem development. It was later amended by Presidential Regulation No. 79/2023.
- Ministry of Transport **PM 45/2020** regulates “certain vehicles using electric motors.” It covers **electric scooters, electric bicycles, hoverboards, electric unicycles, and otopet**. Users must wear a **helmet**, be at least **12 years old**, and riders aged **12–15** must be accompanied by an adult. Passengers are not allowed except on electric bicycles equipped with a passenger seat. Modifying motor power to increase speed is prohibited. Users must prioritize pedestrians, maintain safe distance, and ride with full concentration
- Operation is limited to **bike lanes, dedicated lanes, residential areas, car-free-day roads, tourism areas, mass-transit areas, office areas, and other designated spaces.**



Malaysia – Micromobility Vehicles

- Malaysia's Road Transport Act framework defines a **micromobility vehicle** broadly as a vehicle propelled by electricity, internal combustion engine, human power, or a combination of these, with a maximum speed of **50 km/h**.
- The **Road Traffic (Prohibition of Use of Certain Micromobility Vehicles) Rules 2021**, effective **17 December 2021**, prohibits certain micromobility vehicles from use on roads. The prohibited categories include **mopeds** – including vehicles propelled by electricity or small ICE, with throttle/speed control, seat, 2 or 3 wheels, pedals, unladen weight not exceeding 150 kg, and speed not exceeding 50 km/h. - , **personal mobility devices (PMDs)**, and **personal mobility aids (PMAs)**
- Malaysia distinguishes compliant electric pedal-assisted bicycles from banned PMDs/e-scooters. **MS 2514:2015** covers electric pedal-assisted bicycles for road use: max continuous rated motor power **0.25 kW**, assistance progressively reduced and cut off at **25 km/h**, or sooner if the cyclist stops pedaling.
- Malaysia allows exemptions through a **micromobility sandbox**. PLANMalaysia's micromobility route guidelines state that MOT may grant exemptions through sandbox programs, and MIROS developed sandbox implementation guidelines. The four key aspects are **infrastructure, users, vehicles, and service operators**.



Malaysia - e-3Wheelers

- Road-going three-wheeled motorcycles are treated as motor vehicles. JPJ's **Vehicle Type Approval (VTA)** process is required before registration of new vehicle models; VTA controls identity, dimensions, weight, construction characteristics, and specifications under the Road Transport Act and Road Transport Rules
- In 2025, Malaysia's Transport Minister stated that modified motorcycles used for **goods transport must comply with technical specifications and obtain Road Transport Department (JPJ) VTA**. Also, three-wheeled motorcycles with sidecars, such as **Category L4**, can be road-legal if **registered and licensed** as goods vehicles.
- Malaysia participates in the UN WP.29 vehicle standards framework. JPJ states that, as a contracting state under the 1958 Agreement, Malaysia gazettes UN Regulations into national legislation through the Motor Vehicles (Construction and Use) Rules 1959 under the Road Transport Act



Thailand Light Electric Vehicles

- No single “LEV operating code”; road-going LEVs are regulated mainly as **motor vehicles**.
- **Registration is central:** road use requires DLT-compliant registration and plates.
- **Electric motorcycles:** at least **250 W** and capable of **45 km/h**; public e-motorcycles capped at **4 kW**. **Electric three-wheelers / e-tuk-tuks:** at least **4 kW** and capable of **45 km/h**.
- Operation depends on existing rules: **licensing, helmets, road traffic rules, vehicle inspection, and public-service permits**. For conversions, DLT requires engineering/electrical certification and inspection of motor, battery, braking, suspension, wiring, GVW, top speed, and range.
- TISI has **TIS 62840 Part 1-2563: Electric vehicle battery swap system — General and guidance**, and **TIS 62840 Part 2-2563: Electric vehicle battery swap system — Safety requirements**.
- TISI also has EV conductive charging standards based on IEC 61851, and the draft/standard materials explicitly reference charging requirements for electric vehicles, including light electric vehicles.



<https://ratchakitcha.soc.go.th/documents/17159177.pdf>
<https://service.tisi.go.th/tisi-standard-shop/item/tis/5023>

India – Public Charing Deployment

Operational Guidelines for Deployment of EV Public Charging Stations under PM E-DRIVE, 26 Sept 2025

- **Eligible implementers:** Proposals can be submitted by **Government of India ministries, central public sector enterprises, state/UT governments, and their nodal agencies.** These entities may operate charging stations themselves or appoint **Charge Point Operators (CPOs)**
- **Priority locations:** Deployment prioritizes **cities and highways.** City priorities include million-plus cities, smart cities, satellite towns connected to major metros, state/UT capitals, and National Clean Air Programme cities.
- **Digital/data requirement:** Installed charging stations must share operational data—such as **location, slot availability, pricing, and digital payment options**—with a **National Unified Hub** being developed by MHI
- **National Unified Hub:** BHEL is assigned to develop the Hub and mobile app, with functions such as **charger discovery, real-time status, slot booking, and digital payments.**



