



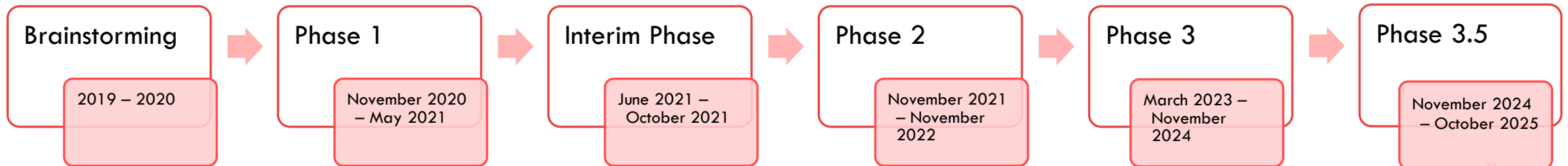
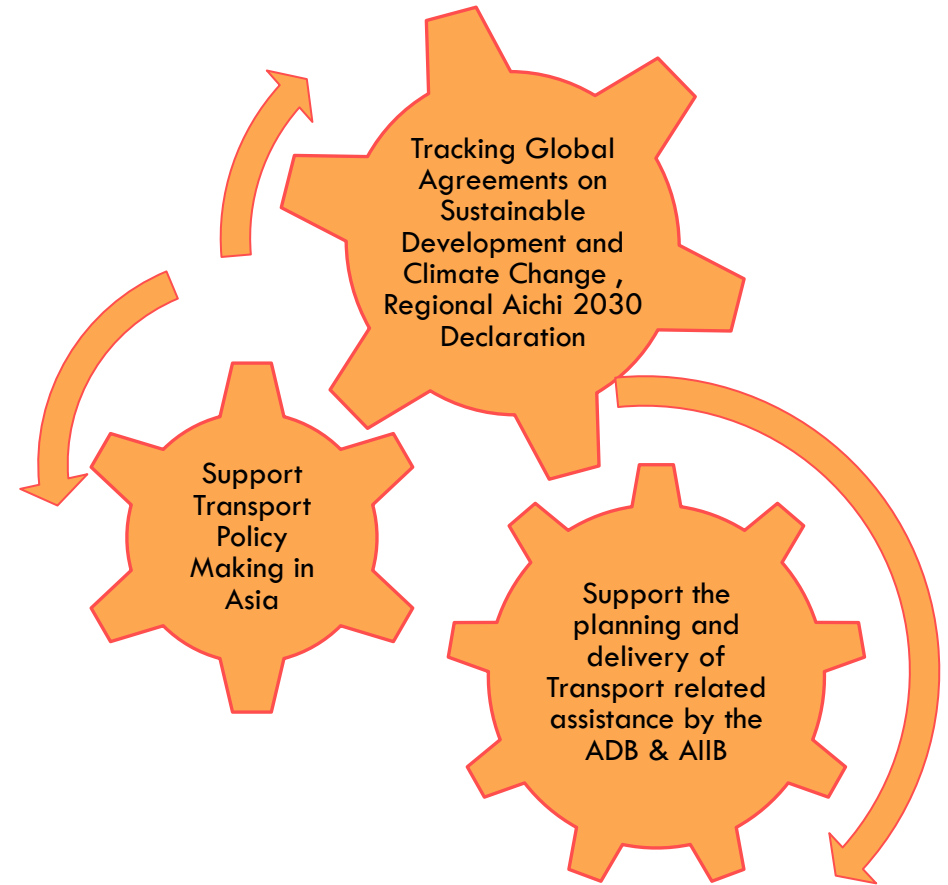
NAVIGATING CHANGE: The Evolving Landscape of the Road Sector in Asia

SUDHIR GOTA,
CO-TEAM LEAD
ASIAN TRANSPORT OUTLOOK

Asian Transport Outlook (ATO)



- 51 Economies (ADB Members + Russia and Iran)
- 460 Urban Centers (412 Asia-Pacific, 48 International)
- 46 Urban Centers with a detailed review * To be increased to 50



Asian Transport Outlook: A Catalyst for Sustainable Transport in Asia

536

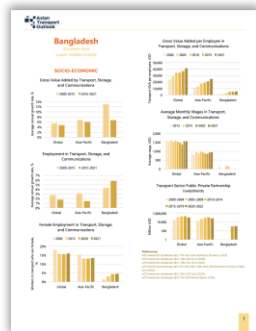
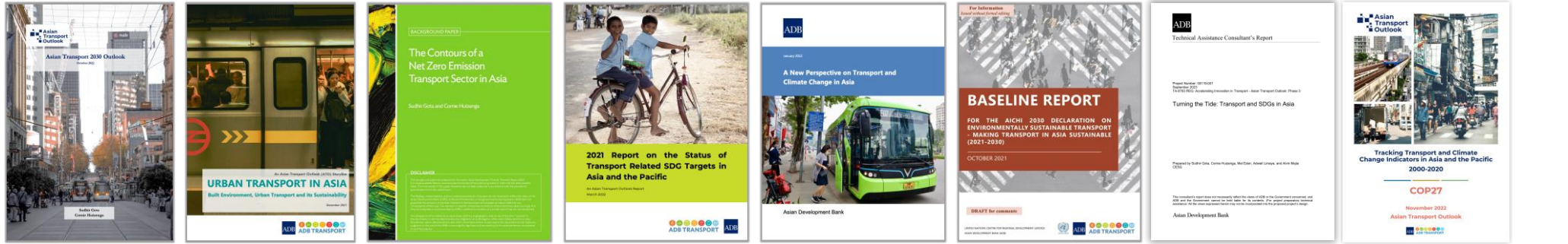
National indicators of which 45% are Road related

180

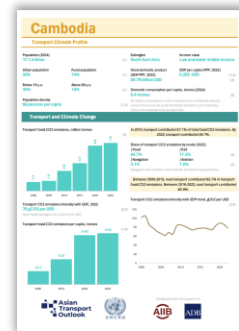
Urban indicators of which 30% are Road related

550

National Policy documents identified of which 80% are Road related



SDG Profiles (39 countries)



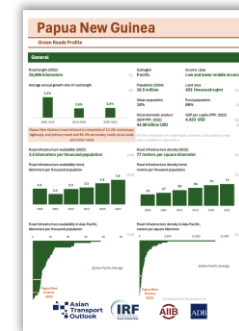
Transport Climate Profiles (23 countries)



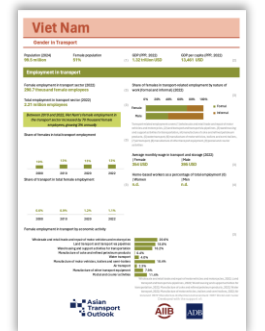
Road Safety Profiles (24 countries)



E-mobility Profiles (10 countries)



Green Roads Profiles (23 countries)

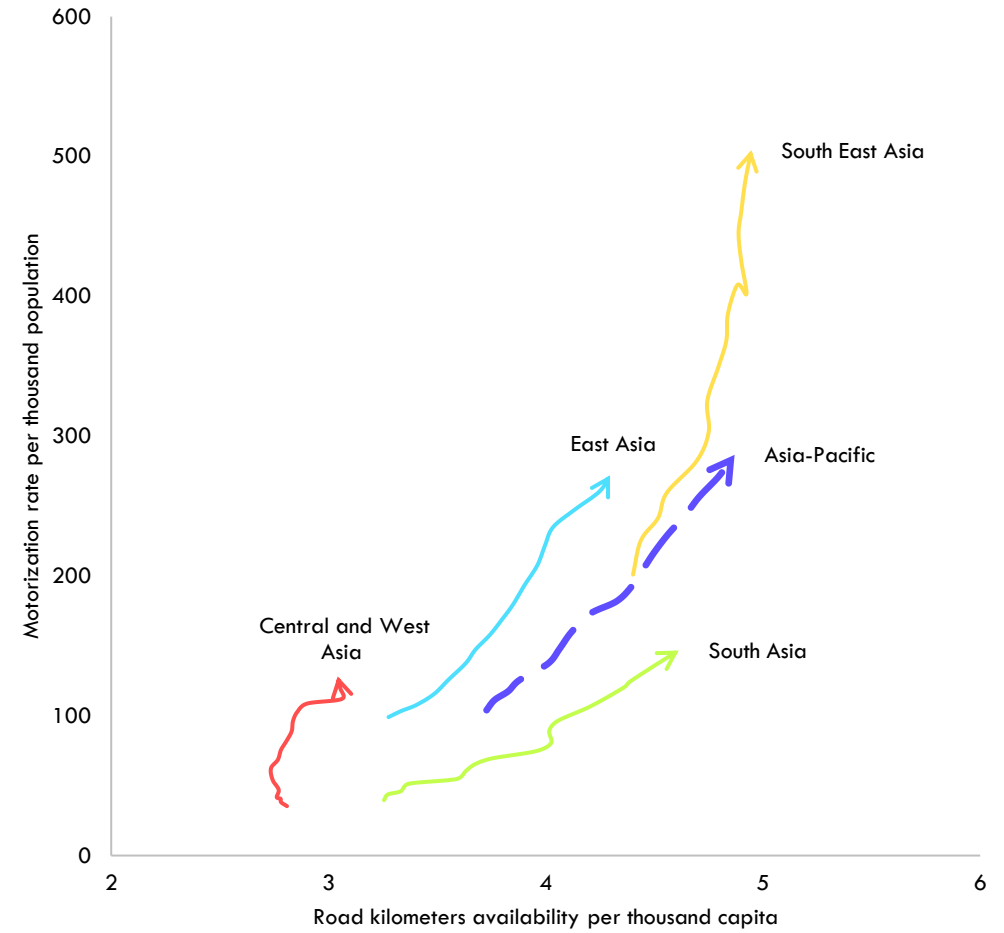
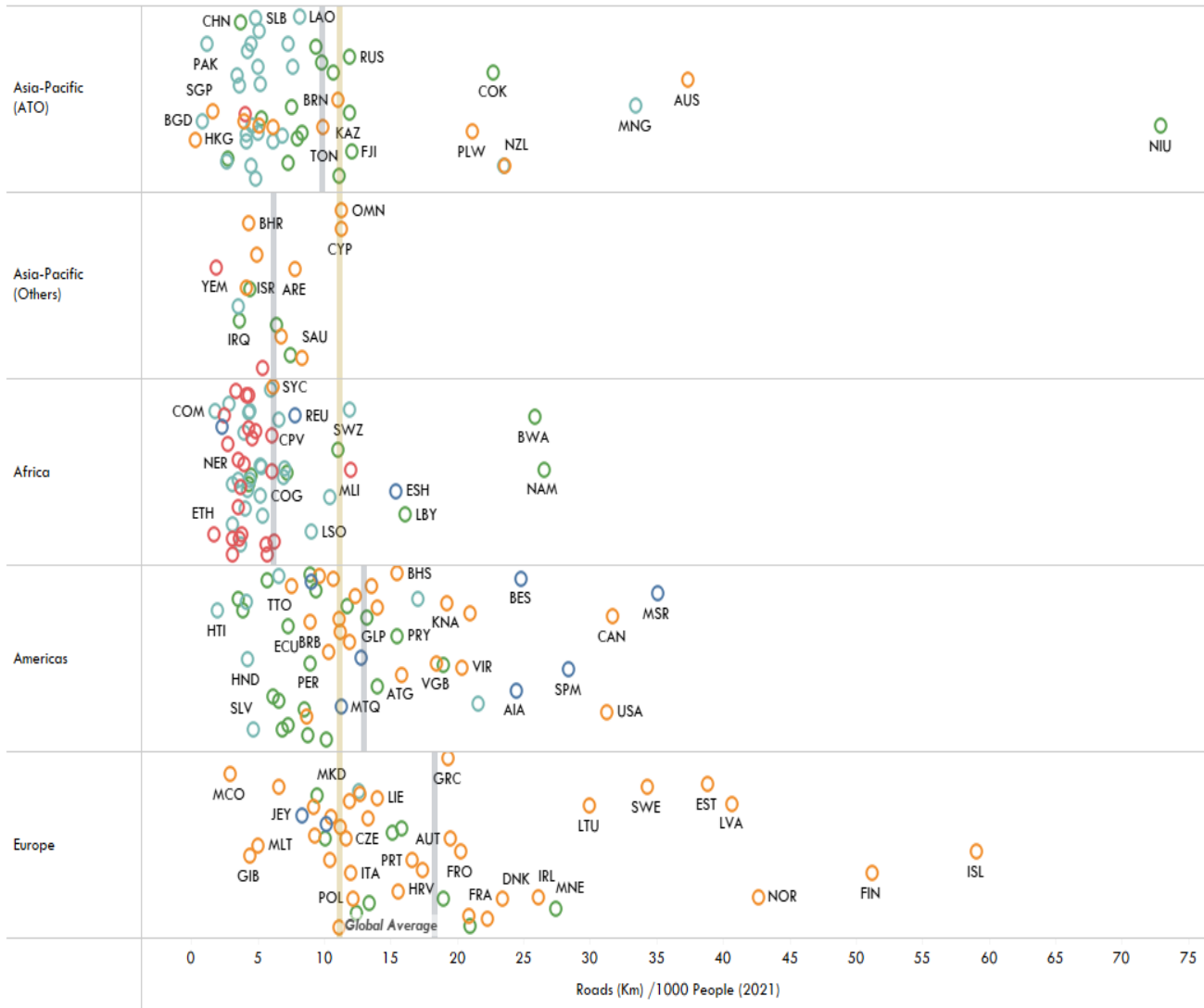


Gender Profiles (20 countries)

Business as Usual → Tipping Point!

