



Better Air Quality Conference: Breakout session on “Enabling and Scaling-Up Electromobility”

Thursday, 1 September, 2016

Busan, South Korea

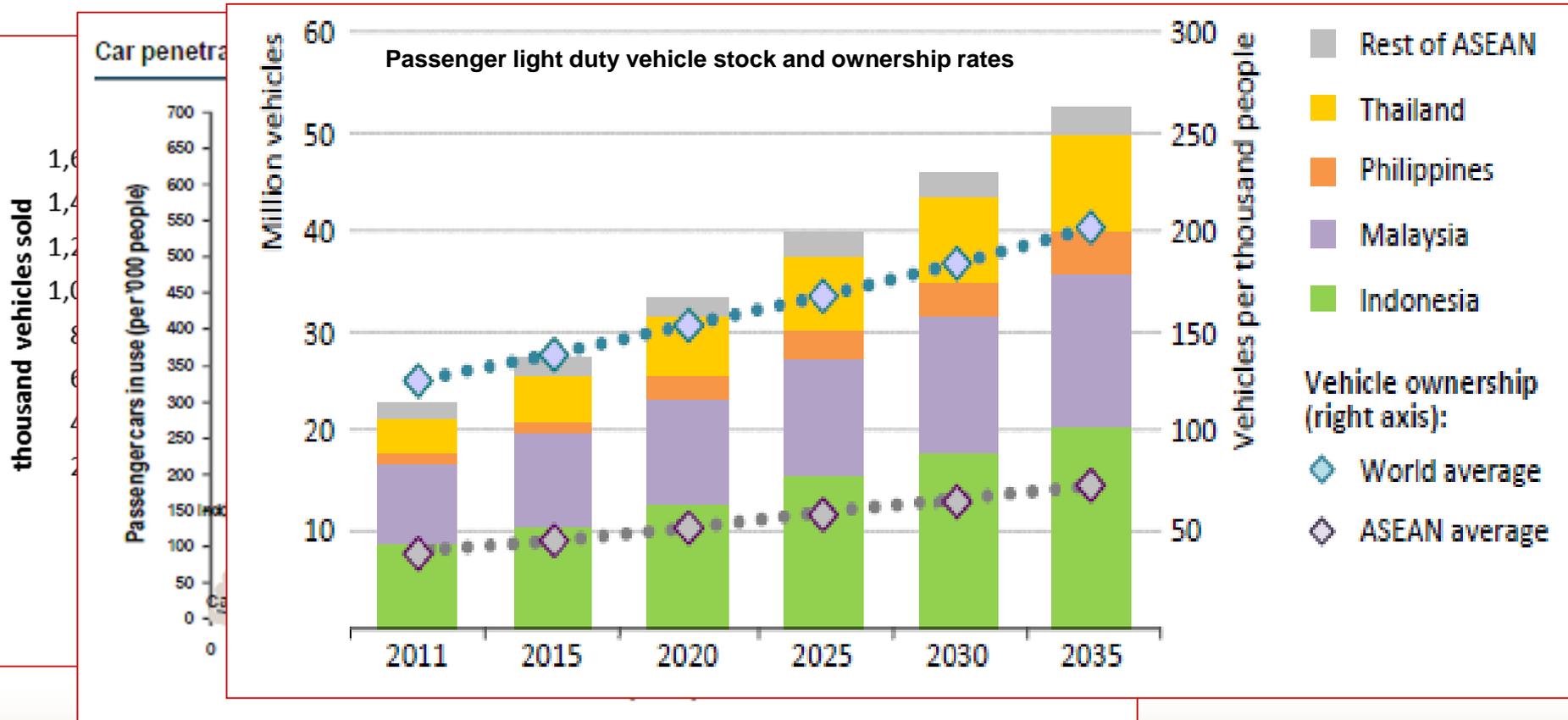
The Neglected Transport Mode: Energy Efficient 2-wheelers in ASEAN

Tali Trigg, Project Director
GIZ

ASEAN-German Technical Cooperation Project
“Energy Efficiency and Climate Change Mitigation in the Land Transport
Sector”



