

ACHIEVING SDGs AND CLIMATE GOALS THROUGH CLEANER FUELS AND VEHICLES AND IMPROVED FUEL ECONOMY

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National Workshop on
Developing Clean and Efficient Vehicle Policy for Bangladesh

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About Clean Air Asia

Clean Air Asia is an international NGO that was established as the premier air quality network for Asia by the Asian Development Bank, World Bank and USAID in 2001, and operates since 2007 as an independent non-profit organization.

Clean Air Asia works towards achieving better air quality and livable cities by translating knowledge to policies and actions to reduce air pollution and greenhouse gas emissions from transport, energy, other sectors.

Clean Air Asia works on the issues that matter the most for better air quality.



Air Quality and Climate Change

- ❖ Transboundary Haze
- ❖ Stationary sources
- ❖ Indoor air pollution
- ❖ Mobile Sources



Sustainable Transport



Low Emission Urban Development



Green Freight and Logistics



CITIES FOR CLEAN AIR
CERTIFICATION

City Certification



Clean Fuels and Vehicles

What we do!

We reduce air pollution and greenhouse gas emissions by

Building capacity

Informing stakeholders about air pollution, its links to climate change and sustainability

Advocating for the development and implementation of effective and appropriate policies and practices

Disseminating data and knowledge

- Headquartered in the Philippines
- Offices in China & India
- Country networks in Indonesia, Nepal, Philippines, Sri Lanka, Vietnam and Malaysia

CO₂ emissions from transport

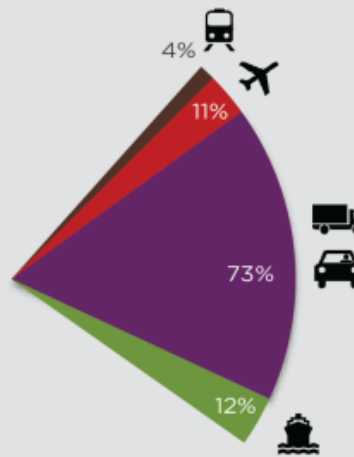
THE TRANSPORTATION SECTOR

A major contributor to global energy-related CO₂ emissions

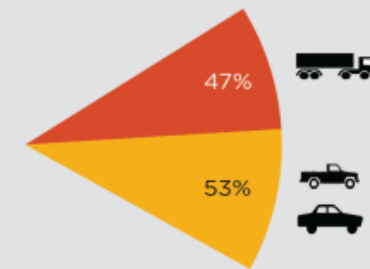
GLOBAL ENERGY-RELATED EMISSIONS
≈ 30 Gt CO₂