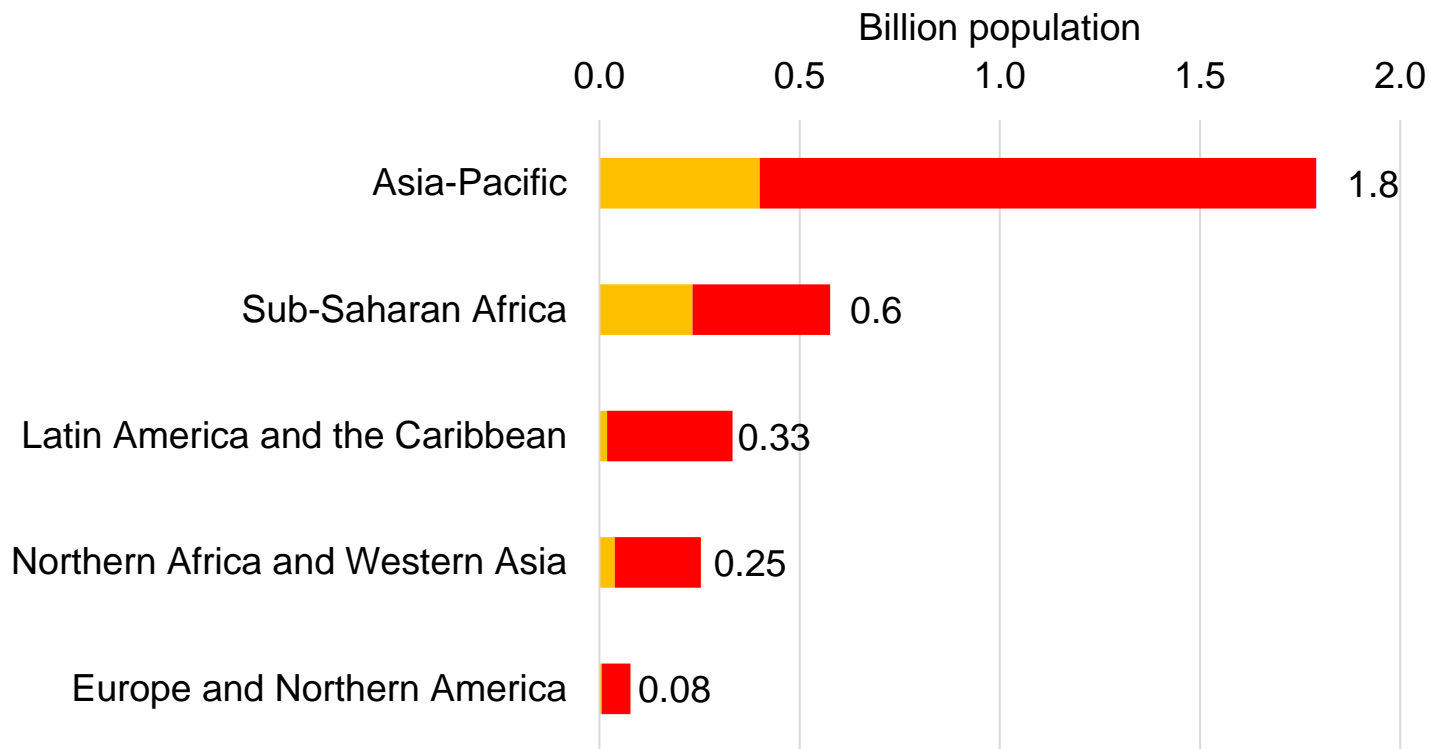
- **Push and Pull**
- **Less is More**
- **The Road Ahead is Charged**
- **From Choice to Necessity**

Infrastructure Gap & Fast-Growing Motorization



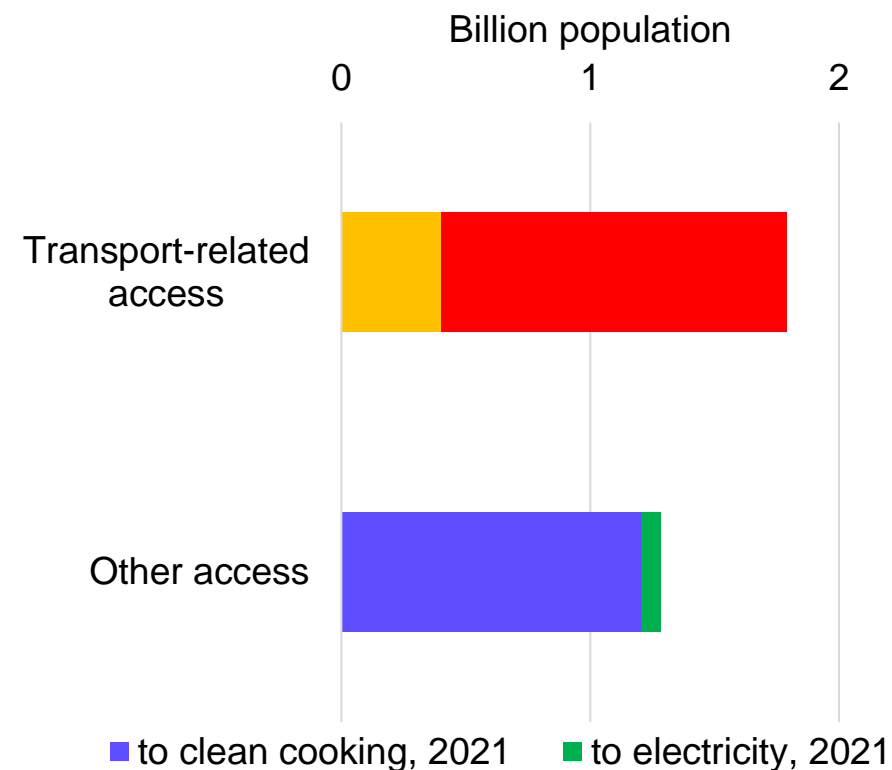
Connecting the Unconnected

Transport access gap



- Rural population without access to all-season roads, 2022
- Urban population without convenient access to public transport, 2022

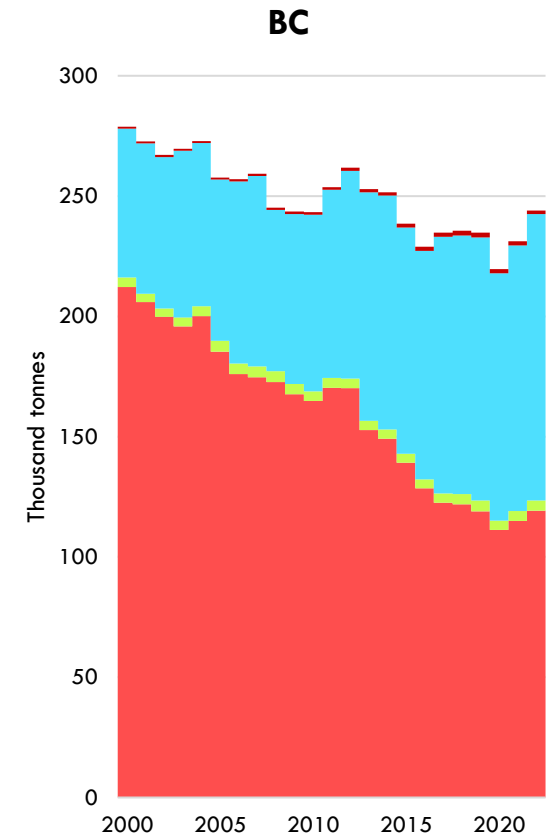
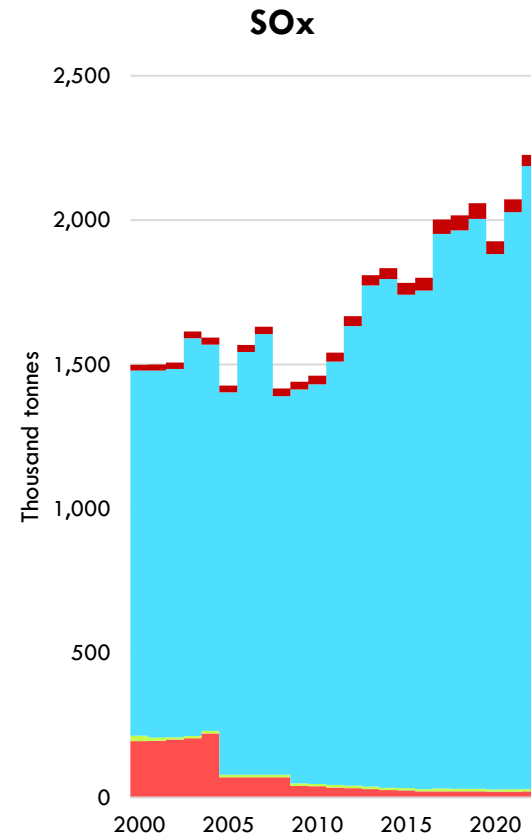
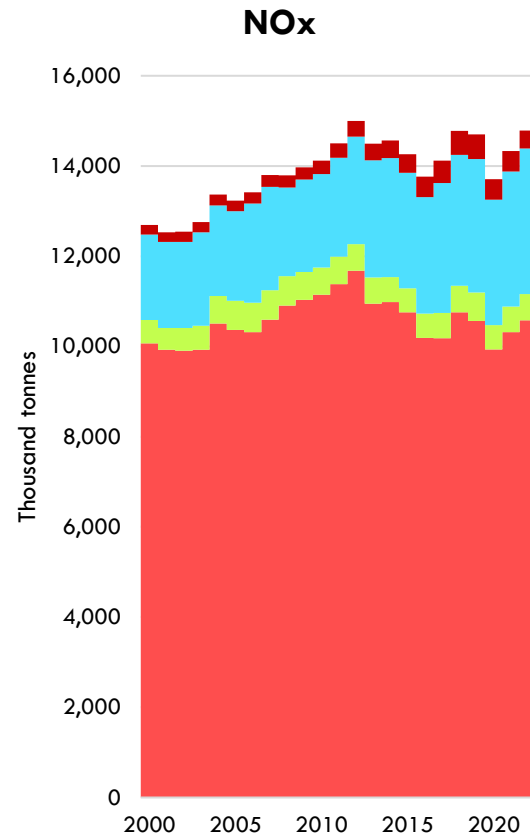
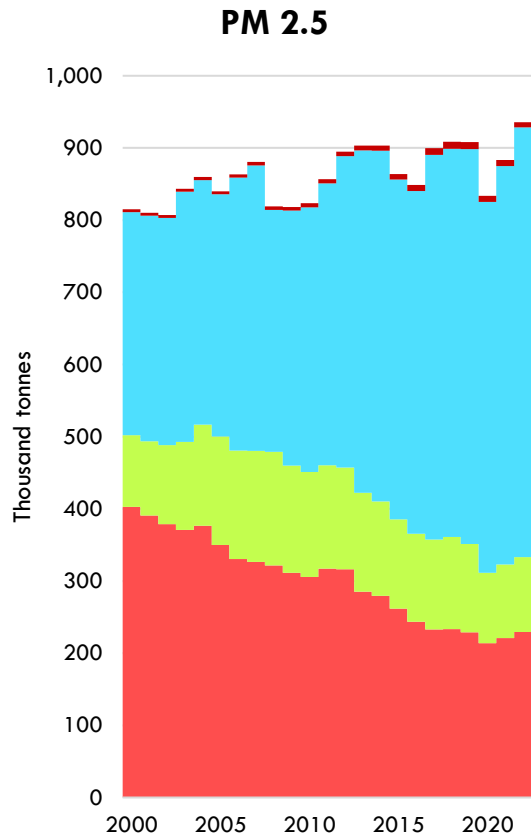
Population without access



- to clean cooking, 2021
- to electricity, 2021

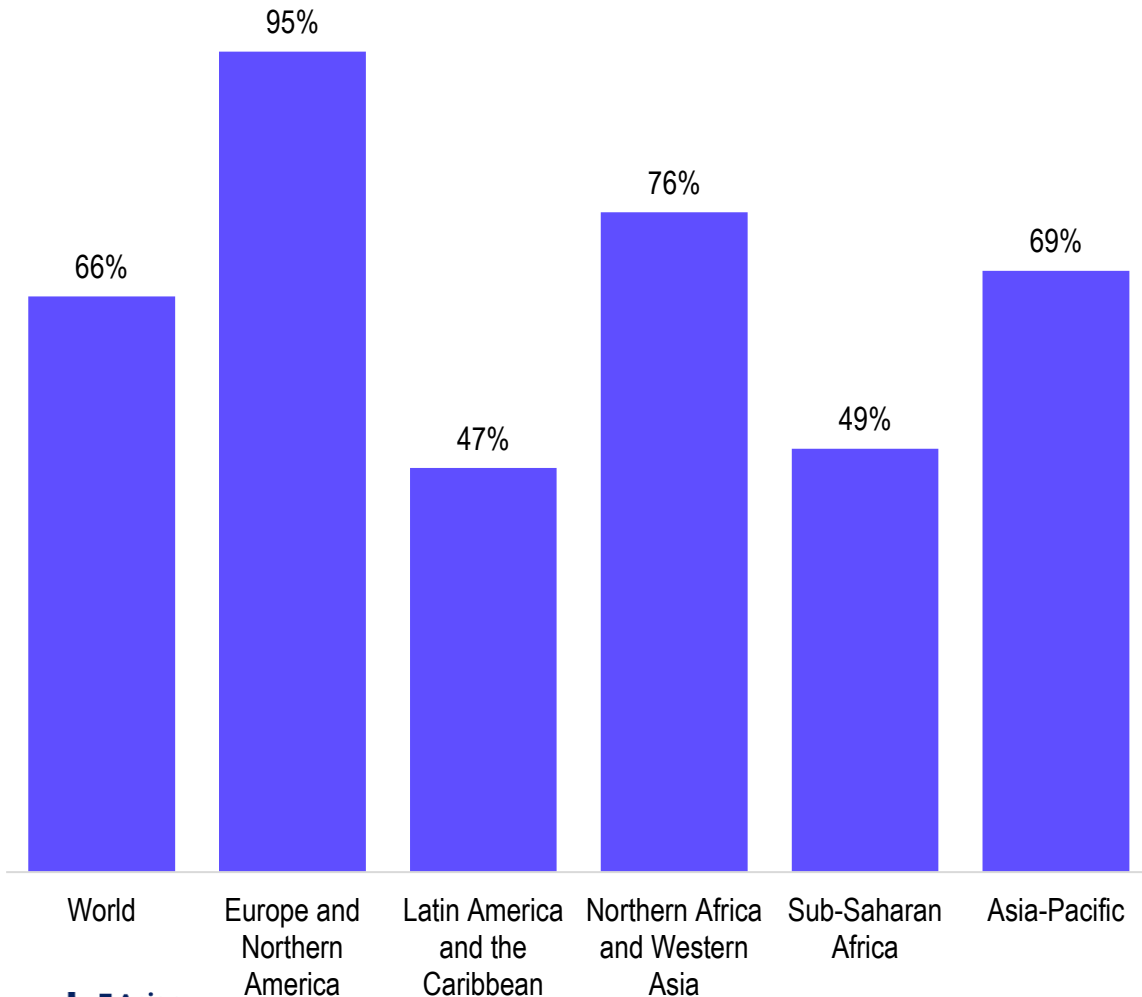
Transport is a Significant Source of Air Pollution

