german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Good practices of NAMAs and National MRV Systems

MRV in the Transport Sector

UNFCCC NAMA Workshop

24 April 2014, Ventianne

Friedel Sehlleier

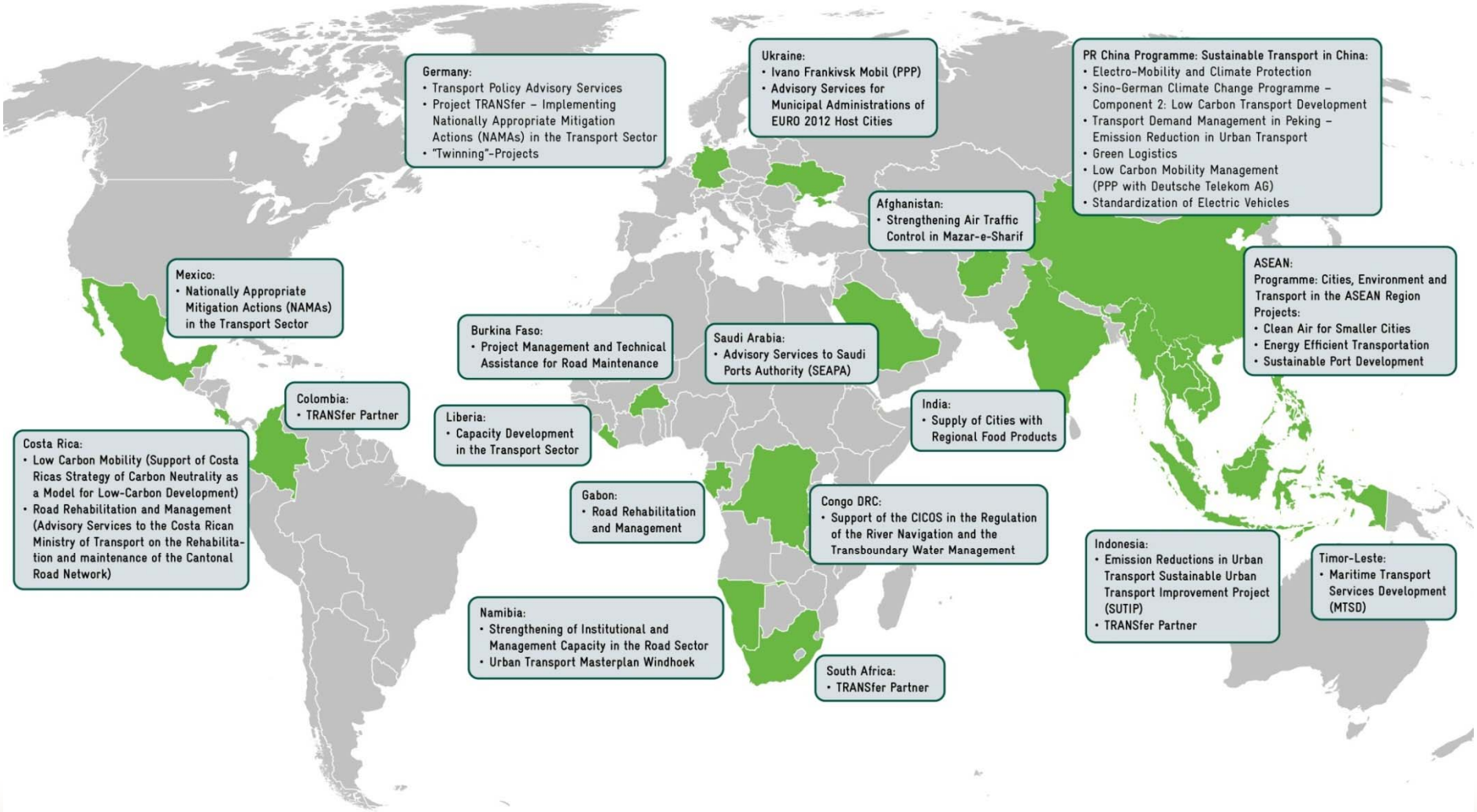
Table of Content

- Setting the scene: Transport and Emissions
- Approaches to reduce emissions / Mitigation Actions
- Emission Quantification Methodologies
- Country Examples: China and Mexico

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

GIZ Projects in the Transport Sector



Transport…

- … provides personal **mobility**, enhances **equity & social inclusion**.
- … facilitates local & international **trade and economic growth**.