TRANSPORT EMISSIONS
≈ 7 Gt CO₂



ROAD TRANSPORT EMISSIONS
≈ 5 Gt CO₂



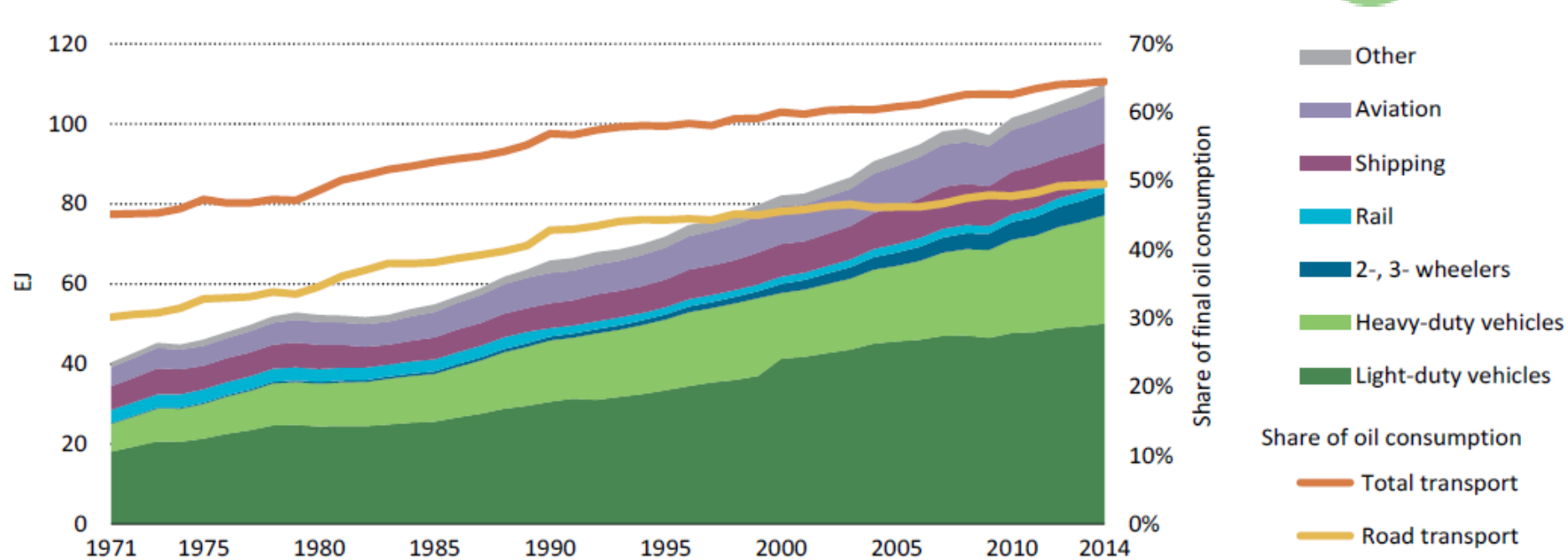
LEGEND

- RAIL
- AIR
- ROAD
- SEA
- HEAVY-DUTY VEHICLES
- LIGHT-DUTY VEHICLES

Sources:
ICCT (2014). Global Transportation Roadmap Model. Version 2.0. More information available at <http://www.theicct.org/global-transportation-roadmap-model>.
IEA (2012). CO₂ Emissions from Fuel Combustion: Highlights. 2012 edition. Retrieved from <https://www.iea.org/co2highlights/co2highlights.pdf>.

Energy consumption in transport

World transport energy use by mode, 1971-2014



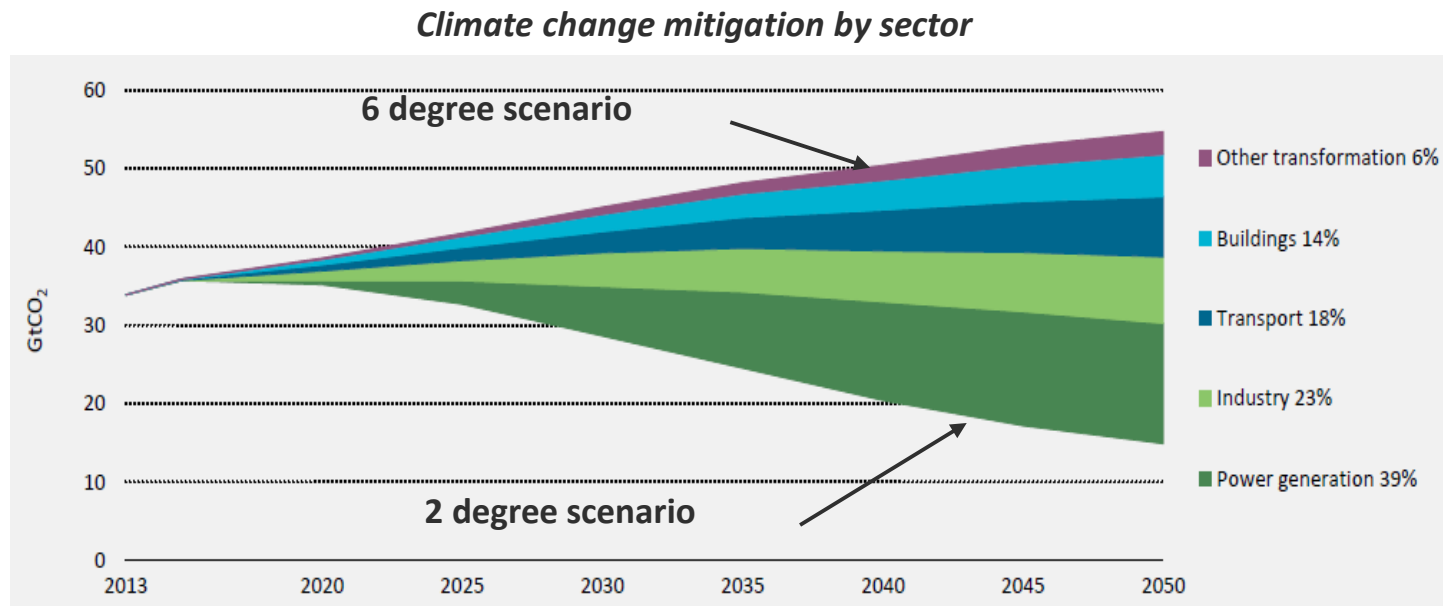
Road transport modes account for most energy consumption.