■ Road
 ■ Rail
 ■ Domestic navigation
 ■ Domestic Aviation

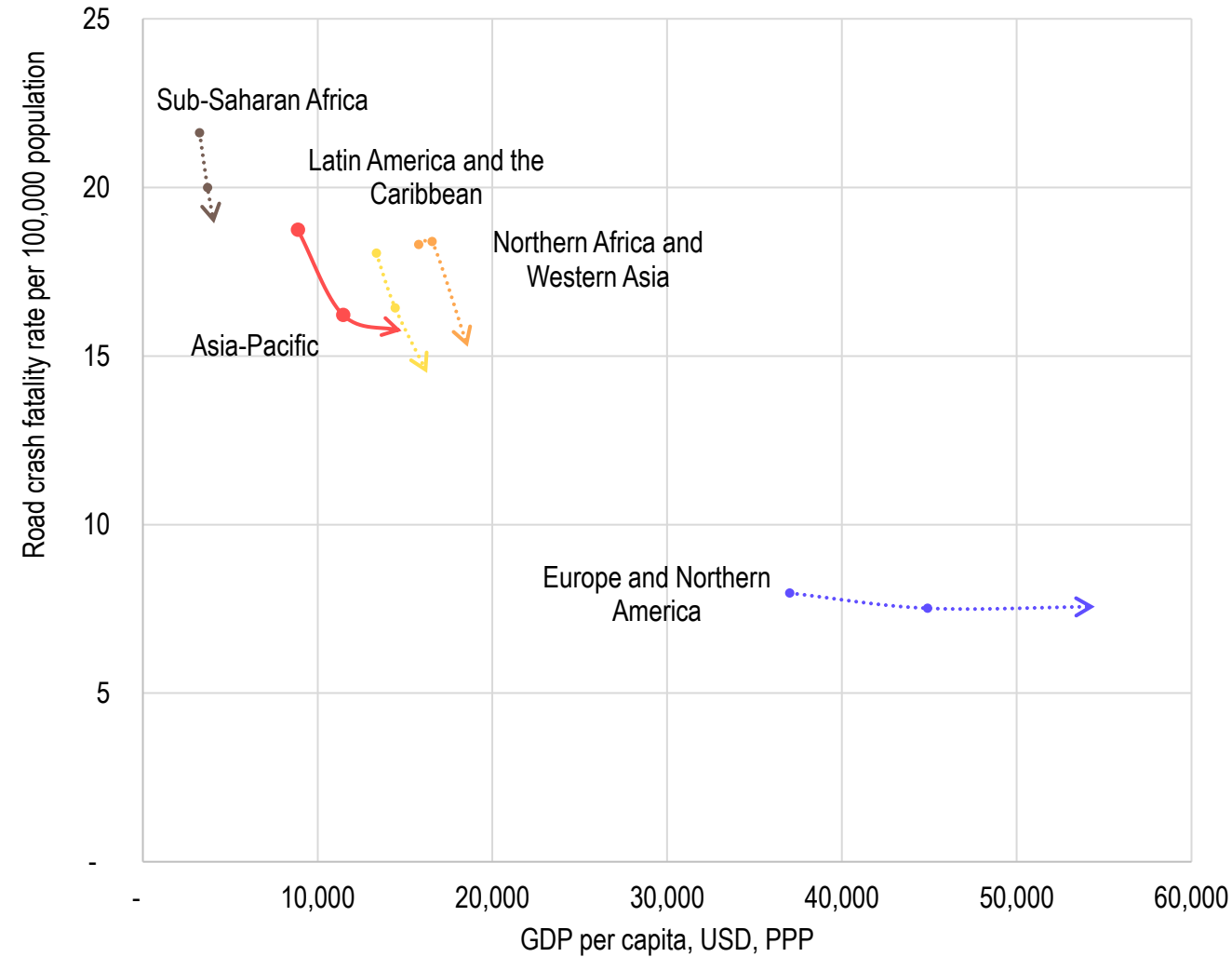


Can We Meet SDG Targets on Road Safety?

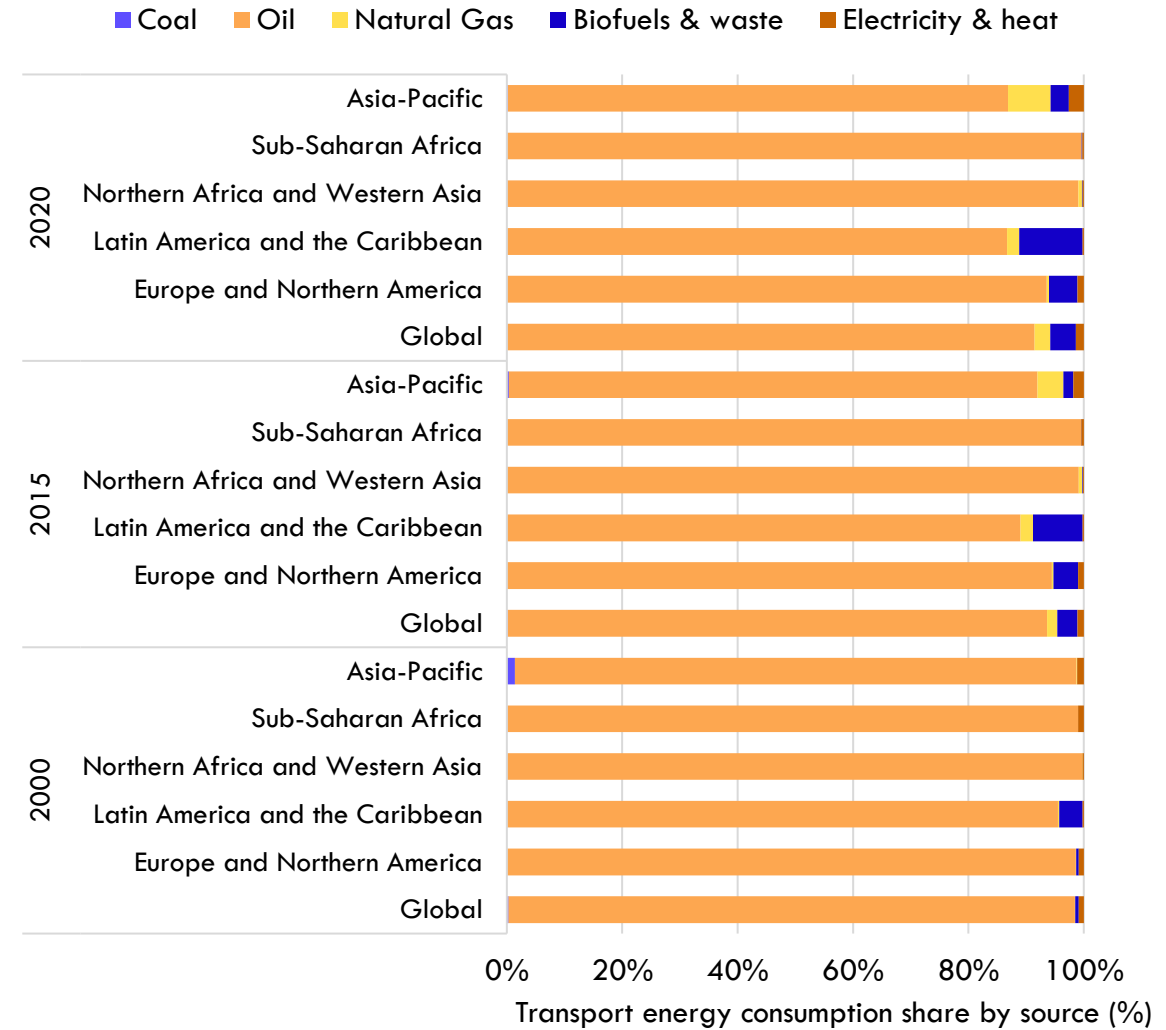
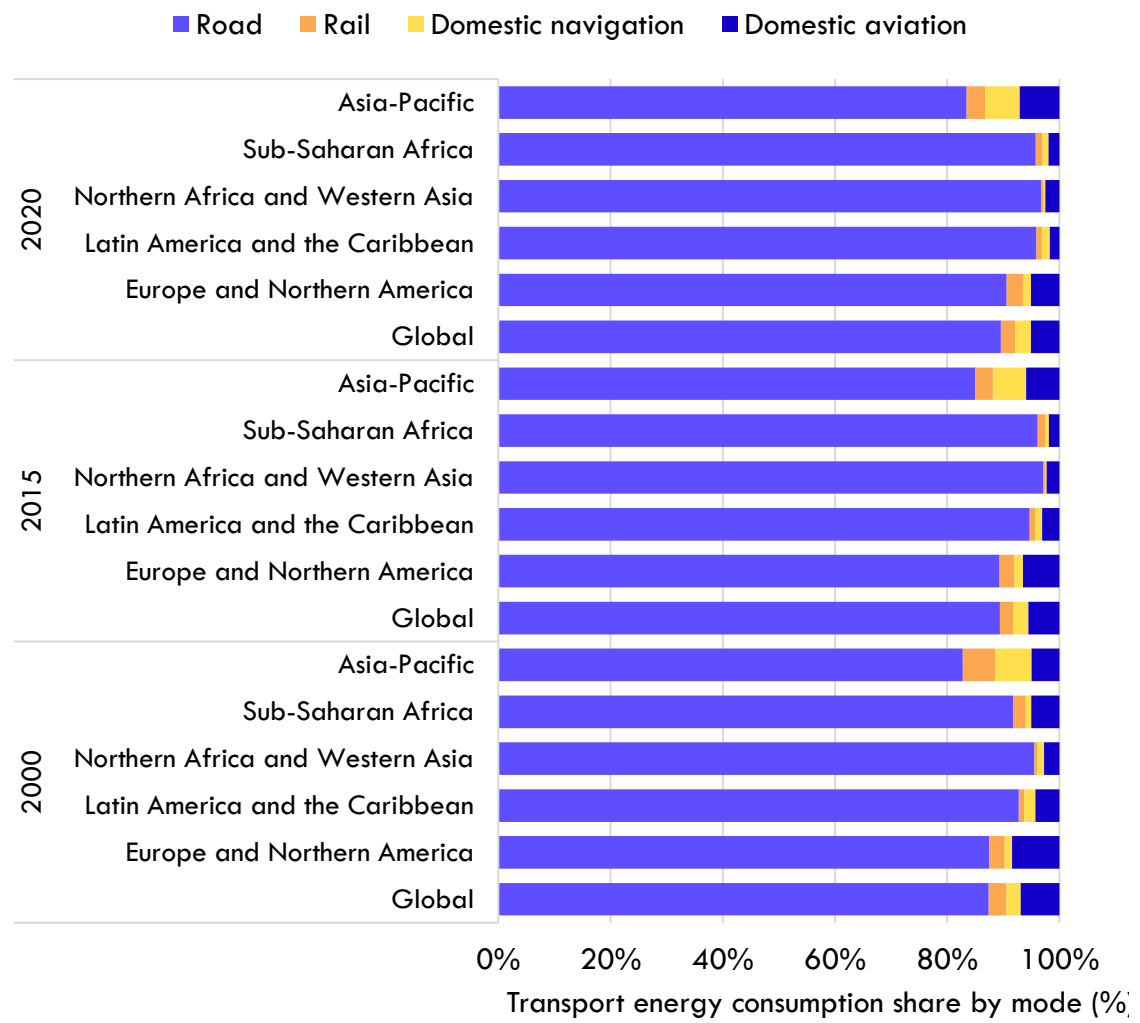
Share of countries reducing road crash fatalities between 2016-2021, by global region



GDP per capita vs. road crash fatality rate (2010, 2016, 2021)



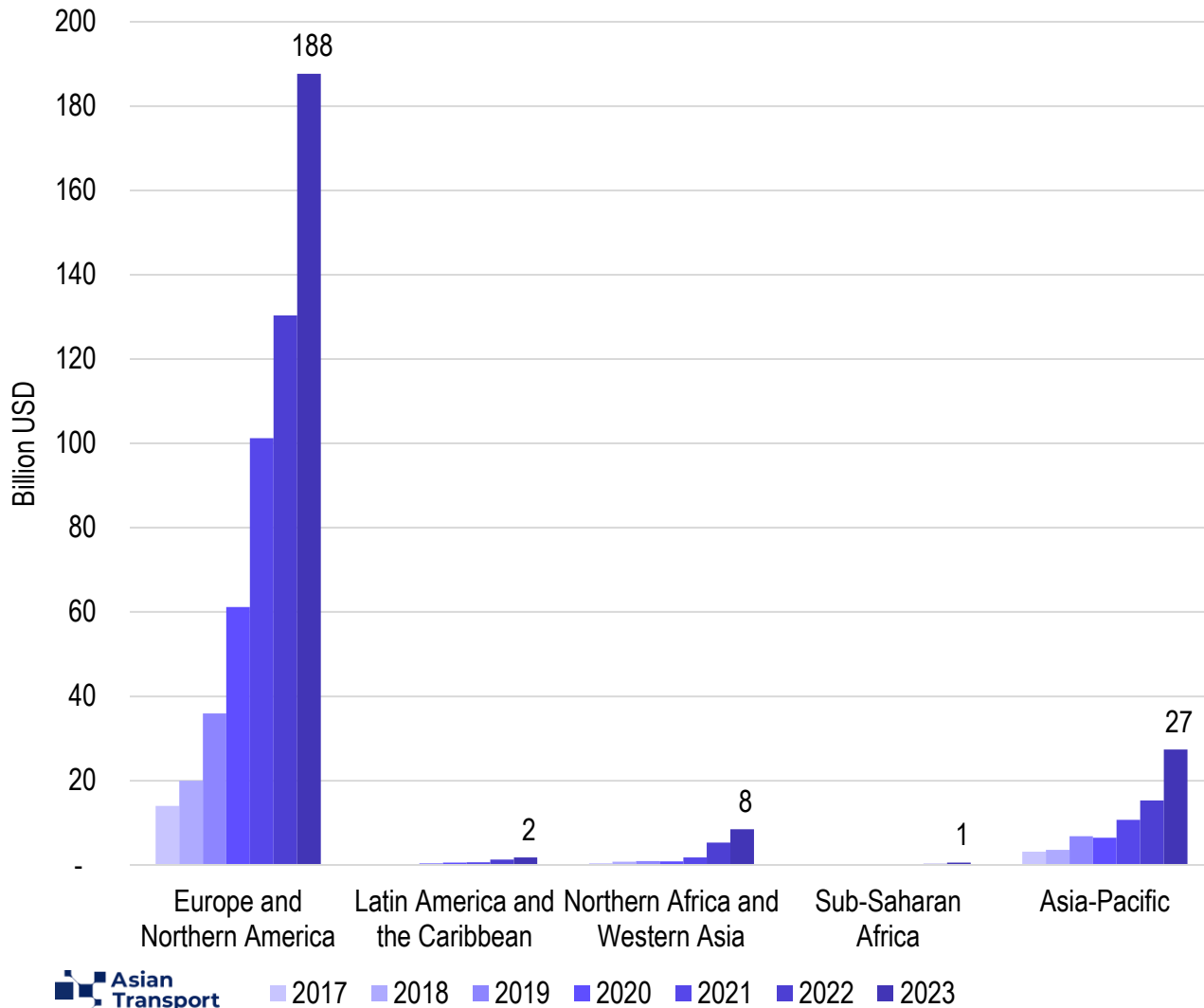
Road Transport's Oil Addiction: A Major Energy Consumer