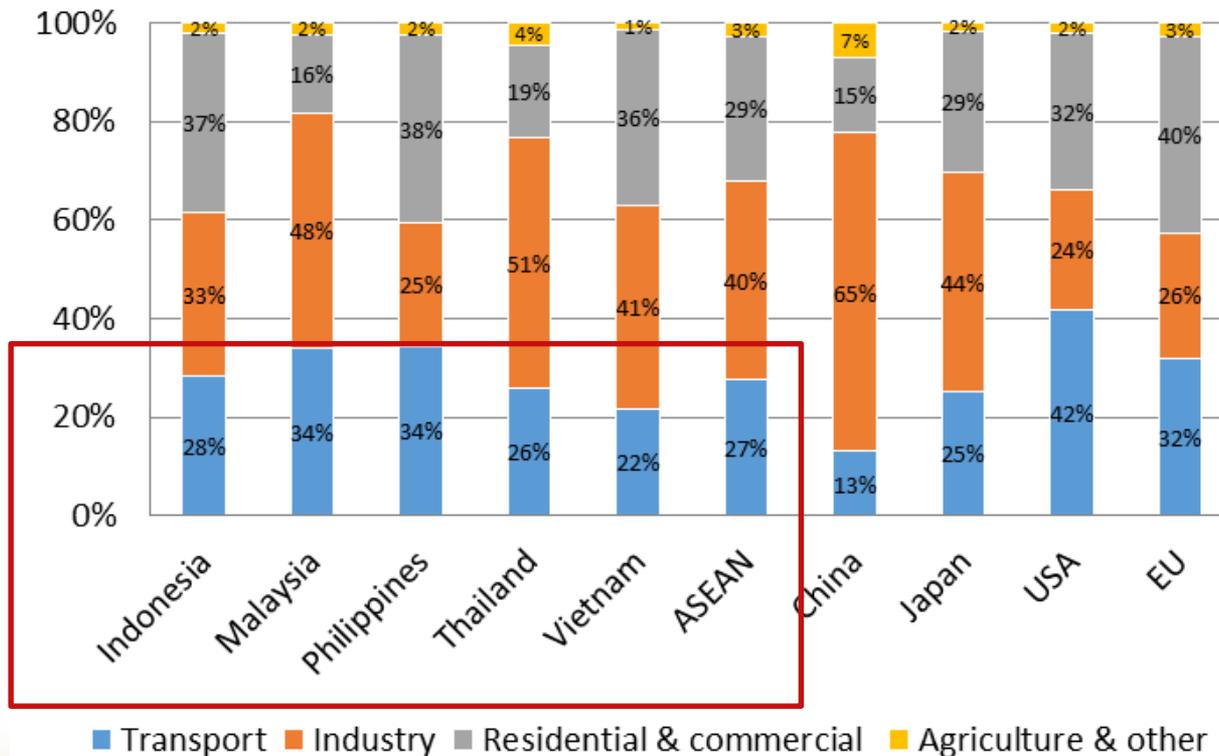
Motorisation is increasing rapidly





Transport is at least 1/4 of energy consumption in ASEAN countries and other parts of the world

Energy consumption by sector (2012)



- Transport is no 1 oil consumer
- Road transport accounts for 80% of consumption
- Freight transport 40% of consumption



New Paradigm: Avoid – Shift - Improve

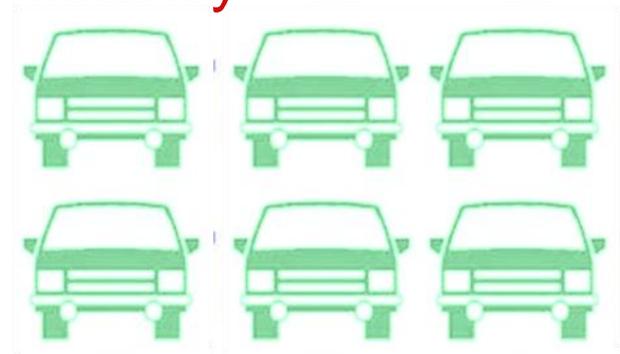
Holistic approach to transport energy efficiency