The share of road in total transport final oil use has grown from 30% in 1971 to 50% in 2014.

Sources: IEA World Energy Balances, 2015 and ETP 2017

© IEA 2017

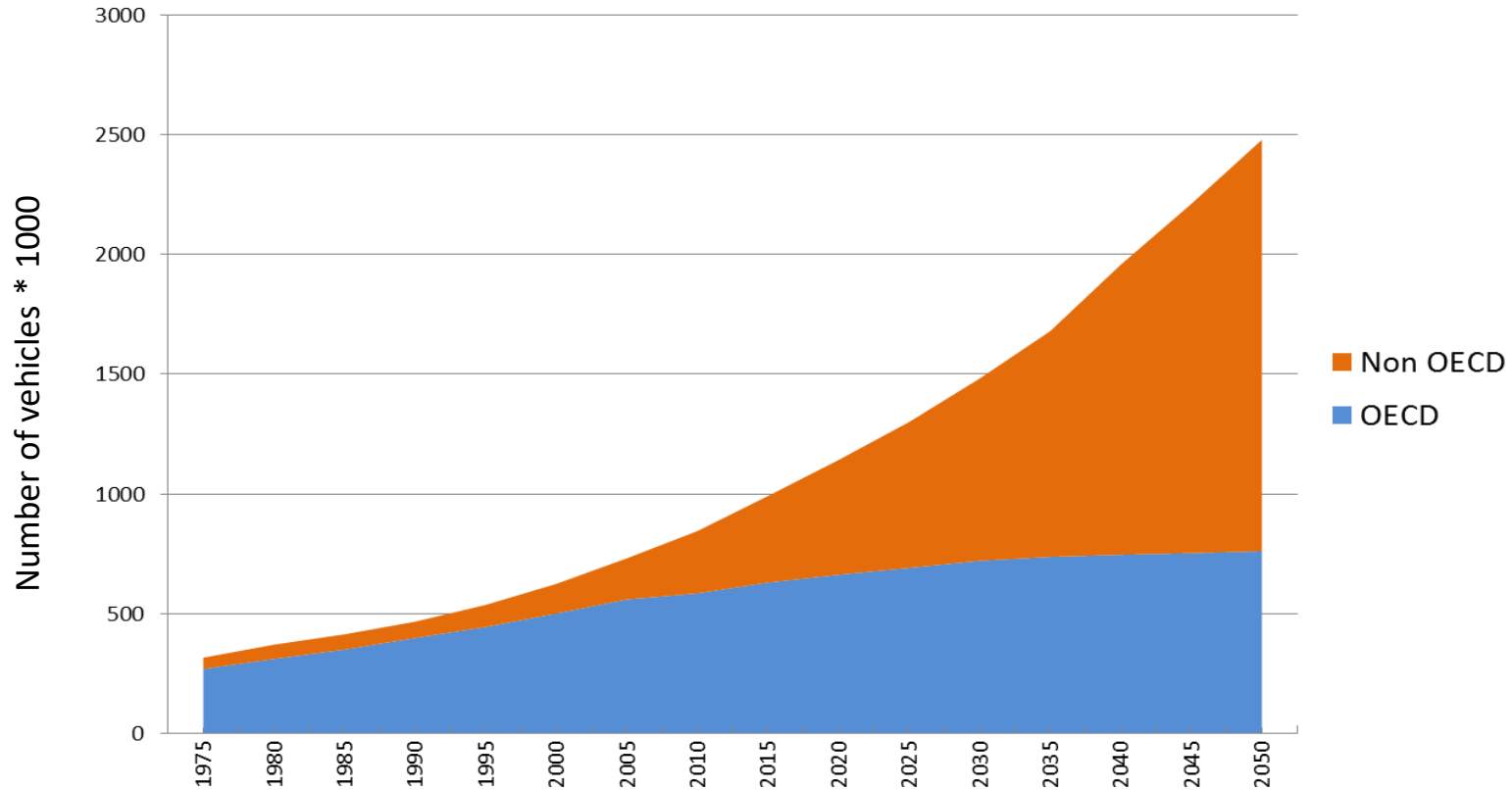
Transport and climate change



Source: *Energy Technology Perspectives 2016 (IEA 2016)*

- **Transport needs to contribute 18% to global carbon emission reductions to reach a 2DS**
- **Most of the vehicle fleet growth will take place in non-OECD countries**
- **Climate targets cannot be reached without contribution from developing & transitional countries**