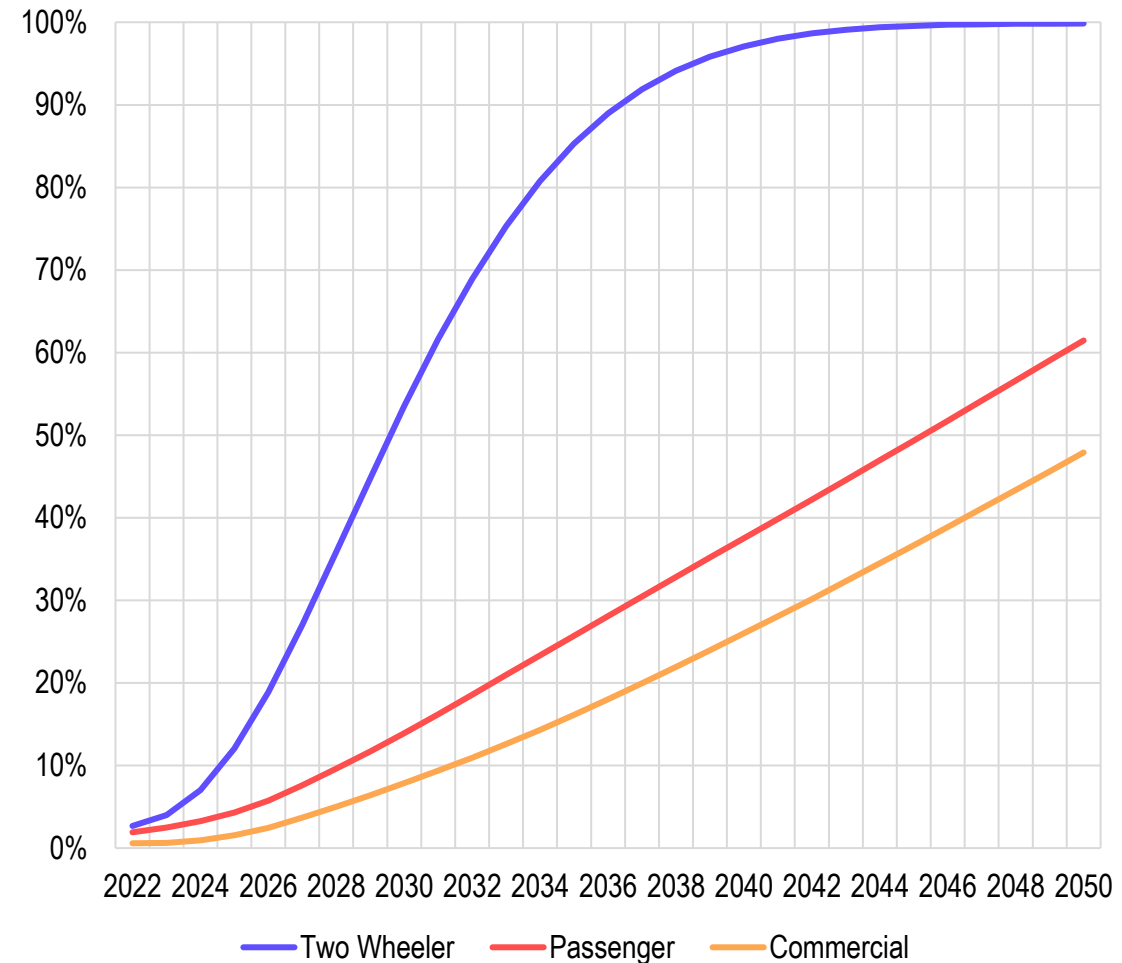
Source: ATO visualization based on data from UN

Asia's EV Surge: Beyond the Tipping Point

Total electric vehicle imports

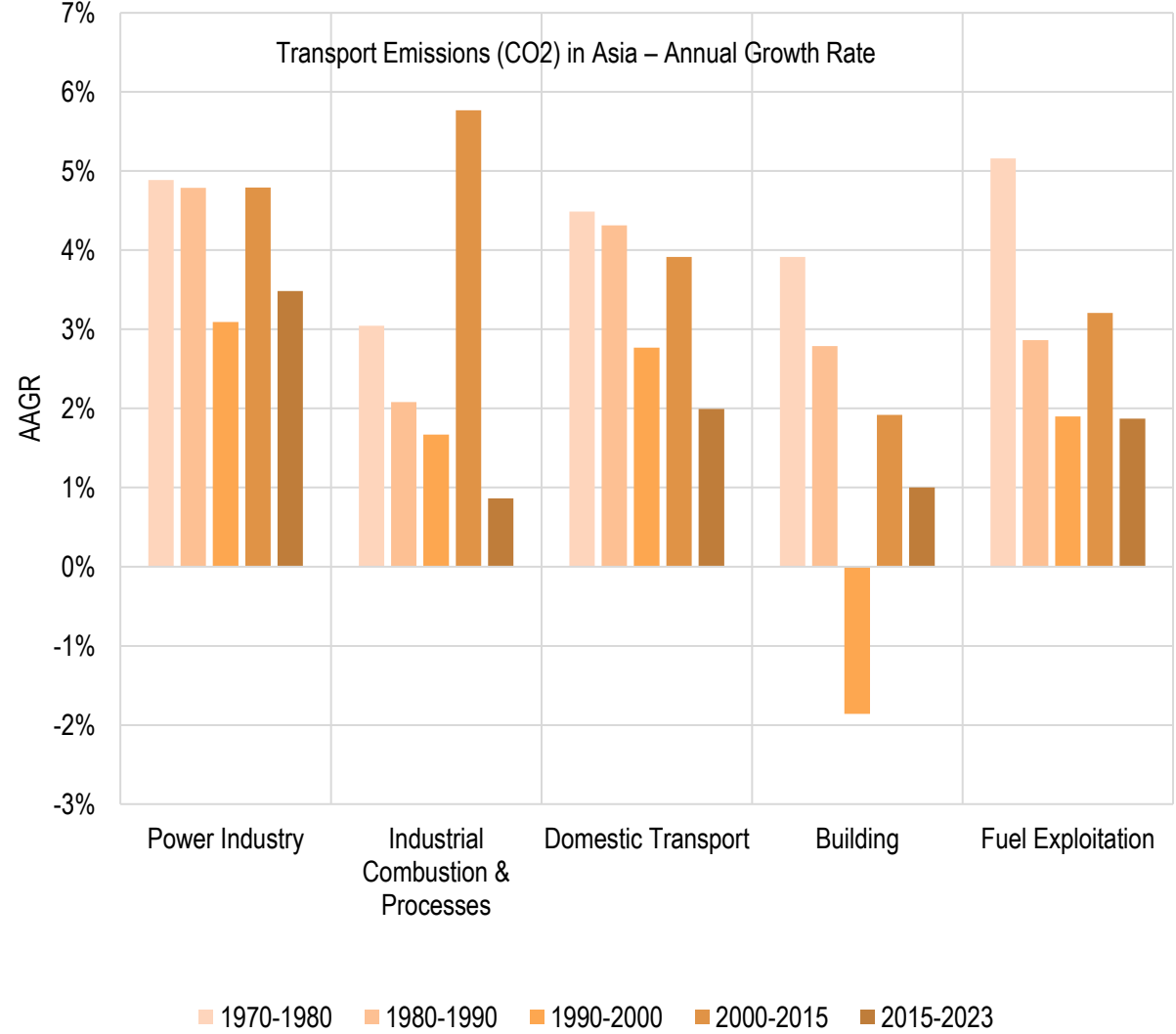
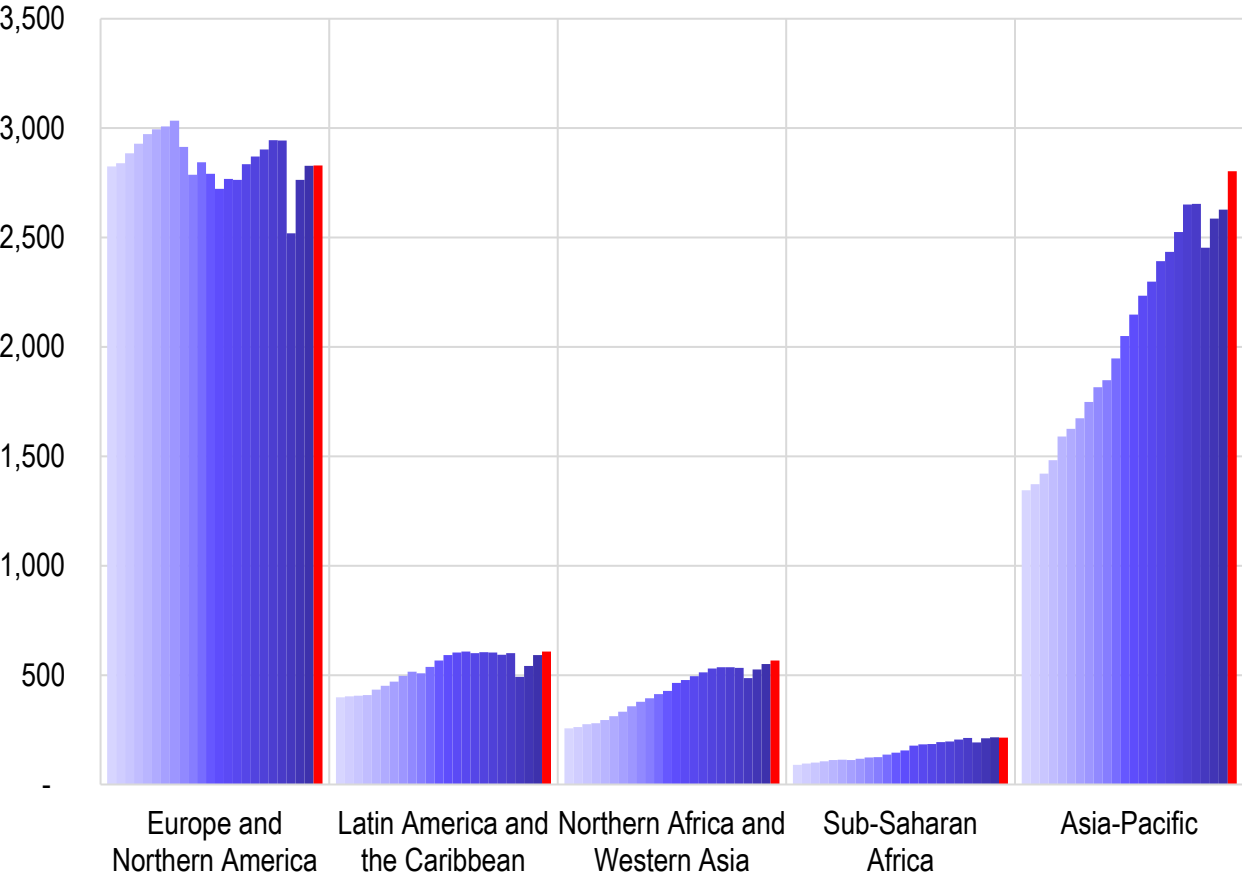


Share of Electric Vehicles in the Fleet (BEV,FCEV,PHEV)



Alarming Rise in Asia-Pacific Transport Carbon Emissions

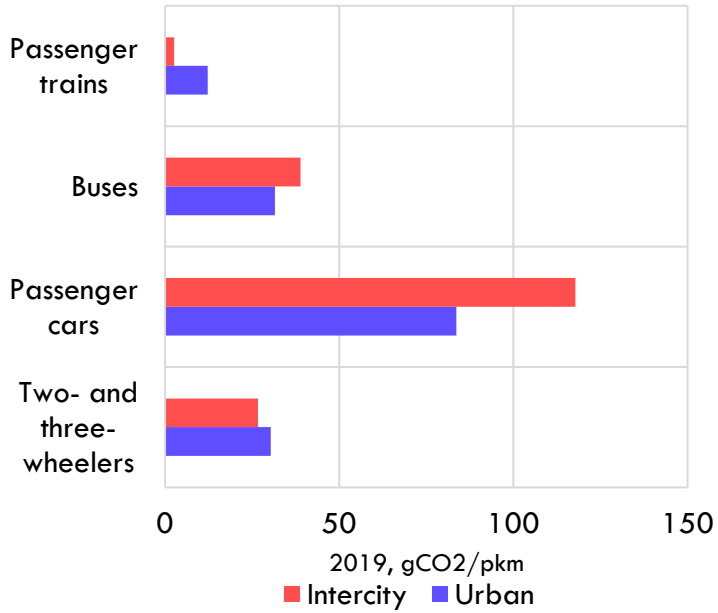
Domestic Transport CO2 Emissions, 2000-2023, Million Tonnes of CO2 Emissions



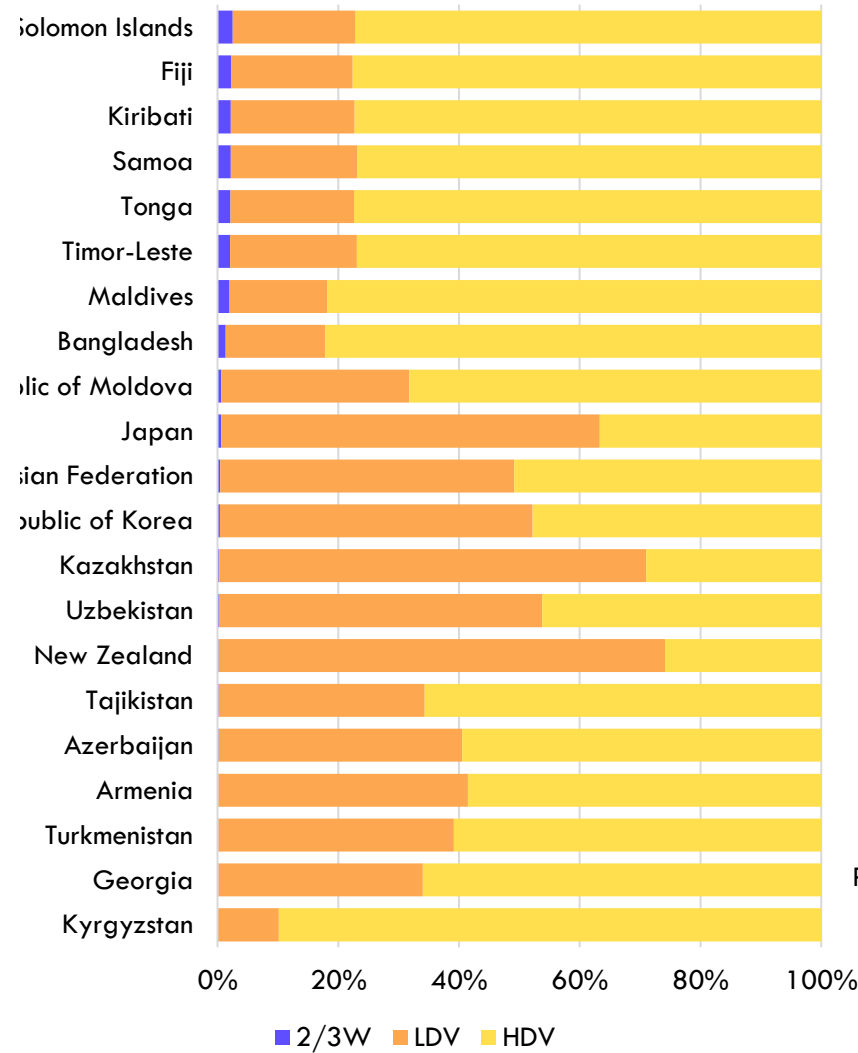
Road share in Transport CO2 Emissions ~ 89% (varies from 72% to 100%)