- … leads to productivity losses from **congestion**.
- … impacts human health from local **air pollution**.
- … contributes to climate change from **GHG emissions**.

… 24% energy-related CO2 em.

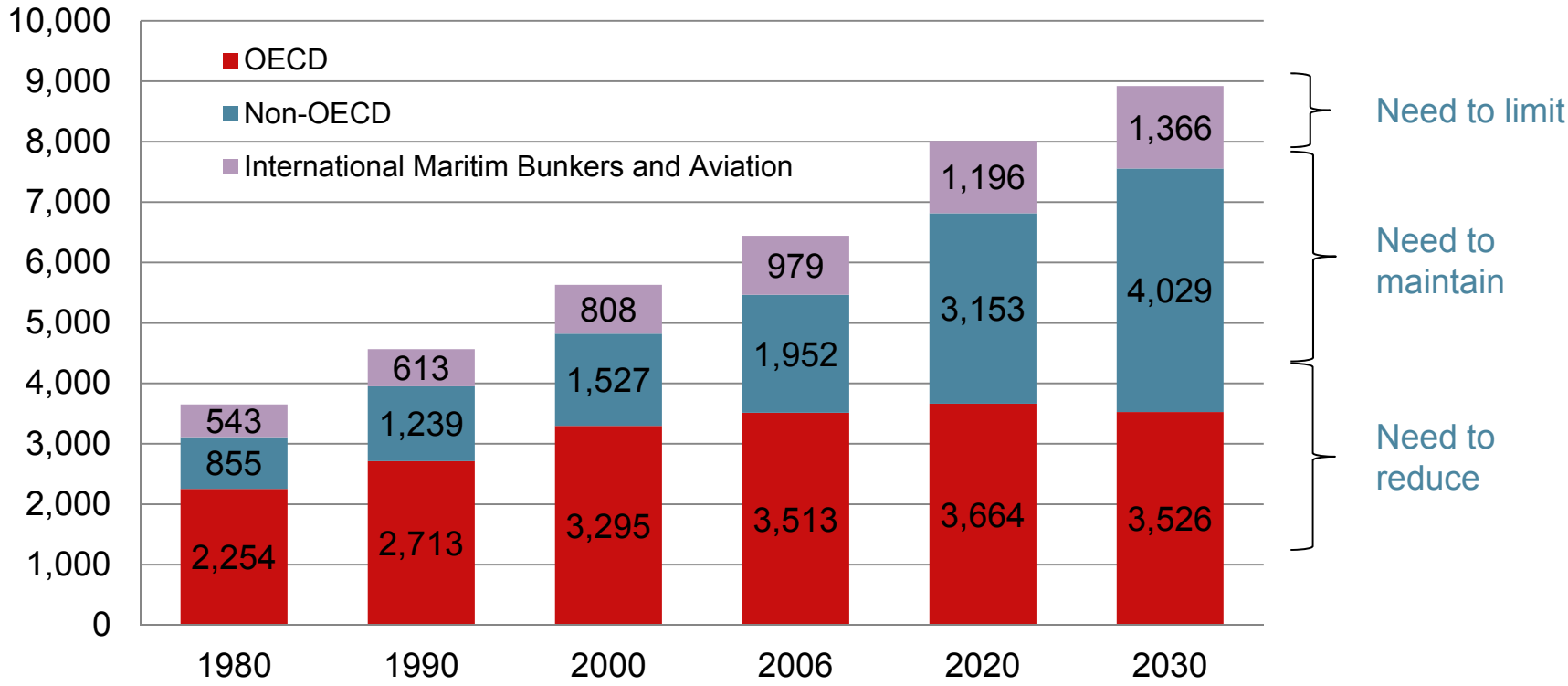
… fastest growing sector

… GHG em. projected to double by 2050 (BAU)

Source: WRI

Transport Sector CO2 Emission by Region

WEO Reference Scenario, 1980-2030, in million tonnes



- 13% of world GHG emissions (IEA 2009)
- The transport sector is the fastest growing sector in terms of CO_2 emissions in developing countries.