Motor vehicles ~1 billion today... over 2.5 billion by 2050



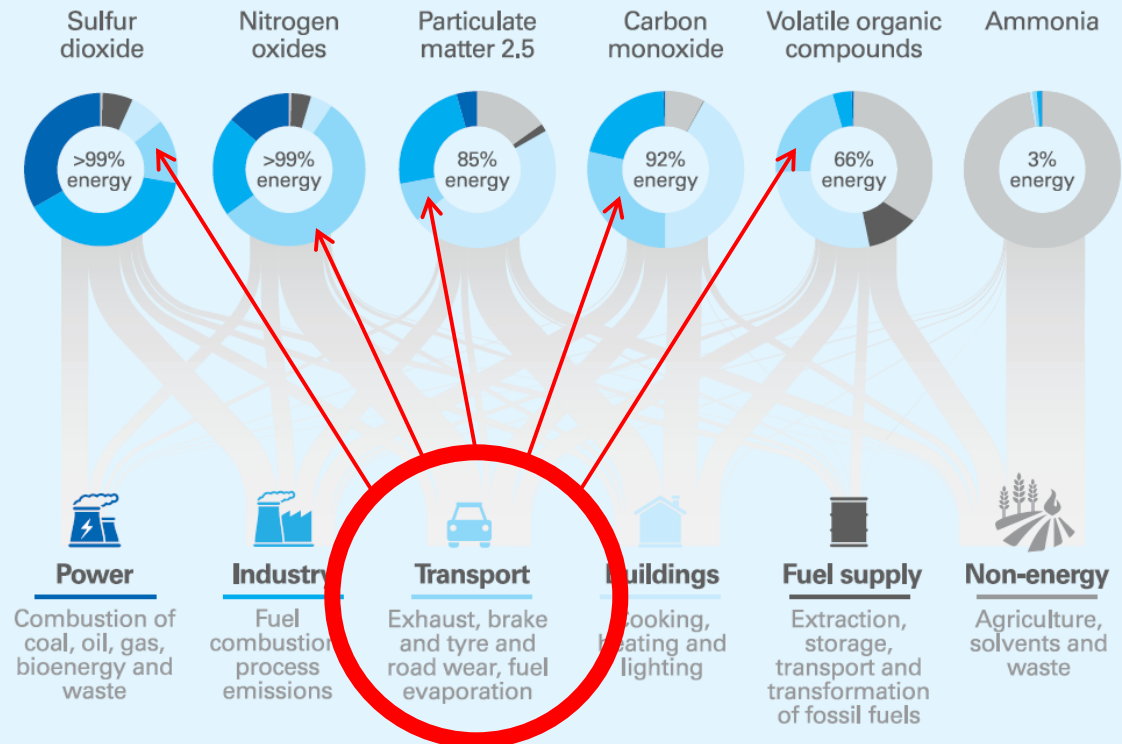
- 90%+ of growth in developing, emerging economies
- Opportunity for energy efficiency, green economy innovation

Transport and air pollution

Transport accounts for:

- More than half of global NO_x emissions
- More than a quarter of all CO emissions
- Almost a quarter of volatile organic compounds emissions
- Substantial shares of SO_2 and PM emissions

Fig. 4: Selected primary air pollutants and their sources, 2015



Source: Energy and Air Pollution, *World Energy Outlook Special Report*, International Energy Agency, 2016