Decarbonizing Transport: The Need for a Multi-Modal Approach

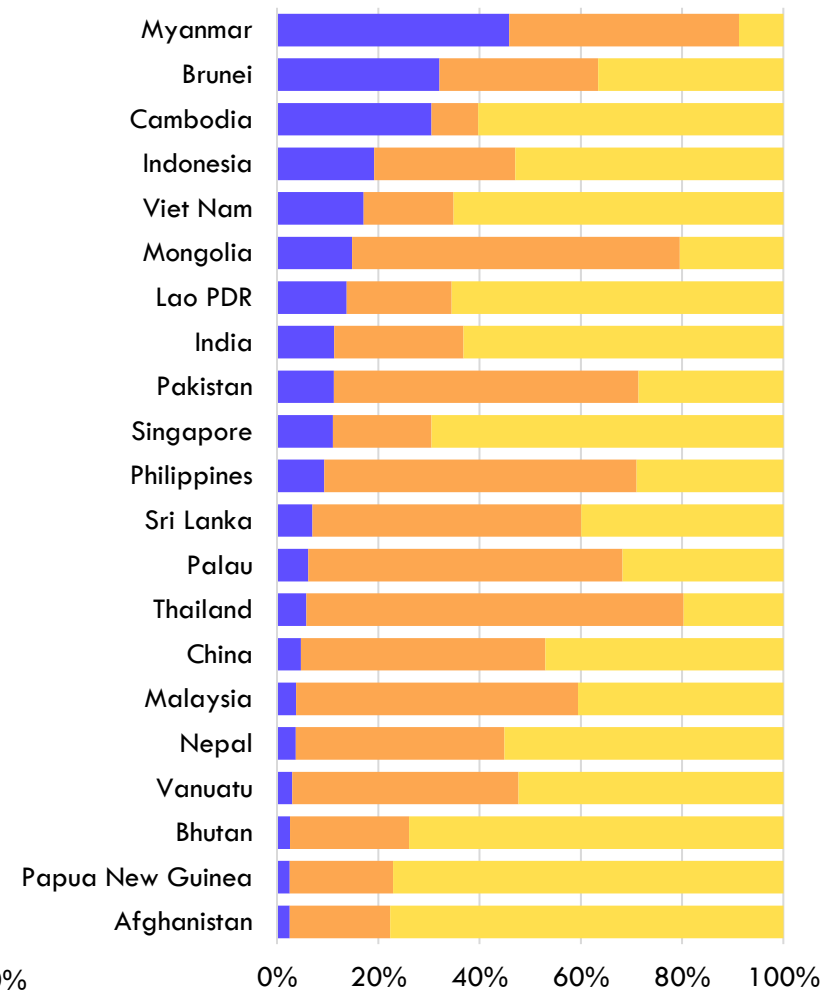
Carbon Efficiency (Passenger), 2019



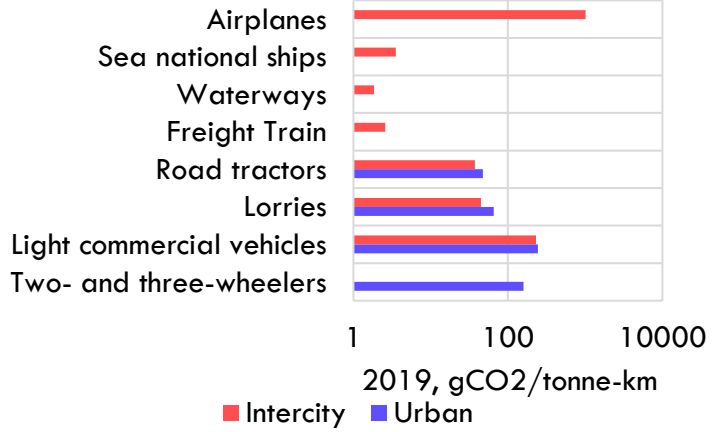
Share of Road Transport CO2 Emissions, 2022 (W2W)



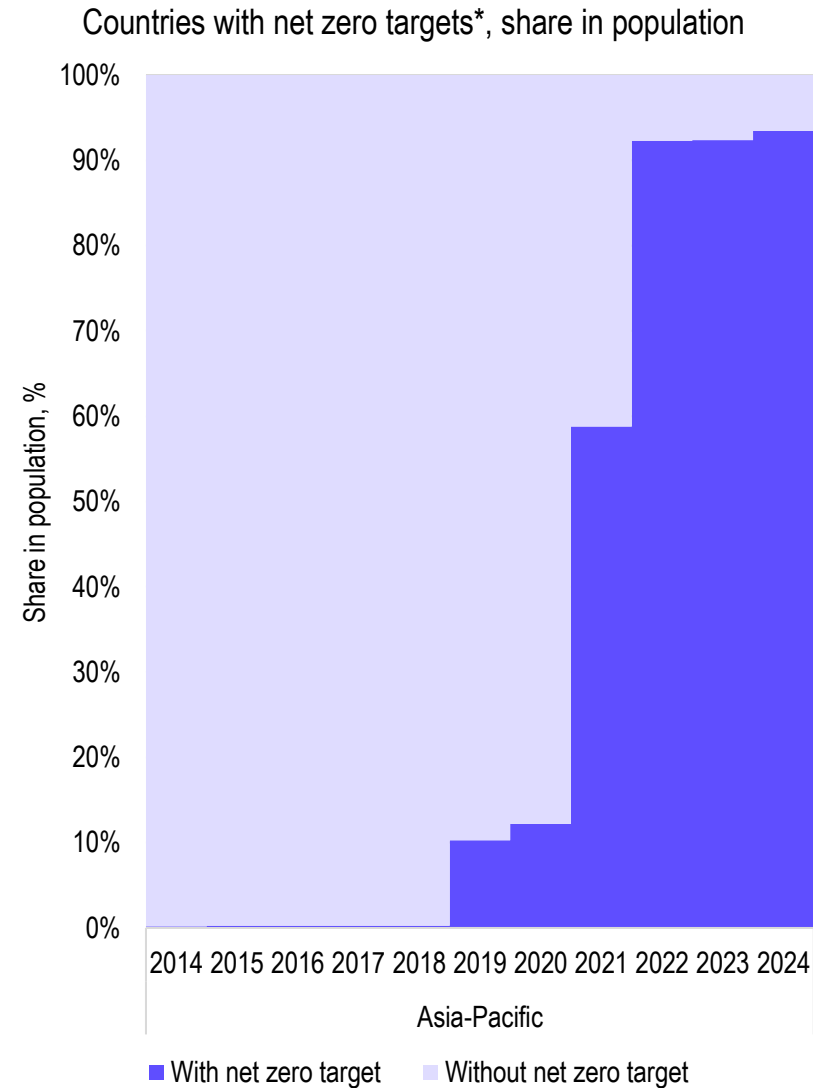
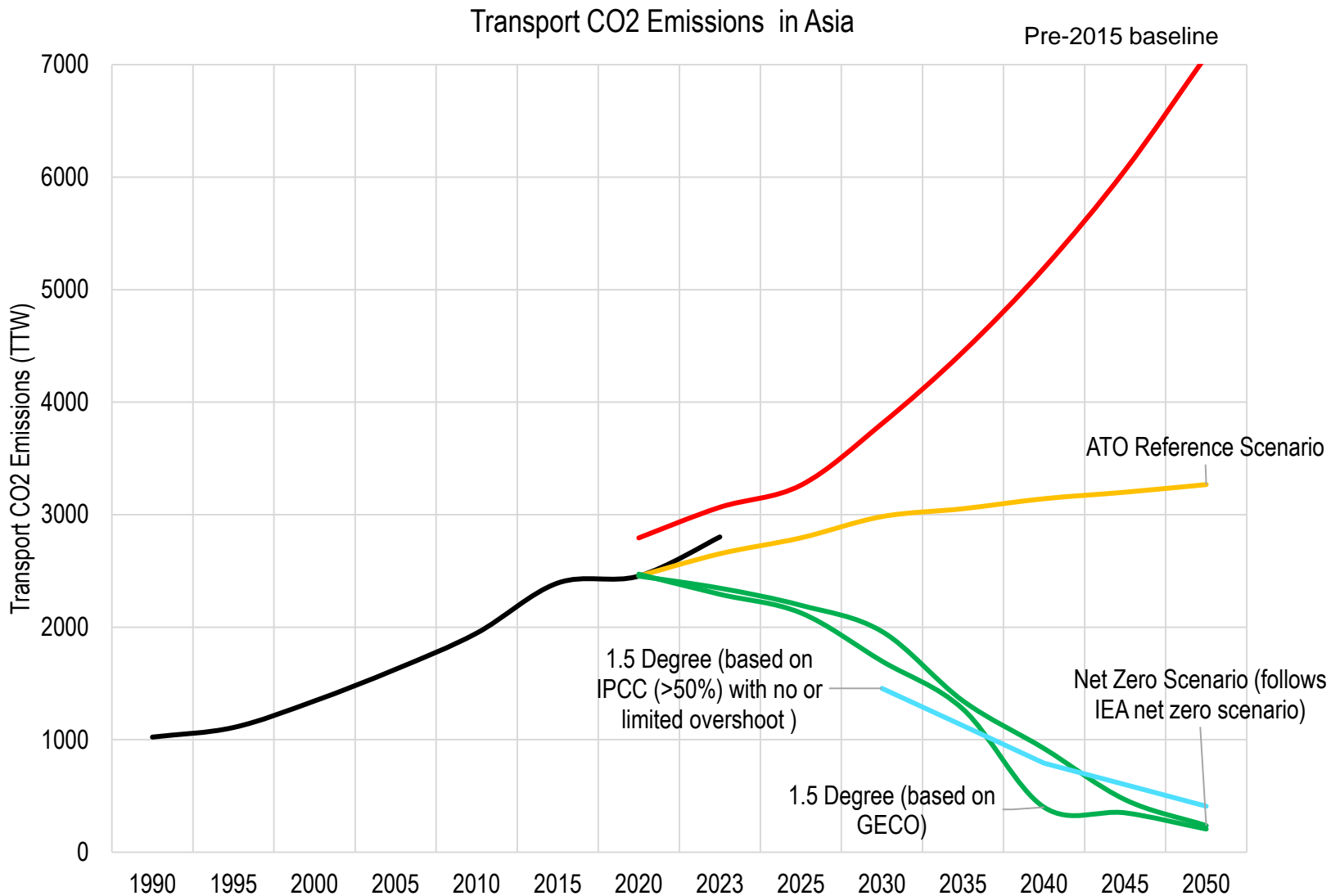
Share of Road Transport CO2 Emissions, 2022 (W2W)



Carbon Efficiency (Freight), 2019

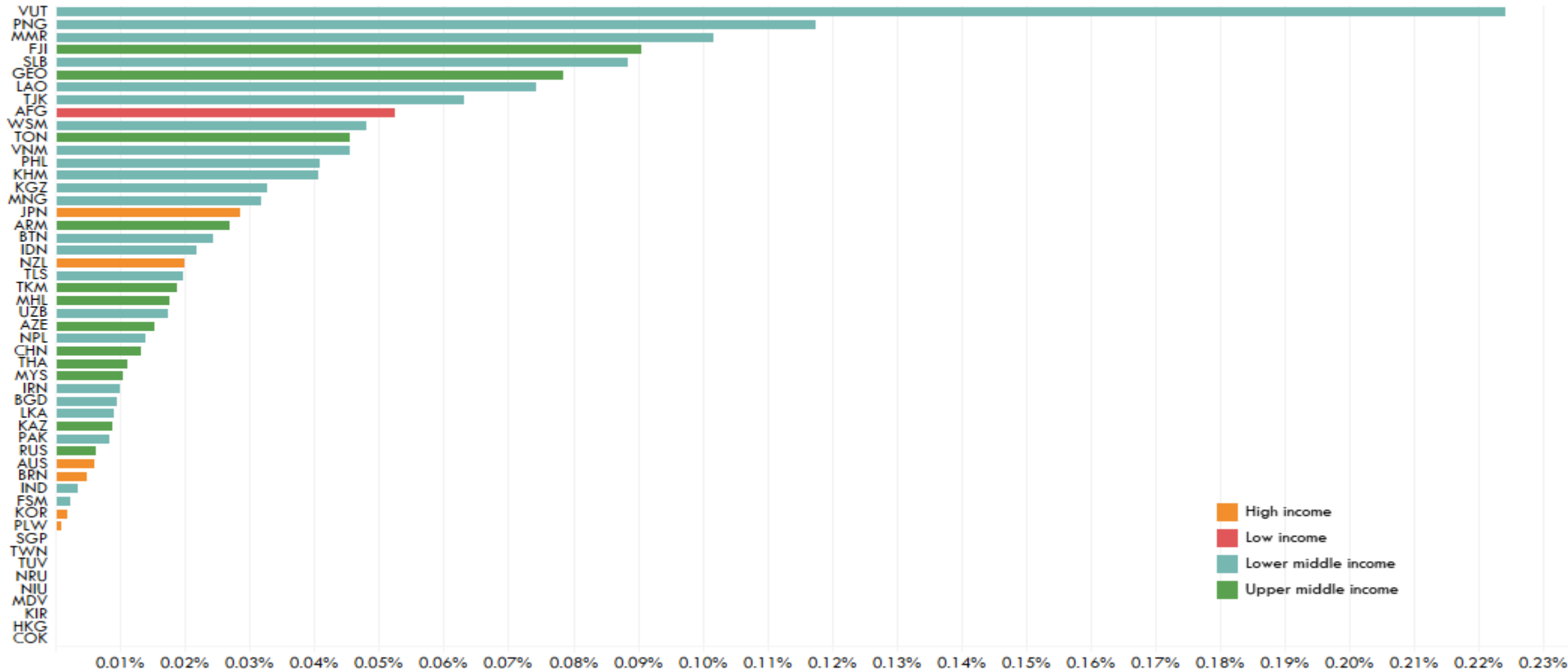


Business as Usual?