AVOID
unnecessary trips

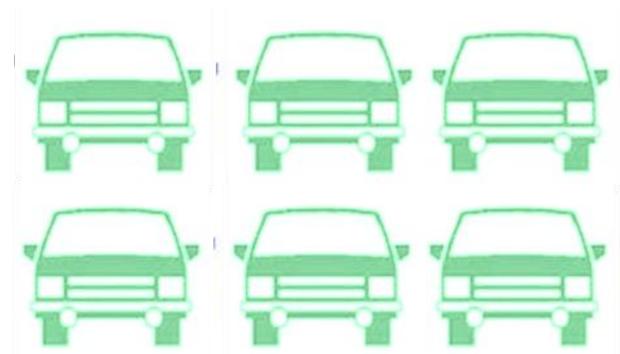
REDUCE km



SHIFT modes



IMPROVE vehicles
low carbon fuels





A shift to e-mobility

- Currently, 90% of worldwide transport primary energy consumption comes from oil (IEA, 2014).
- Electric vehicles (EVs) do not produce any tailpipe emissions.
- **EVs are more energy-efficient than ICEs.**
- Long-term decarbonisation of the transport sector requires a shift to zero emissions vehicles:
 - 75% of all vehicle sales by 2050 need to be (plug-in) electric to achieve the decarbonisation target of 2°C global warming (IEA, 2013).
 - Paris Declaration on Electro-Mobility: Deployment of +400 million electric two- and three-wheelers (E2/3Ws) by 2030 (UNFCCC, 2015).
- **In ASEAN, e-mobility is “almost non-existent” (IEA, 2014).**



Two-wheelers in ASEAN

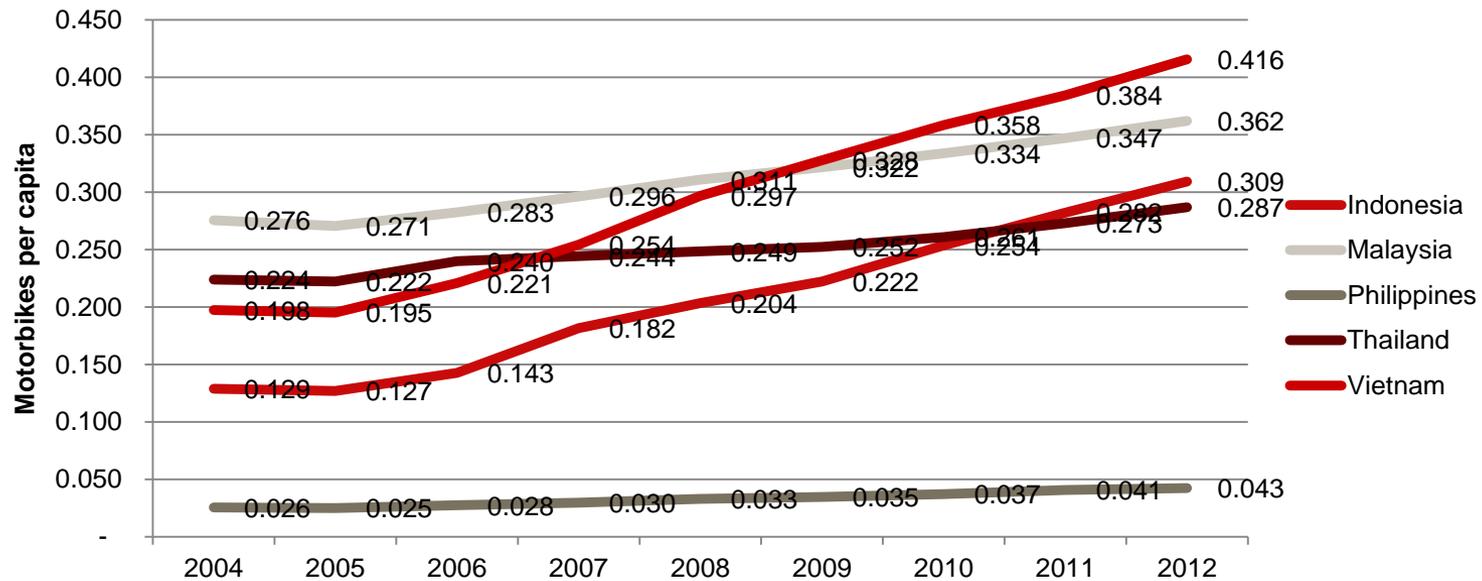
- Nowhere else in the world is the concentration of 2/3Ws as high as in South and Southeast Asia → *Motorcycle cities*
- 2Ws are widespread because they provide:
 - Cheap, reliable, and convenient accessibility
- 2Ws generally take up <40% of the size of a car
 - This allows for a high degree of manoeuvrability, especially in urban congested areas
- They often fill the gaps in urban transport systems
- 2Ws are also used for commercial/freight transport