Global Fuel Economy Initiative



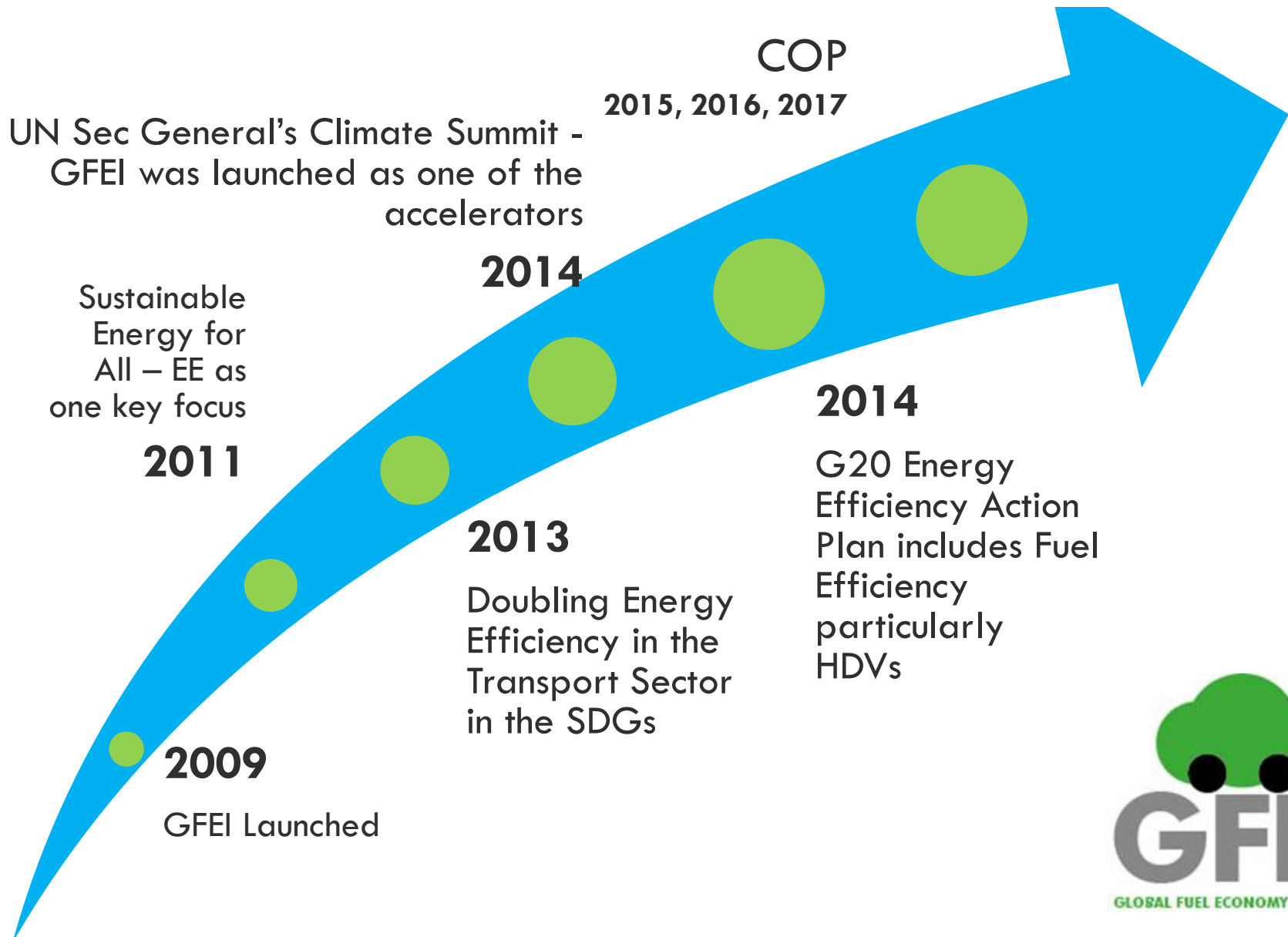
DOUBLE AVERAGE FUEL ECONOMY

OF NEW CARS BY 2030
AND ALL CARS BY 2050



Strong fuel economy improvements could yield a 50% reduction in fuel use per km for new cars by 2030.

GFEI at the global stage



Global Fuel Economy Initiative (GFEI)