Adapting to a Changing World - From Choice to Necessity

Multi-Hazard Expected Annual Damages as % of GDP
(2019)



Road Transport Policies : The Need for Paradigm Shift

LPG, CNG, LNG, and biofuels
 Transport infrastructure
 construction and maintenance
 Transport asset management

<2010

Freight and logistics improvement
 General infrastructure improvement
 Transport asset management
 LPG, CNG, LNG, and biofuels
 Capacity building
 Infrastructure standards
 Vehicle market entry
 Public transport improvement
 Information technology
 Labels
Electrification
 Education
 Transport planning
 Transport finance
Targets
 Infrastructure expansion and maintenance
 Inclusivity measures
 Vehicle management
 Data systems
Vehicle improvement
 Transport demand management
 Transport Laws
 Transport infrastructure construction and maintenance
 Active mobility
 General system improvements

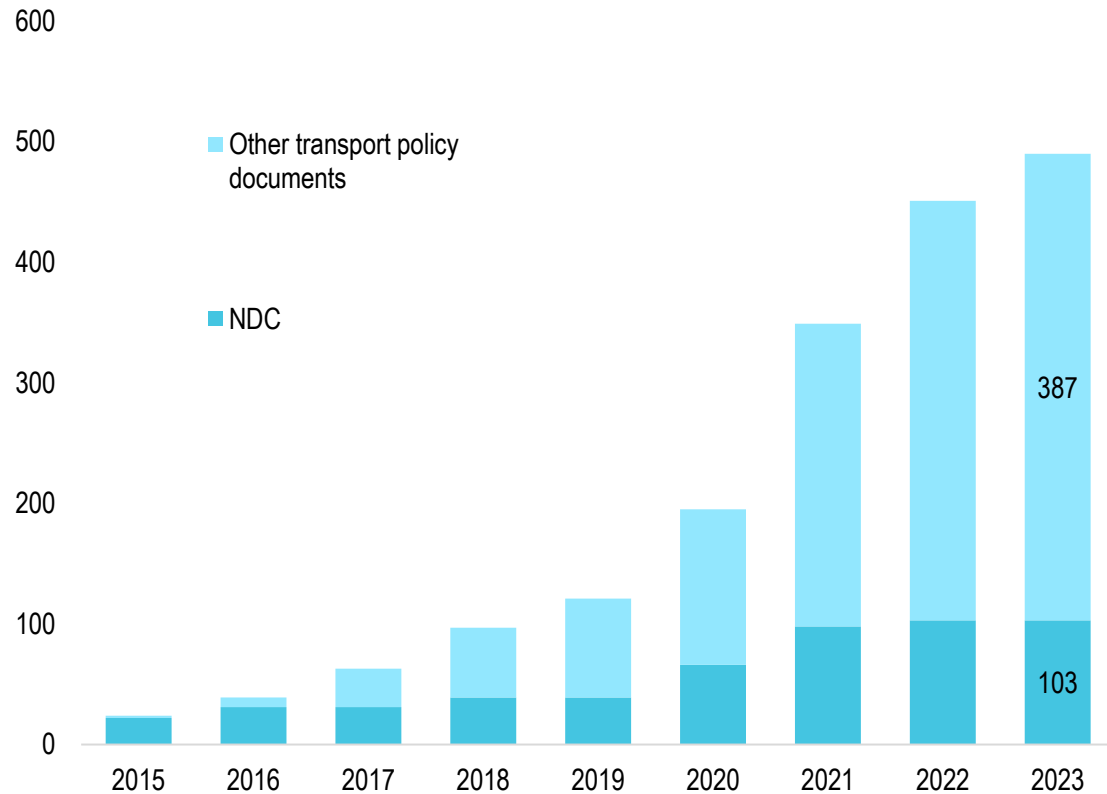
>2010

Count of Topics

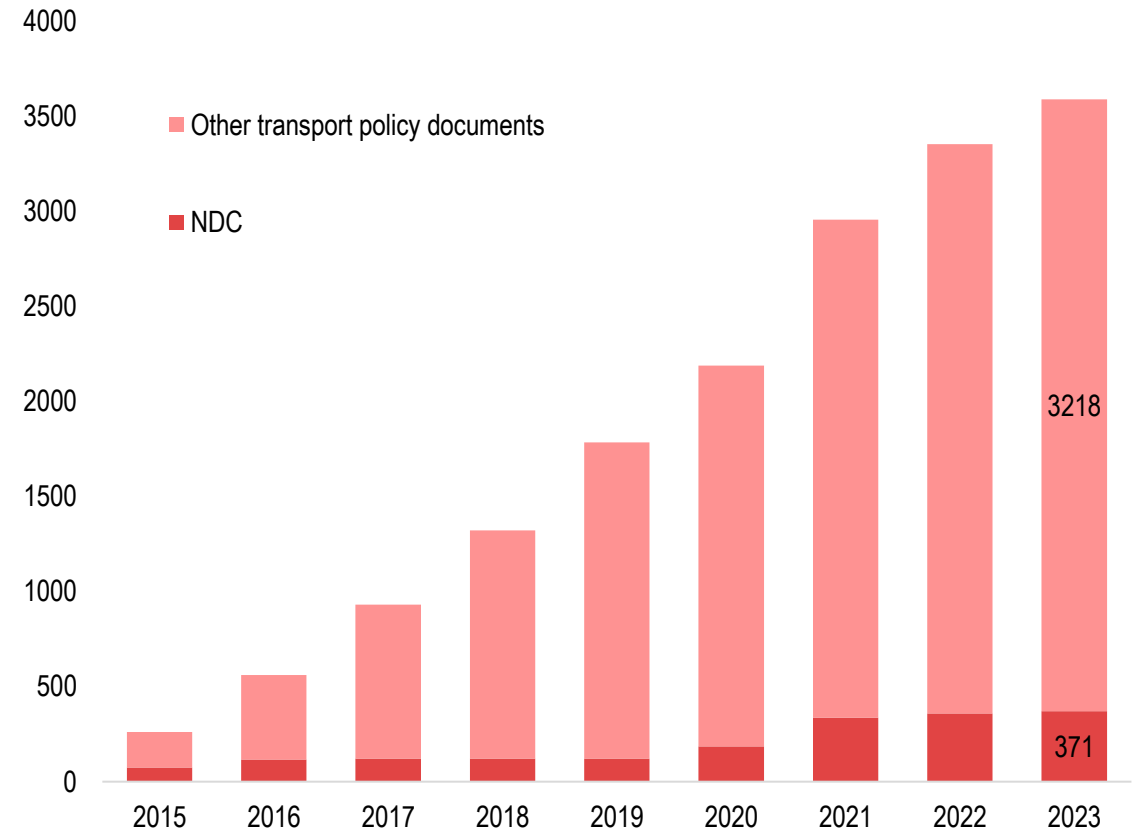
Country	NDC		
	Economy-wide emissions	Transport GHG emission	Indirect transport targets
Azerbaijan	2030		
Bangladesh	2030	2030	Modal shift, transport energy consumption
Bhutan		2030	Vehicle related
Cambodia	2030	2030	
Indonesia	2030		
Kazakhstan	2030		
Kyrgyz Republic	2025, 2030, 2050		
Lao PDR	2030		Biofuels, E-mobility
Malaysia	2030		
Maldives	2030		
Marshall Islands	2025, 2030, 2035	2025, 2030	2025, 2030, 2035
Mongolia	2030	2030	E-mobility
Myanmar	2030		
Nepal			E-mobility, public transport, railway electrification
Pakistan	2030		E-mobility
Papua New Guinea			
Philippines	2030		
Solomon Islands	2025, 2030, 2050		
Sri Lanka	2030	2030	Vehicles scrappage scheme
Tajikistan	2030		
Thailand	2030	2030	
Timor-Leste			
Uzbekistan	2030		E-mobility, LPG/ CNG/ LNG
Vanuatu	2030		Biofuels, E-mobility, Ship, Vehicle efficiency standards
Viet Nam	2030		

NDC's: The Need for Paradigm Shift

Cumulative Distribution of Targets (2015 - 2023)



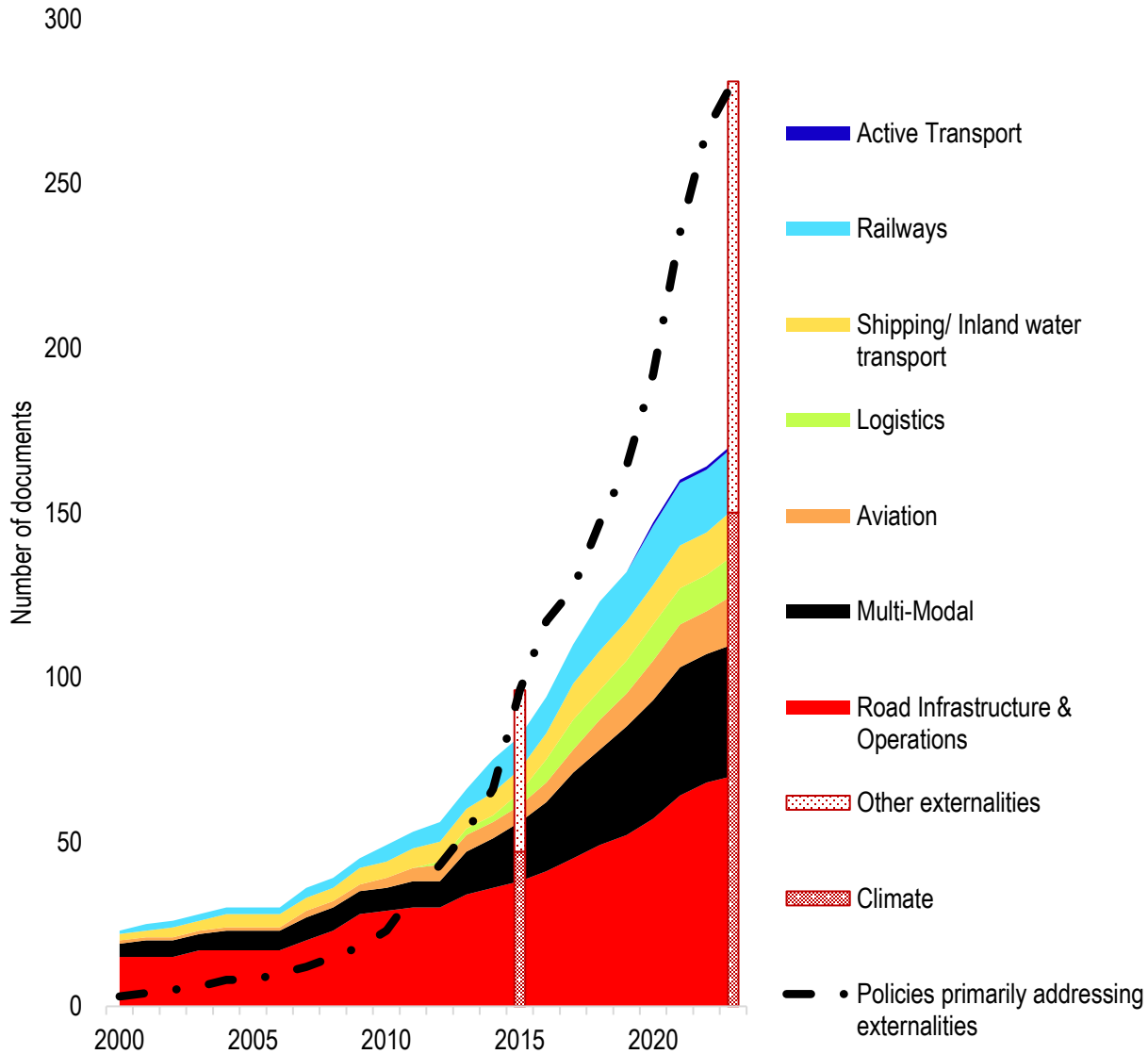
Cumulative Distribution of Measures (2015 - 2023)



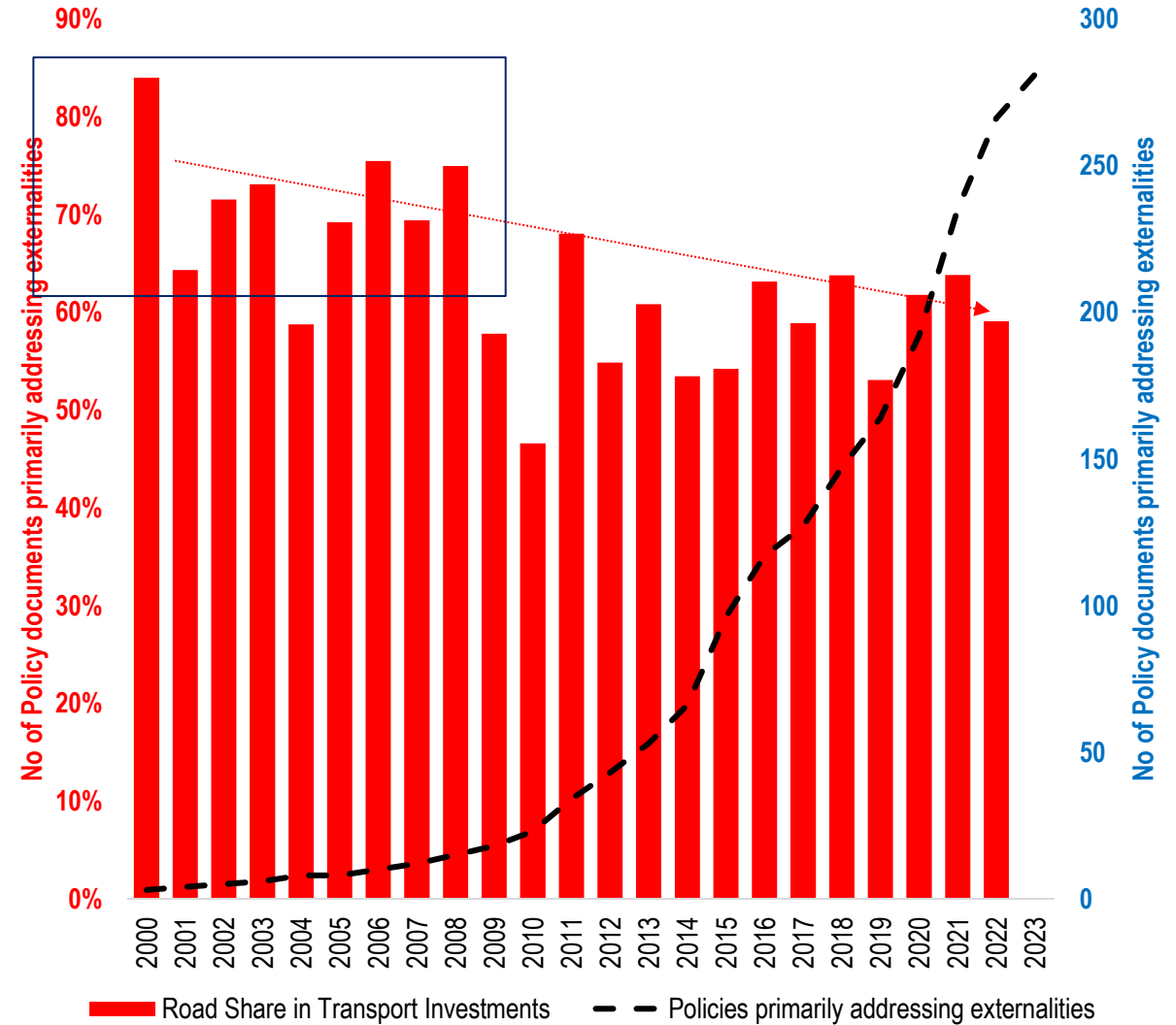
“Emerging economies need more detailed and ambitious transport-related commitments in their NDCs”