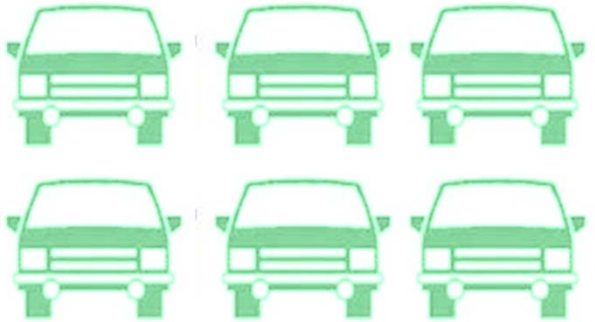
Source: Bongardt et.al. 2009 (based on IEA 2008)

Avoid – Shift - Improve:
Comprehensive Approach to GHG Reduction

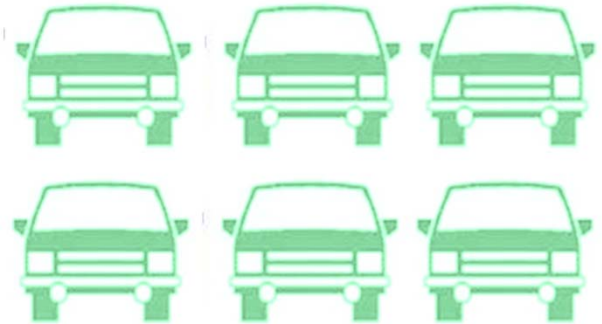
AVOID
unnecessary trips

REDUCE km

SHIFT modes



IMPROVE vehicles
low carbon fuels



german cooperation
DEUTSCHE ZUSAMMENARBEIT