Doubling the efficiency of the global car fleet by 2050

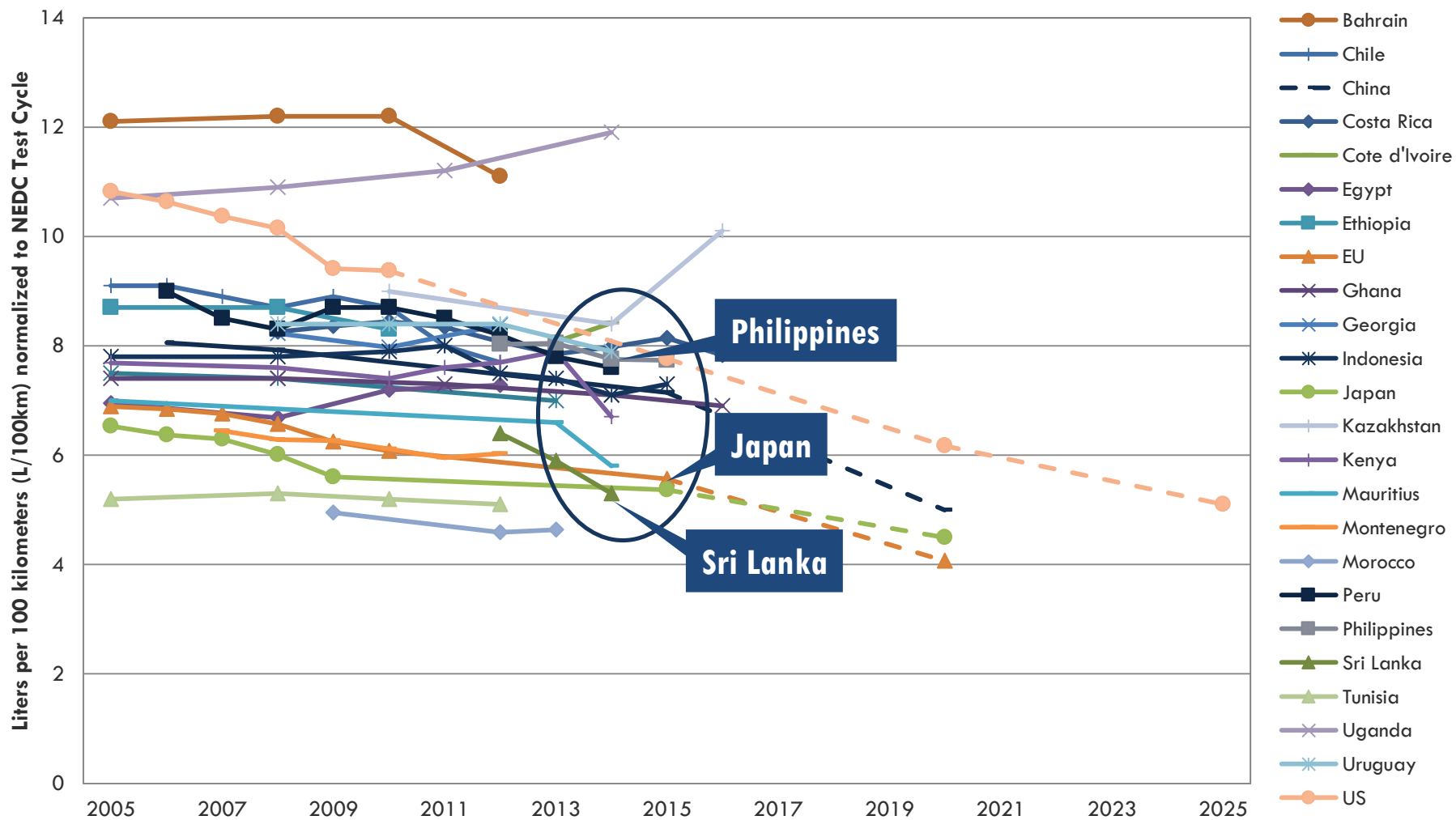


Regional Environment Center



High average fuel economy in most developing countries and no policies

Baseline Light-Duty Vehicle Fuel Economy and Trends



Source: UNEP, 2018(unpublished).

Doubling the efficiency of global car fleet by 2050



			2005	2008	2010	2012	2014	2015	2030
OECD & EU average	average fuel economy (Lge/100km)		8.8	8.2	7.8	7.6	7.4	7.3	
	annual improvement rate (% per year)		-2.3%	-2.8%	-1.6%	-1.3%	-0.5%		
			-1.8%						
Non-OECD average	average fuel economy (Lge/100km)		8.5	8.5	8.4	8.2	8.0	7.9	
	annual improvement rate (% per year)		-0.1%	-0.3%	-1.4%	-1.2%	-1.6%		
			-0.8%						
Global average	average fuel economy (Lge/100km)		8.8	8.3	8.1	7.8	7.6	7.6	4.4
	annual improvement rate (% per year)		-1.8%	-1.6%	-1.3%	-1.3%	-1.1%		
			-1.5%						
GFEI target	required annual improvement rate (% per year)	2005 base year	-2.8%						
		2015 base year	-3.7%						

- Slowing improvement in OECD countries
- Increasing improvement in non-OECD but not enough
- Still far from meeting the GFEI target

Baseline development

- Developing policy options towards energy efficiency improvements in the road transport sector requires a thorough **understanding of the vehicle fleet going into the country**, or the said baseline development, for target-setting and policy development
- This would refer to data on **newly registered vehicles** that cover both **brand-new** vehicles and **newly registered imported used** vehicles for a certain baseline year

Fuel economy baseline development

What is fuel economy?

Fuel economy, fuel efficiency, fuel intensity are all fairly interchangeable terms, but fuel economy always refers to **fuel use** relative to **distance** travelled.

Vehicles use energy, and fuel economy measures energy per unit of vehicle travel.