The Evolving Landscape of Transport Policies – Less is More

Transport policy documents by theme

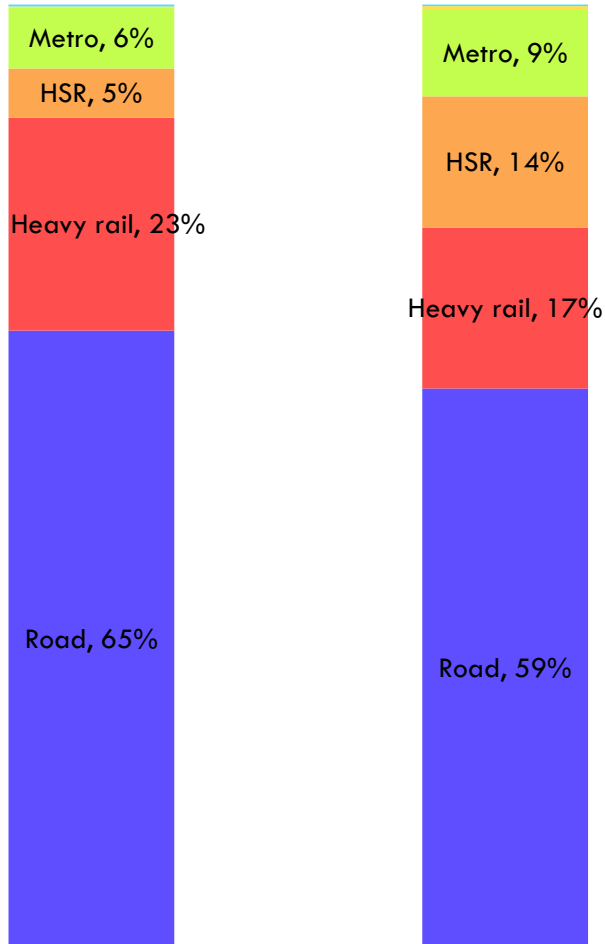


The Evolving Landscape of Transport Policies

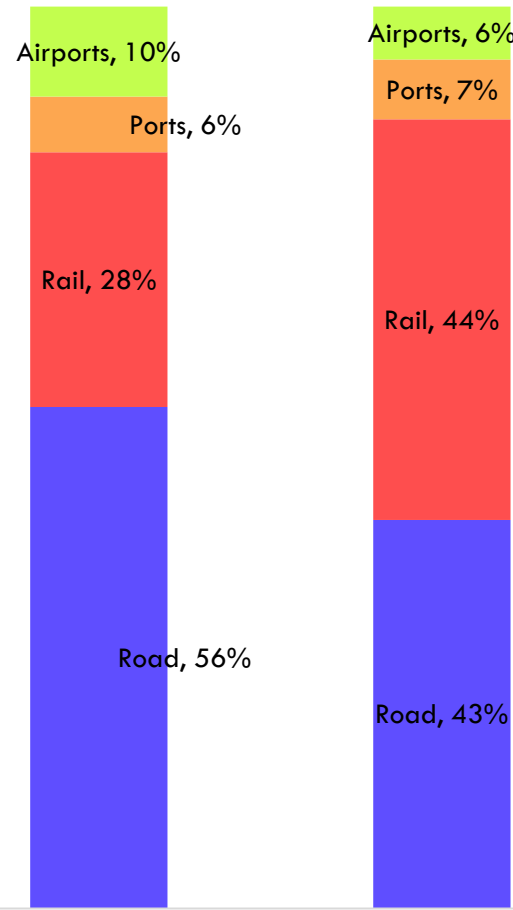


Decarbonizing Transport: The Need for Investments – Less is More

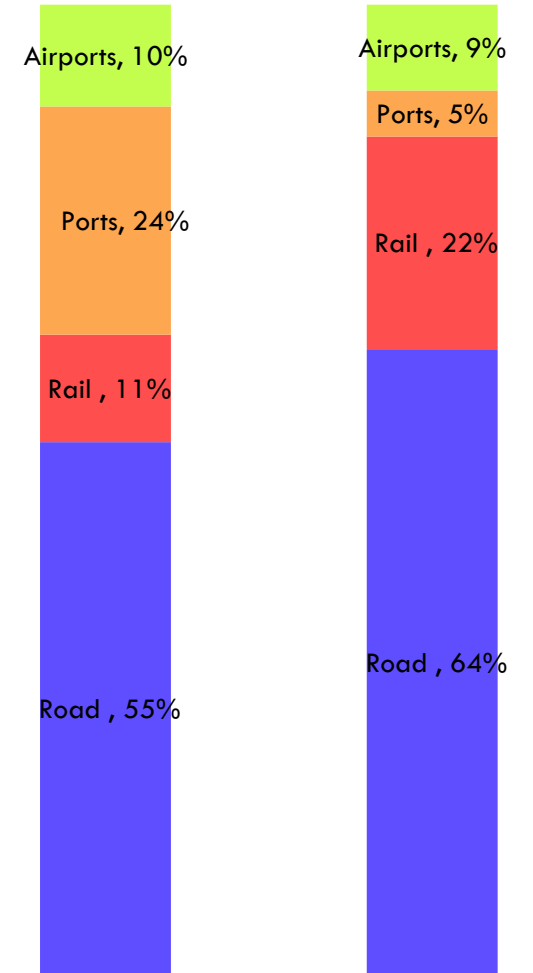
**Transport infrastructure investments
(construction + maintenance)**



**Official development assistance in the
transport sector**

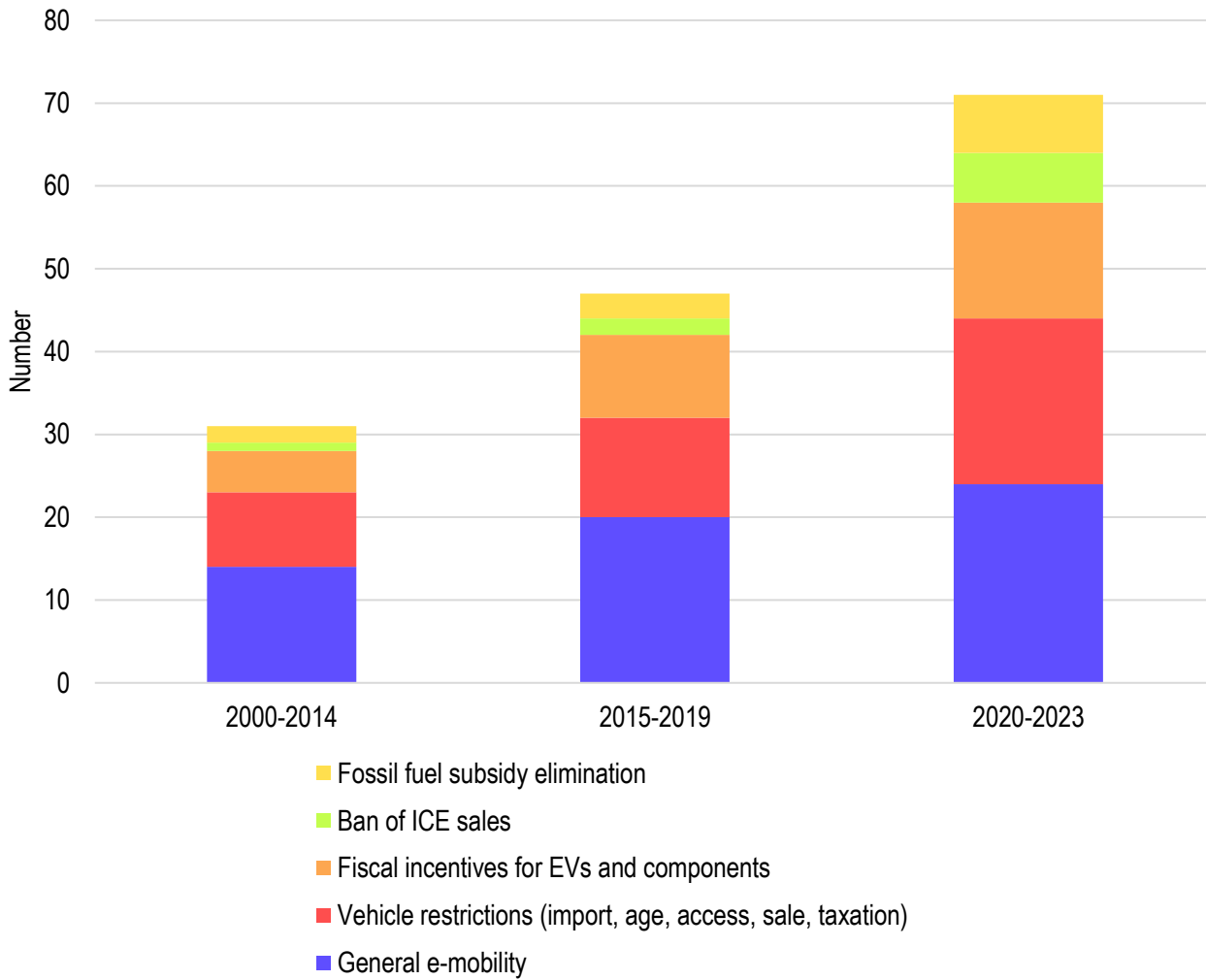


**Public-private partnership
investments in the transport sector**

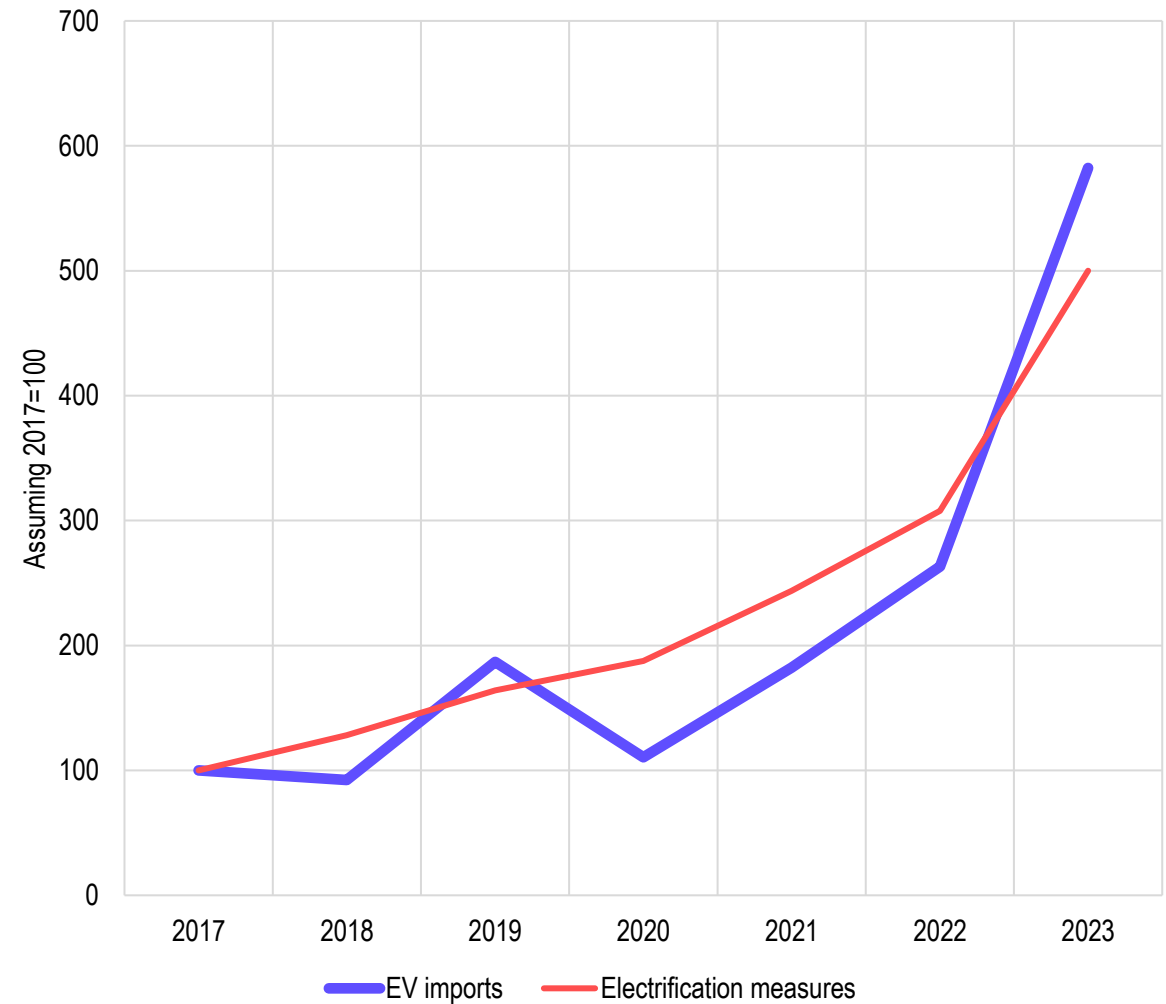


The Future is Electric+ !