Two-wheelers in ASEAN

Annual Growth of Motorbikes per Capita (2004-2012)



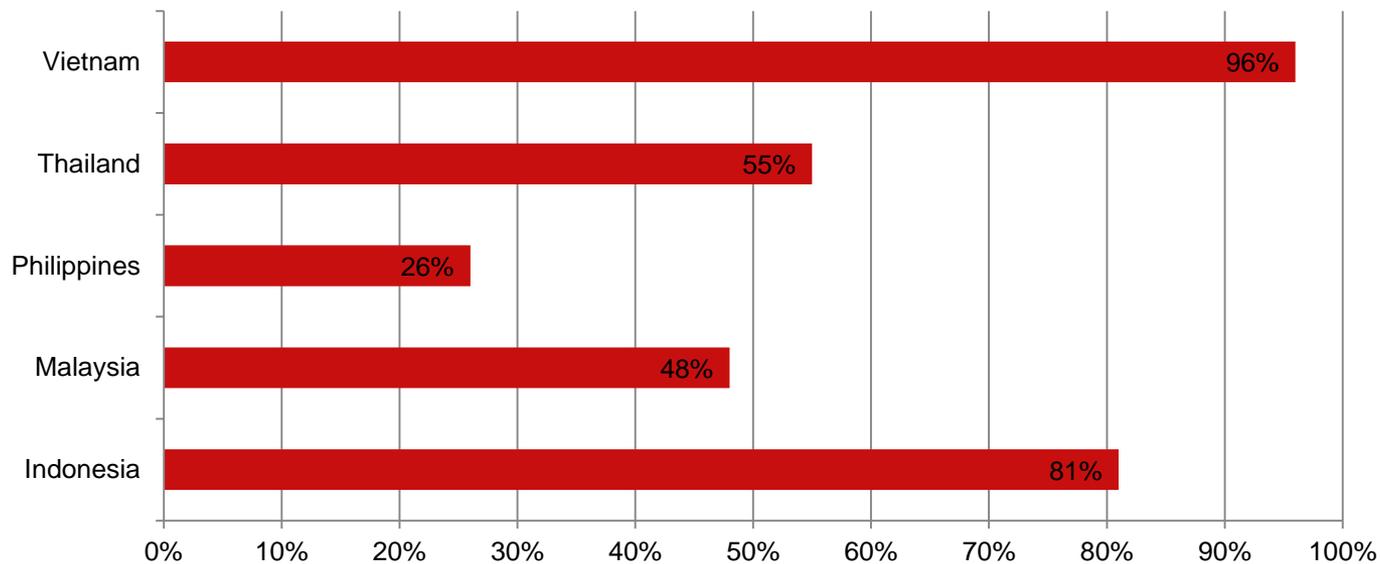
- What are they competing with?



A shift to energy-efficient (electric) two-wheelers

- For the case of ASEAN countries, **shifting from conventional two-wheelers to E2Ws is an easy entry point to e-mobility.**

Share of motorised two- and three-wheelers (2010)