- liters per 100 km (Europe)
- miles per gallon (USA)
- km per liter (Japan)

Fuel economy baseline development

- The fuel economy baseline is the weighted average fuel economy of all vehicles *registered for the first time* in a given year in a country
- The weighted average fuel economy is calculated using model-specific fuel economy values and the number of registered vehicles as weight

Fuel economy policy options

VEHICLE FUEL EFFICIENCY STANDARDS

- Introduce and regularly strengthen mandatory standards
- Establish and harmonize testing procedures for fuel efficiency measurement.

FISCAL MEASURES

- Fuel taxes and vehicle taxes to encourage the purchase of more fuel-efficient vehicles.
- Infrastructure support and incentive schemes for very fuel-efficient vehicles.

MARKET-BASED APPROACHES

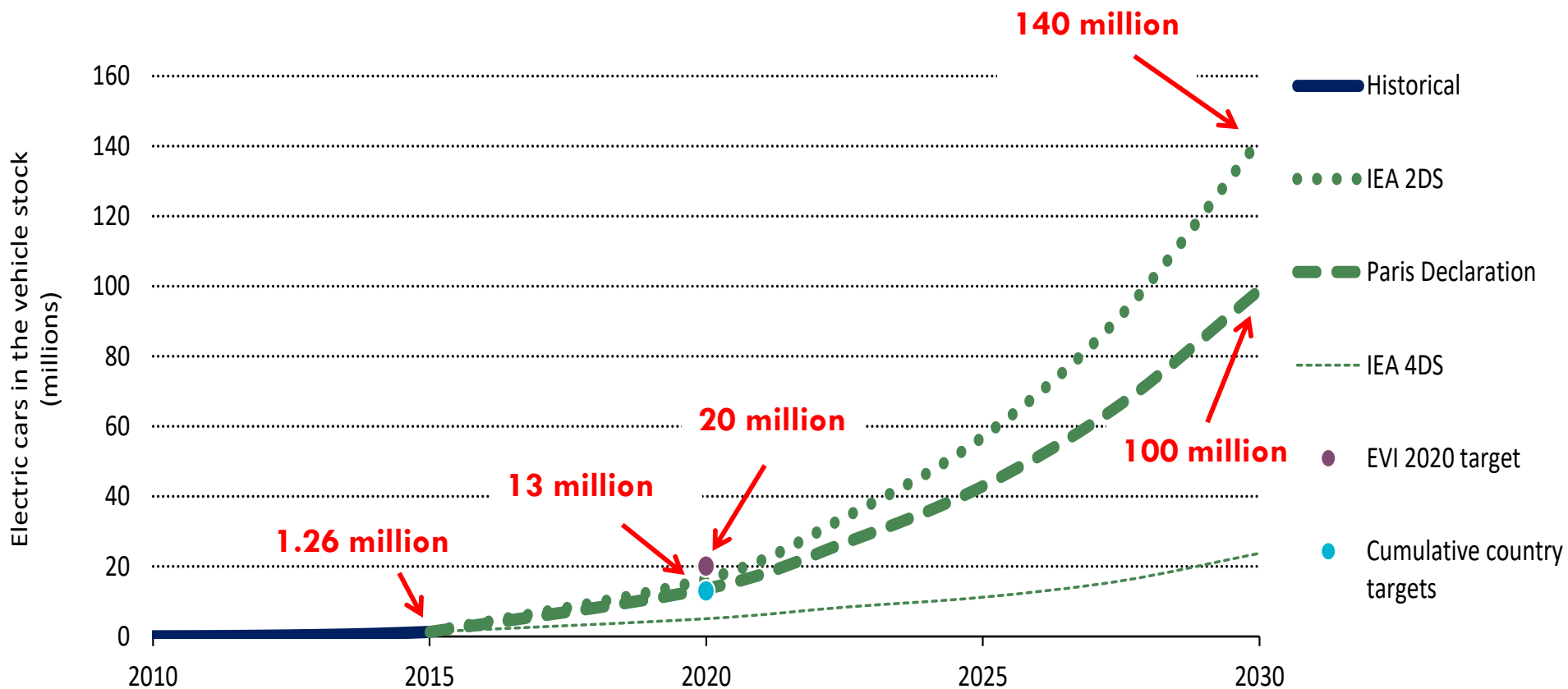
- Voluntary programs such as U.S. SmartWay and other green freight programs

INFORMATION MEASURES

- Vehicle fuel economy labels
- Improving vehicle operational efficiency through eco-driving and other measures.