Summary

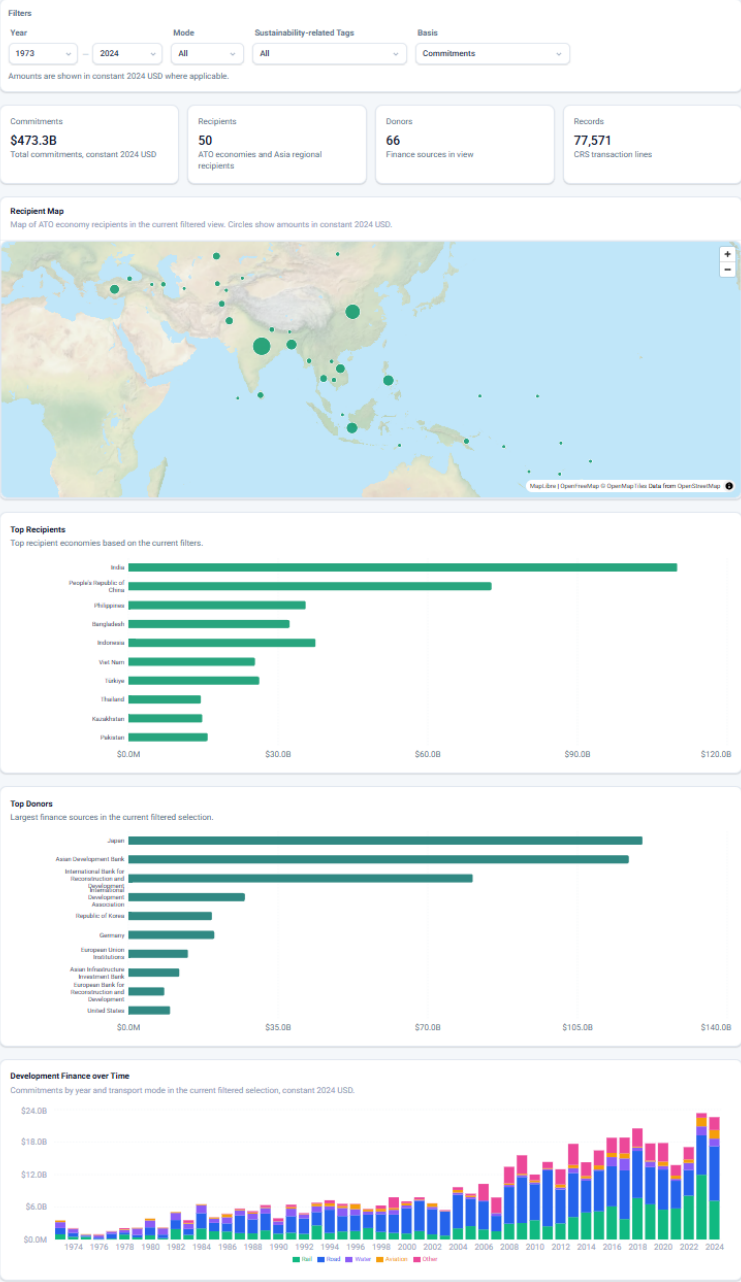
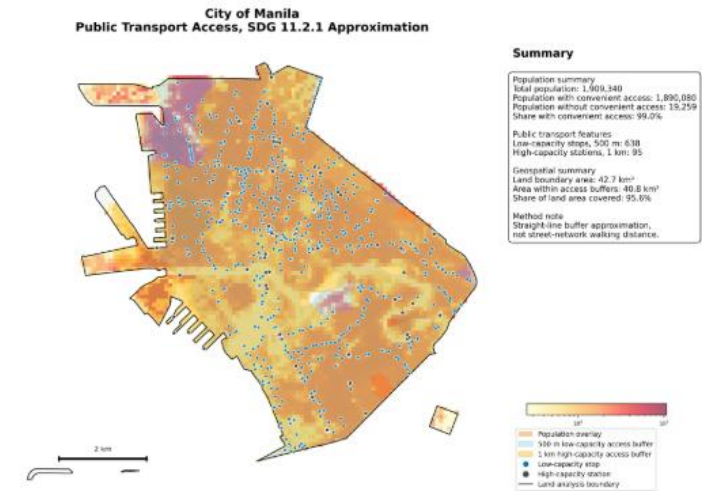
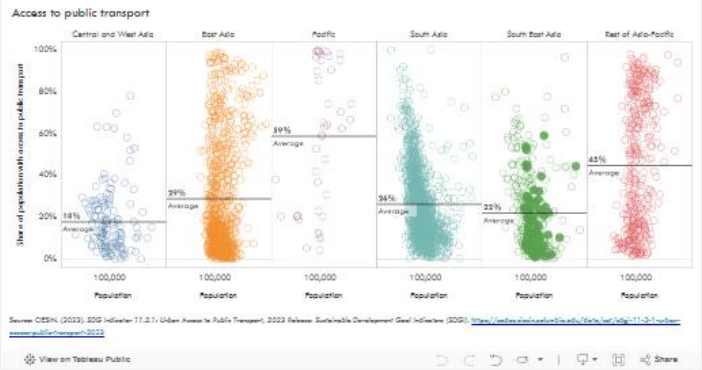
- Light electric vehicles are **integral to Asia's mobility transition**
- **Different LEV use cases require different policy approaches**, because micromobility, pedelecs, powered two-wheelers, and electric three-wheelers serve different trips, users, speeds, and operating environments.
- **Think package of measures rather than a single rule**, combining operational regulations, vehicle standards, charging and battery systems, infrastructure planning, data collection, and enforcement.
- **Emerging approaches** across Asia show that regulation can be adaptive and innovative

Analytical Outputs / ATO Country Profiles / Philippines

Information

Name: Philippines
Income Group: Lower middle income

Ensure access to sustainable transport for all Advance low- or zero-carbon, resilient, and environmentally sound transport systems Enhance efficiency at



Maritime Transport Profile

version June 2026

Gender in Transport Profile

version March 2026

Transport and Air Pollution Profile

version March 2026

Transport and Climate Profile

version February 2026

Green Roads Profile

version December 2025

Aichi Profile

version December 2023

Transport State of Play Presentation

State of Play

E-mobility Profile

version August 2023

Transport Sector Profile

version September 2023

Philippines

version July 2024

Philippines

version May 2024

Philippines

version May 2024

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***“ATO translates data into
insights, policies, and
investments”***

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