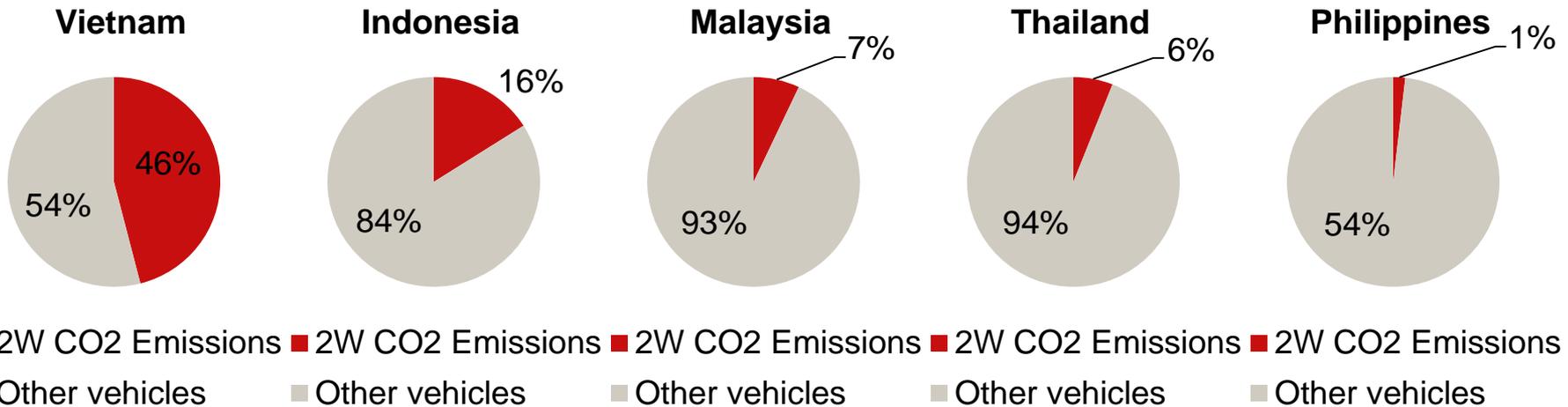
Why shift to energy-efficient (electric) 2Ws? To reduce harmful exhaust fumes

- 85% of global 2Ws have 2-stroke engines (UNEP/KJAER, 2013).
 - With 2-strokes, up to 40% of the fuel and much of the oil escapes unburned (ICCT, 2009).
 - Thus, 2Ws can constitute “the prime source of urban air pollution” (UNEP/KJAER, 2013).

Pollutants	Unit of measurement	2-stroke engine C2W	4-stroke engine C2W
Carbon Monoxide (CO)	[g/km]	27.5	16
Volatile Organic Compounds (VOCs)	[g/km]	14.4	5
Nitrogen Oxides (Nox)	[g/km]	0.16	0.99
Sulphur Oxides (SOx)	[g/km]	0.01	0.02
Particulate Matter (PM)	[g/km]	0.35	0.21



Why shift to energy-efficient (electric) 2Ws? To increase energy efficiency & reduce CO₂ Emissions



- According to the IEA (2014), 100% of countries would get a net CO₂ benefit today due to the efficiency differential between conventional two-stroke C2W and electric two-wheelers (92% efficiency boost).
- Of course, with increasing efficiency of conventional 2-wheelers, this is less the case, but it is also good news.



Unlocking the Potential of E2Ws in ASEAN

- Large potential in all countries, but little policy support
- Electro-mobility focus is on taxis and buses, despite the prevalence of 2-wheelers
- Seen as an interim vehicle mode and blamed for transport safety issues
- E2Ws emit between 1/3 and 4/5 less CO₂ per km compared to petrol-powered 2W
- Scattered few in Vietnam and Malaysia, otherwise China and Netherlands
- Consumers regard high purchase prices, low range of E2W, and long charging times compared to conventional 2Ws as disadvantages
- Public demonstration projects could promote the advantages of E2Ws



Energy efficiency and climate change mitigation in the land transport sector in the ASEAN region