Measures and targets on e-mobility in various forms

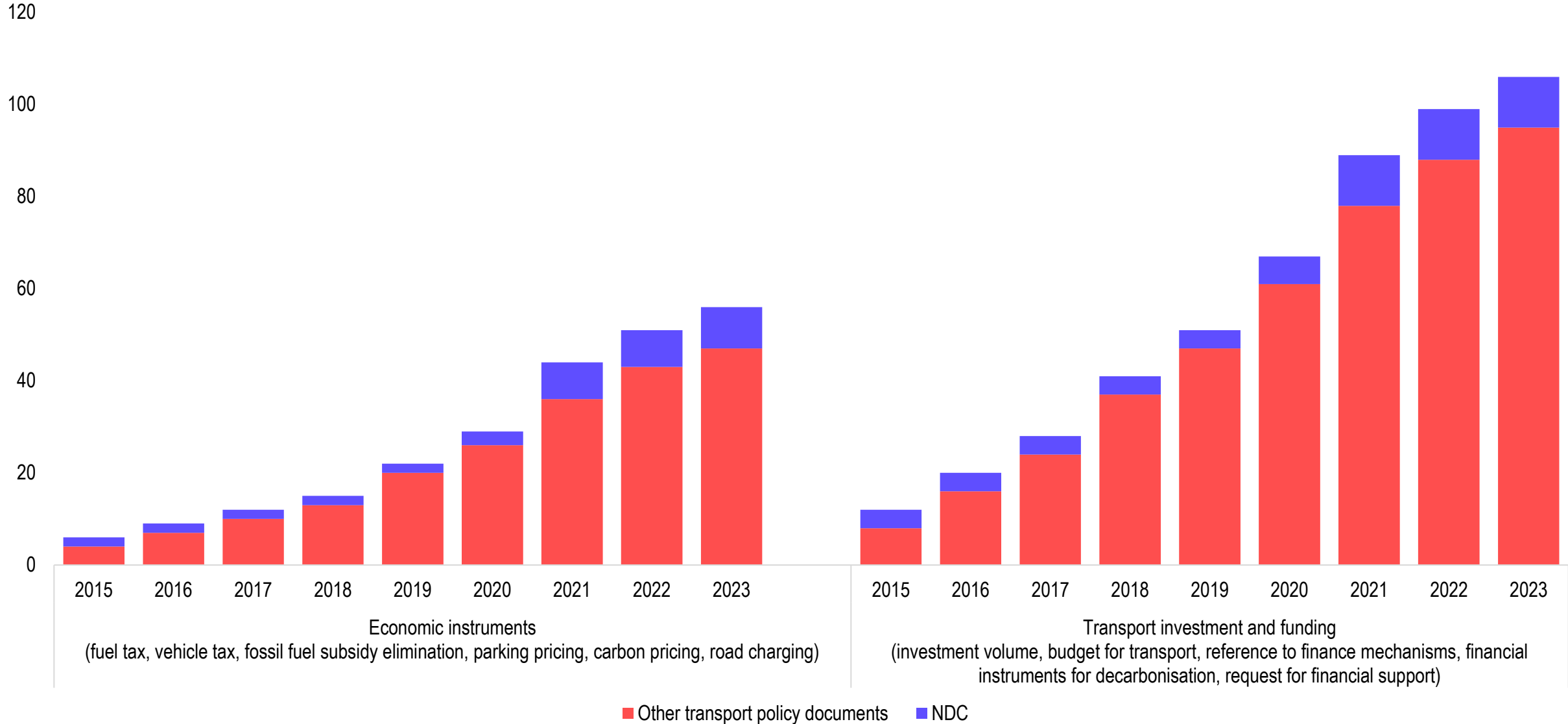


Electric Vehicle Imports and Policies



The Evolving Landscape of Transport Policies

Cumulative number of documents with reference to investment and economic instruments



The Evolving Landscape of Transport Policies

Emphasis on Sustainable Infrastructure Development

Enabling Renewable Energy Sources in the Road Transport Sector

Prioritising Road Asset Management Policy and Strategy

Treating Road Network Investment Plans as One Component of Integrated Multimodal Transport Systems

Promoting Performance-Based Contracts

Adopt a Digital Strategy for Roads

Identifying rural areas with the highest potential for development

Developing Disaster Preparedness Plans

Adopting green solutions in road infrastructure development and operations

Promoting Knowledge Sharing and Regional Transport Initiatives

Navigating Change: The Evolving Landscape of the Road Sector in Asia

Sudhir Gota², Alvin Mejia², Jamie Leather¹, Adwait Limaye², Mel Eden², Nestor Benjamin Soco², Julia Funk³

¹ Asian Development Bank (ADB)

² Asian Transport Outlook

³ International Road Federation (IRF)

Abstract

The decarbonization of Asia's transport sector presents a unique challenge. Despite possessing nearly 60% of the global population and producing half of the global GDP, Asia has only one-third of the world's road network and transport demand. This significant gap hinders access for millions: 25% of the rural population lacks all-season roads, and 75% of urban residents lack efficient public transit. However, Asia's development needs necessitate further growth in the transport sector. This creates a complex tension: how can transport decarbonization be achieved amidst rising road infrastructure development and activity?

This paper examines this "double-edged sword" of Asian road infrastructure. While roads foster access, connectivity, and economic development, they also contribute to road accidents, air pollution, and climate change. In response to the Paris Agreement and Sustainable development goals, many Asian countries are recalibrating their road policies to navigate the complex challenge. This paper analyses over 500 policy documents from 30 Asian economies, exploring key trends and insights. It examines how Asian low and middle-income countries are balancing access expansion, infrastructure development, and innovative economic instruments with efforts to reduce negative externalities.

Introduction

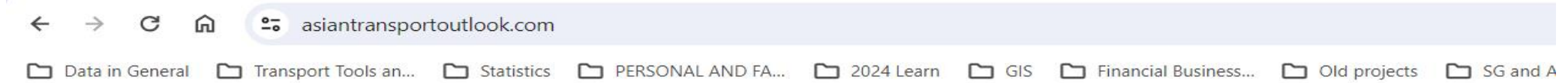
The global shift towards net zero emissions, catalyzed by the 2015 Paris Agreement, has prompted many countries to commit to economy-wide emission reduction targets, including specific goals for the transport sector. In Asia, roughly half of the countries have announced commitments to net zero emissions, necessitating sector-level implementation strategies.

Achieving the Paris Agreement's goal of limiting global warming to 1.5°C necessitates substantial emission reductions across all sectors and regions. While the exact emission cuts required from the transport sector by 2050 remain under discussion, early estimates suggest a target of 0.2 gigatons for Asia's domestic transport. However, this target could be higher depending on the near-term performance of other sectors and regions. Considering its contribution, the road subsector presents the most potential for significant emission reductions within the transport sector.

However, decarbonizing the road sector in Asia presents unique challenges and opportunities distinct from those in other regions. Despite accounting for 60% of the global population and half of the world's GDP in 2022, Asia possesses only one-third of the worldwide road network

1

The Evolving Landscape of Transport Policies



Databases ▾

Analytical Outputs ▾

About ▾

- ATO Reports
- ATO Regional Profiles
- ATO Country Profiles
 - ▶ ATO Transport Sector Profiles
 - ▶ ATO Transport State of Play Presentations
 - ▶ ATO Road Safety Profiles
 - ▶ ATO E-mobility Profiles
 - ▶ ATO Green Roads Profiles
- ATO City Profiles



Green Roads Profile – Connecting Data and Policies

Bangladesh

Green Roads Profile

General

Road length (2022)
149,679 kilometers

Average annual growth rate of road length

Bangladesh's road network is comprised of 5.3% motorways, highways, and primary roads and 94.7% secondary roads, local roads, and other roads.

Road infrastructure availability (2022)
0.9 kilometers per thousand population

Road infrastructure availability trend, kilometers per thousand population

Road infrastructure density (2022)
1,151 meters per square kilometer

Road infrastructure density trend, meters per thousand population

Road infrastructure availability in Asia-Pacific, kilometers per thousand population

Road infrastructure density in Asia-Pacific, meters per square kilometer

Developed with the support of:

Bangladesh

Green Roads Profile

Quality of Life and Fostering Inclusive Growth

Rural access index (2023)
84%

Rural population without access to all-season roads (2023)
17.01 million

National street network disconnectedness index

Logistics performance index score (2023)
2.6/5

Infrastructure score
2.3/5

Logistics performance index ranking trend

This indicator is a summary scalar measure for street network spread (excluding connectivity of land street networks across the world).

Developed with the support of:

Bangladesh

Green Roads Profile

Policy Measures

Policy document	Year	Road-related measures
National Integrated Multi-modal Transport Policy	2013	Active transport infrastructure expansion, General infrastructure improvements, Vehicle inspection and maintenance, Technical standards for road infrastructure, Transport asset condition assessment, General transport asset management, Road charging and tolls, General economic instruments, General transport finance, Reference to finance mechanisms within country, Implementation of horizontal deflections on roads, Implementation of vertical deflections on roads, Measures to improve rural-urban connectivity, Road infrastructure expansion, Development of road plan/ policy, Development of transport plan/ policy, National road safety strategy, National speed law, Passenger and freight load limits, Auditor's star rating for existing roads for road safety, Auditor's star rating required for new road infrastructure for road safety
National Sustainable Development Strategy 2010-2021	2010	General transport asset management, Measures to improve rural-urban connectivity, Road infrastructure expansion
National Road Safety Strategic Action Plan	2014	Active transport infrastructure expansion, General infrastructure improvements, Road-side vehicle technical checks, Technical standards for road infrastructure, General transport asset management, Request for financial support to develop transport, Implementation of vertical deflections on roads, Upgrading high risk locations for road safety, National road safety strategy, Auditor's star rating for existing roads for road safety, Auditor's star rating required for new road infrastructure for road safety

Vehicle inspection and maintenance, National speed law, Passenger and freight load limits, Road-side checks on overloading

Active transport infrastructure expansion, Road charging and tolls, Investment required for specific projects, Reference to finance mechanisms within country, Road infrastructure expansion, Development of transport adaptive/ emergency/ disaster plan/ policy, Development of transport plan/ policy, Adaptation transport laws, regulations and programmes

Active transport infrastructure expansion, Reduction of transport/ logistics costs, Transport infrastructure resilience, General transport asset management, Fossil fuel subsidy elimination, General transport finance, Investment required for specific projects, Road infrastructure expansion, Development of transport plan/ policy

Active transport infrastructure expansion, General infrastructure improvements, Vehicle inspection and maintenance, Technical standards for road infrastructure, Routine transport asset maintenance, General transport asset management, Road charging and tolls, Vehicle taxes, General economic instruments, General transport finance, Investment volume for transport, Reference to finance mechanisms within country, Request for financial support to develop transport, Measures to improve rural-urban connectivity, Road infrastructure expansion, Development of road plan/ policy, Passenger and freight load limits, Road-side checks on overloading

Active transport infrastructure expansion, General infrastructure improvements, Technical standards for road infrastructure, Target - Transport activity, Asphalt mix resurfacing, General transport asset management, Fuel tax, Road charging and tolls, General transport finance, Reference to finance mechanisms within country, Measures to improve rural-urban connectivity, Road infrastructure expansion, Passenger and freight load limits

Active transport infrastructure expansion, General infrastructure improvements, Vehicle inspection and maintenance, Technical standards for road infrastructure, General transport asset management, Reference to finance mechanisms within country, Measures to improve rural-urban connectivity, Road infrastructure expansion, Road infrastructure expansion, Ecodriving

Design standards for sidewalks and bicycle paths, Upgrading high risk locations for road safety, National road safety strategy, National speed law, Auditor's star rating for existing roads for road safety, Auditor's star rating required for new road infrastructure for road safety

Developed with the support of:

Bangladesh

Green Roads Profile

Transport Sector Employment

Share of transport sector in total employment (2022)
9.5%

Share of females in total transport sector employment (2022)
4.8%

Percent of firms choosing transportation as their biggest obstacle - Manufacturing (2007)
0.1%

Percent of respondents answering high/very high - Level of Fees and Charges on Road transport (2014)
57.9%

Level of fees and charges for less than full Truck loads are considered

Mean speed in Asia-Pacific, kilometers per hour (2022)

77% of Bangladesh's transport energy consumption is in the road sector.

Road transport energy intensity with GDP, Tj per USD (PPP)

Between 2010-2020, road transport energy consumption grew 2.7% annually.

Asia-Pacific average is 0.4 Tj per USD in 2020

Developed with the support of:

Bangladesh

Green Roads Profile

Disaster Preparedness

Road infrastructure due to National road vulnerability index ranking (2023)
191st out of 208 countries

Share of population in low elevated coastal zones (2018)
8.9%

Structure in multihazard structure (2023)

Management, Preserving Biodiversity, and Sustainable Materials

Thousand tonnes (2000-2018)

In 2022, road transport contributed 6.3%, re-suspended dust contributed 6.9% in transport PM10 emissions. In total, road transport contributed about 2.5% in total PM10 emissions in Bangladesh.

Deaths due to occupational exposure to diesel engine exhaust (2000-2010)
916 deaths

Share of biofuels in road transport energy consumption (2020)
n.d.

Domestic consumption per capita, tonnes (2024)
3.8 tonnes

Domestic consumption is the total amount of materials directly used in the economy (excluding domestic extraction plus imports), minus the materials that are exported.

Terrestrial and marine protected areas (2022)
4.9%

Terrestrial protected areas
4.6%

Marine protected areas
5.4%

Forest area (2021)
14.5%

Developed with the support of:

Bangladesh

Green Roads Profile

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Design standards for sidewalks and bicycle paths, Upgrading high risk locations for road safety, National road safety strategy, National speed law, Auditor's star rating for existing roads for road safety, Auditor's star rating required for new road infrastructure for road safety

Developed with the support of:

Bangladesh

Green Roads Profile

Road User Charge Revenues

Road user charge	Revenue (million USD)
Tax on sale of vehicle	1,200.0
Vehicle registration fee	94.0
Motor vehicle tax	115.0
Fuel tax	3,900.0
Road toll	101.0

Actual maintenance budget: 3,702 million USD

Maintenance budget deficit: 583 million USD

Length

Length	Paved	Good	Fair	Quality Poor	Very Poor
3,991	93%	76%	17%	4%	3%
4,898	4%	81%	12%	4%	4%
13,568	4%	75%	13%	7%	6%
36,712	93%				
41,880	78%				
133,861	40%				
160,482	23%				

Source: Development Bank, 2024. The Future of Road Law Changing in Developing Asia and the Pacific: Recovery Options

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

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