Potential for electrification to meet target

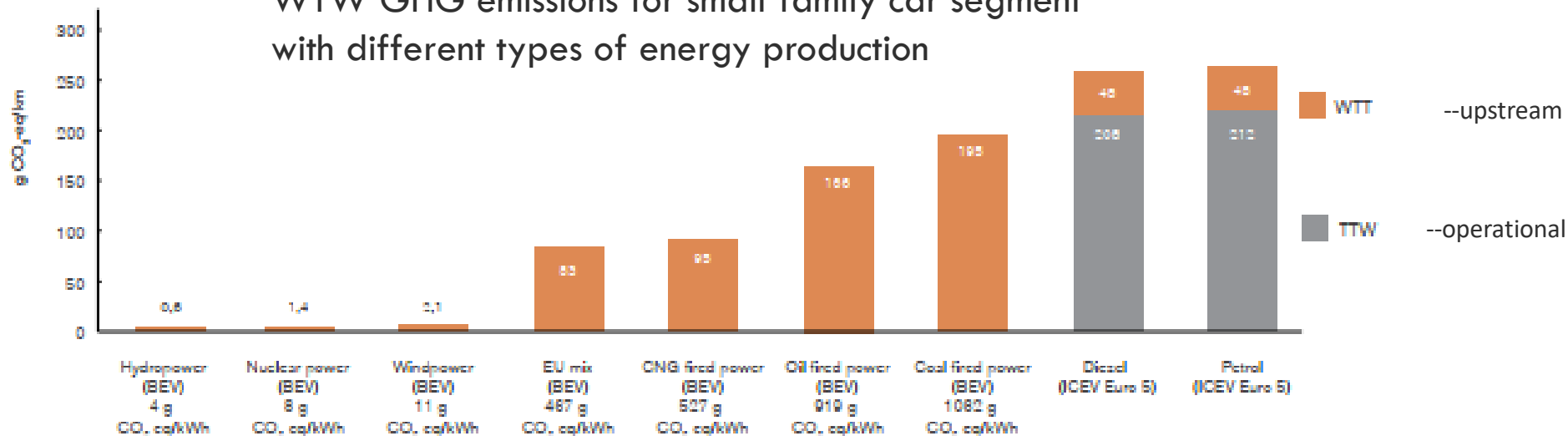
To meet $\leq 2^\circ\uparrow$ scenario, 20% of all road vehicles must be electric-powered by 2030 (IEA).



Projections indicate that a MAJOR disruption is needed to increase electric mobility uptake

GHG emissions and different energy production

WTW GHG emissions for small family car segment with different types of energy production



EVs have been analyzed and compared against different types of fuels using the WTW approach.

WTW analysis often separated into two stages:

- Well to Tank (WTT) – upstream phase from production (e.g. extraction of energy feedstock)
- Tank to Wheel (TTW) – operational phase of vehicle

EVs are often regarded as having zero tailpipe emissions, but wider impacts need to be considered (e.g. grid electricity emissions).

Policy considerations: Greening the upstream

E-mobility is not just about vehicles, it is a system.

EV benefits could be more fully realized when energy supply itself (where power is generated from) mainly comprises renewables.

Electrification – what modes?

- Electrification will be crucial not only in passenger LDVs but also in...
 - Public transport (e.g. 100% electric bus fleets in Shenzhen, China)
 - Municipal cars
 - Two- and three-wheelers / tuk-tuks
 - Freight delivery vehicles in urban areas
- Fleet procurement: Partnerships between public authorities willing to mobilise deployment of clean vehicle fleets to minimise costs of public procurement, e.g.
 - 4 cities in USA (Los Angeles, Seattle, San Francisco, Portland) started a partnership to mass-purchase EVs for their public vehicle fleets.
- The vehicles include not only regular passenger cars but also public bus fleets, police cruisers, street sweepers and trash haulers.

Summary

- Implementing fuel economy can substantially reduce CO₂ emissions – supporting the Paris Agreement and also reduces energy demand and fossil fuel consumption, improve energy security, reduce national expenditures on fossil fuels, and reduce vulnerability to oil shocks.
- Important to understand the problem – establish baseline data / information to plan better and to monitor impacts like emission reduction, and to demonstrate a strong business case and determine appropriate interventions (e.g. technologies) for climate financing
- Need for institutional framework to support integrated policies on transport
- Have mechanisms to review policies, collect data, and impacts on the fleet to be able to adjust policies
- Importance of multi-stakeholder collaboration.

Thank you!

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TOYOTA

261 Clean Air Asia Partnership Members

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Philippines · Sri Lanka · Vietnam**