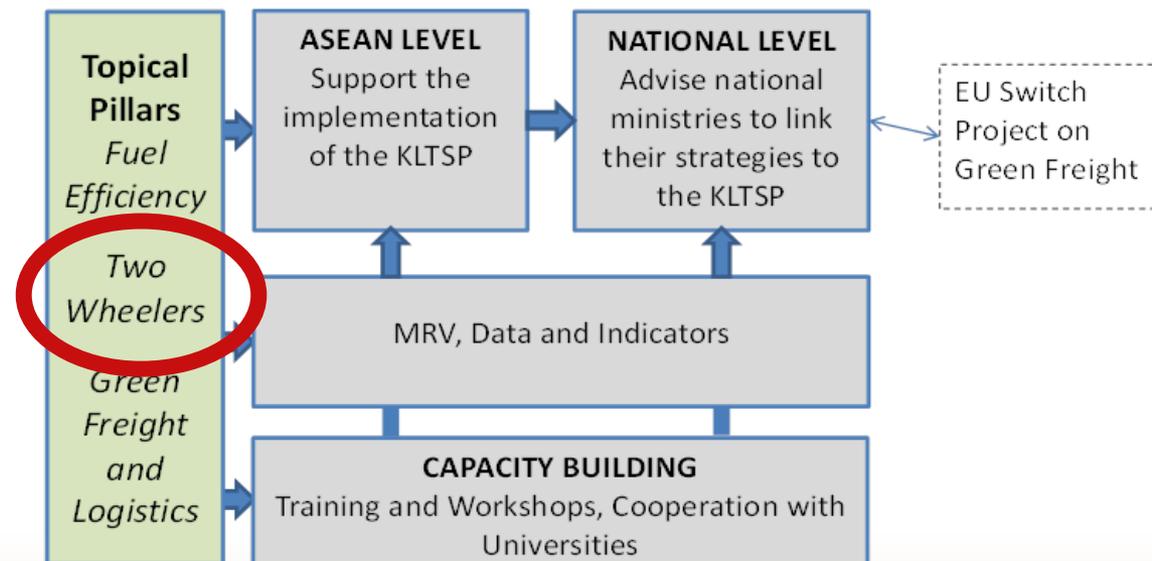
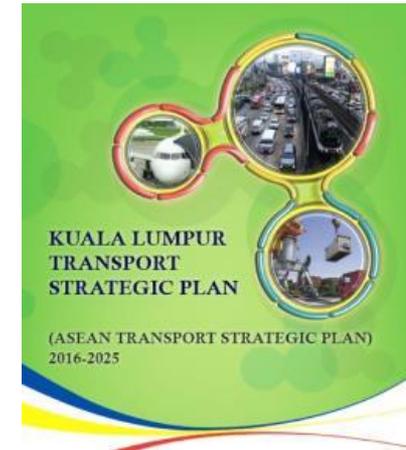
In Short: Transport and Climate Change (TCC)

- **Objective:** The region has strategies and action plans with which it can enhance energy efficiency in the transport sector and reduce the emission of greenhouse gases (GHG).
- **Overall term:** 2012 – 2015 (phase I); 2016 – 2018 (phase II)
- **Budget:** € 2.5 million for phase I; € 3.5 million for phase II
- **Commissioned by:** German Federal Ministry for Economic Cooperation and Development (BMZ)
- **Partner countries:** Indonesia, Malaysia, Thailand, the Philippines, Vietnam



TCC and KLTSP

- ASEAN's Regional Transport Strategy (2016-2025)
- Successor of the Brunei Action Plan
- Has a chapter on sustainable transport including objectives and milestones for
 - fuel economy,
 - green freight, and
 - sustainable transport indicators
- Key reference for TCC II
- Support alignment of national policies with regional guidance





TCC's work on two-wheelers

The world's most overlooked transport mitigation option?

Motivation and Approach

- Despite their high mitigation potential, 2Ws receive **the least attention by policy makers as a mitigation option** (esp. in INDCs)
- TCC promotes an intergrated approach:
 - fuel economy standards and technical improvements,
 - policies and regulations,
 - I&M-programmes,
 - supporting the uptake of E2Ws through standards, awareness raising, myth-busting, experience-sharing

Activities

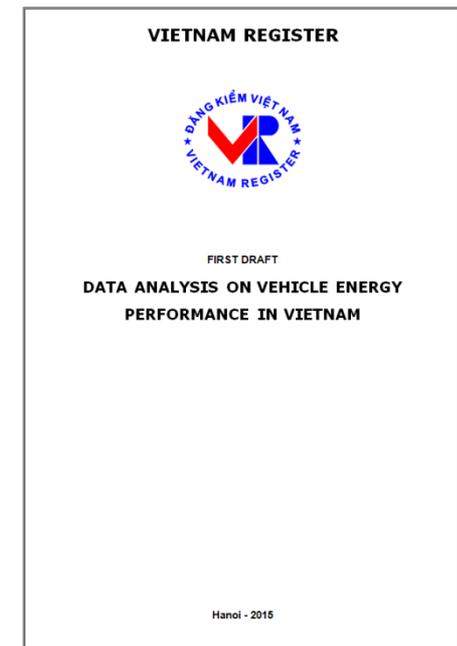
- Factsheet on the potential of electric-two wheelers in Thailand
- Supported a NAMA proposal on Energy Efficient Two-wheelers in Malaysia
- FE Reports – covering two-wheelers (on-going) in Thailand and Vietnam
- Regional workshops and side-events, such as here at the BAQ



Vietnam: Can two-wheelers get more efficient?

Table 1 – Number of motorcycles locally manufactured and assembled and imported

Year	2005	2010	2011	2012	2013	2014
Quantity						
Manufactured and assembled (units)	2,187,870	3,141,698	3,671,441	3.282.220	3.268.228	2.916.689
Imported (units)	45,716	92,516	66,839	36.528	19.037	20.713



Source: Vietnam Register

- Less than 1% of all newly registered two wheelers are imported
- Based on data from 5 biggest manufacturers, the state of the art of two-wheeler fuel economy can be determined → **2.6 L/100km** (preliminary result)

Source: (draft) Data Analysis in Vehicle Energy Performance in Vietnam



Outlook

- E2Ws, especially e-bikes, have a high potential for enhancing energy efficiency and security, and for reducing local air and noise pollution
- The uptake of e-bikes in China represents the largest adoption of an alternative fuel vehicle in history
 - how can we leverage such **a transformation in ASEAN?**
- ASEAN has the opportunity to shape and define 2W-regulations on a global level.
- **Promoting the energy efficiency of conventional motorcycles (including electrification) is imperative to achieving the goals set forth by the ASEAN KLTSP (2016-2025) and the 2015 Paris Agreement.**



So why have e2Ws been neglected so far?



Thank you for your attention!

For information/ inquiries, please contact:
Tali Trigg (tali.trigg@giz.de)



www.TransportAndClimateChange.org

www.CitiesEnvironmentTransport.org

www.facebook.com/TransportClimateASEAN



Energy Efficiency and Climate Change Mitigation in the Land Transport Sector in the ASEAN Region

Home The Project News & Events Documents Countries Links Contact Us

Project Overview
In order to move towards sustainable transport in the ASEAN region, this project aims at improving energy efficiency and thereby mitigating greenhouse gas emissions arising from land transport. This requires comprehensive strategic orientation of decision makers at the level of national, regional and local governments.
More

Transport & Climate Change
A certain level of mobility creates benefits for economic and social development, however the current trends in the transport sector in Asia are unsustainable. Having the 2nd largest vehicle fleet in Asia just after China, ASEAN already faces serious problems including congestion, fossil fuel consumption, air pollution and road safety.
More

News & Events
Regional exchange on NA... How can NAMAs help sustainable transport in Asia? This was the cent...
More

Regional Programme
Cities - Environment - Transport

german cooperation DEUTSCHE ZUSAMMENARBEIT
giz



Previous Next Options

Transport and Climate Change in ASEAN

Page Messages Notifications Insights Posts Settings

Transport and Climate Change in ASEAN
Non-Profit Organization
Create Call-to-Action Share

472 likes

Reach a new milestone
500 Likes
Promote Page

ABOUT

In order to move towards sustainable transport in the ASEAN region, our giz project aims at improving energy efficiency and mitigating GHG emissions from...
READ MORE

Status Photo / Video Offer, Event +

What have you been up to?

Transport and Climate Change in ASEAN
25 mins ·

"Metro Manila traffic is congested and chaotic, not because it's unmanageable, but rather because it is unmanaged"
This commentary explains what Manila can learn from Seoul in on reforming the bus system.

Recent
2015
2014
2013

See Your Ad Here

Transport and Climate Ch...
In order to move towards sustainable transport in the ASEAN region, our giz project aims a...
Like Page · 472 people



As a federal enterprise, GIZ supports the German Government in achieving its objectives in the field of international cooperation for sustainable development.

Published by

Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Registered offices, Bonn and Eschborn, Germany

Energy Efficiency and Climate Change Mitigation in the Land Transport
Sector in the ASEAN Region

c/o Office of Transport and Traffic Policy and Planning
35 Rama 6 Road, Thung Phaya Thai, Ratchathewi, Bangkok 10400

T +49 61 96 79-0

F +49 61 96 79-1115

E tali.trigg@giz.de

I www.giz.de

Responsible

Tali Trigg

Author(s)

Tali Trigg

Photo credits

© GIZ/Stefan Bakker

Layout

GIZ

In cooperation with