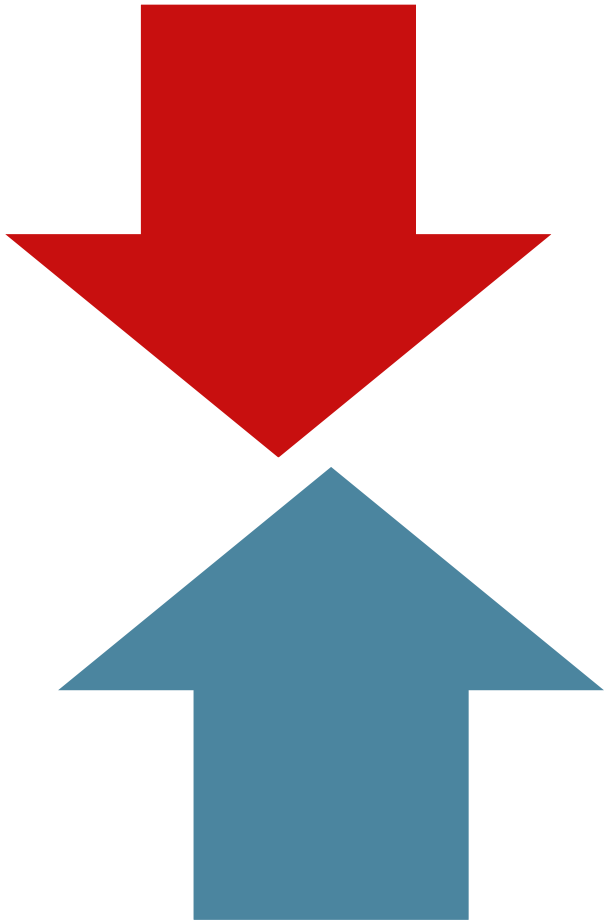
Implemented by

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

How to measure transport emissions

asean

GHG Measurement Approaches



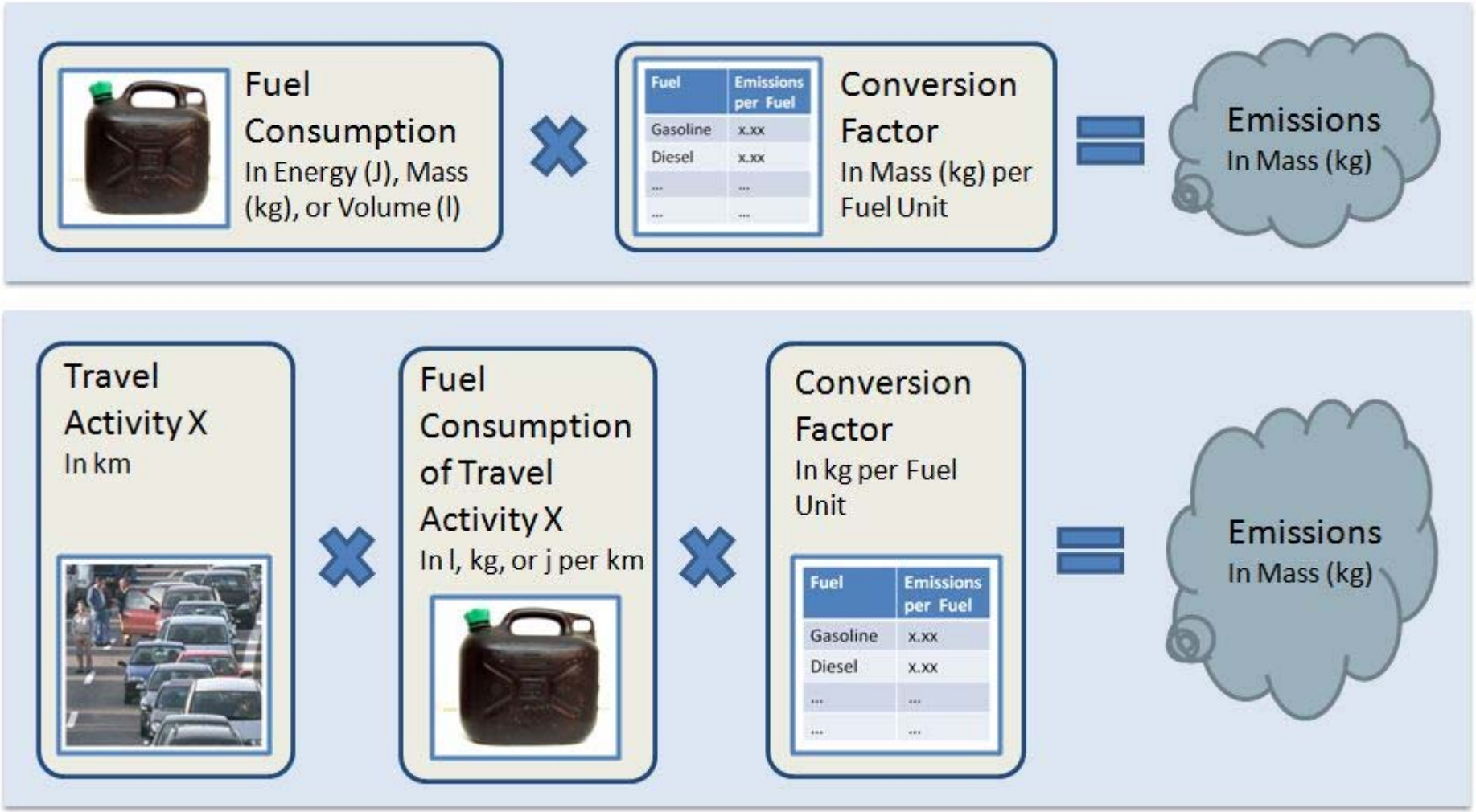
Top Down

National level data

Bottom Up

Data gathered from more detailed sources

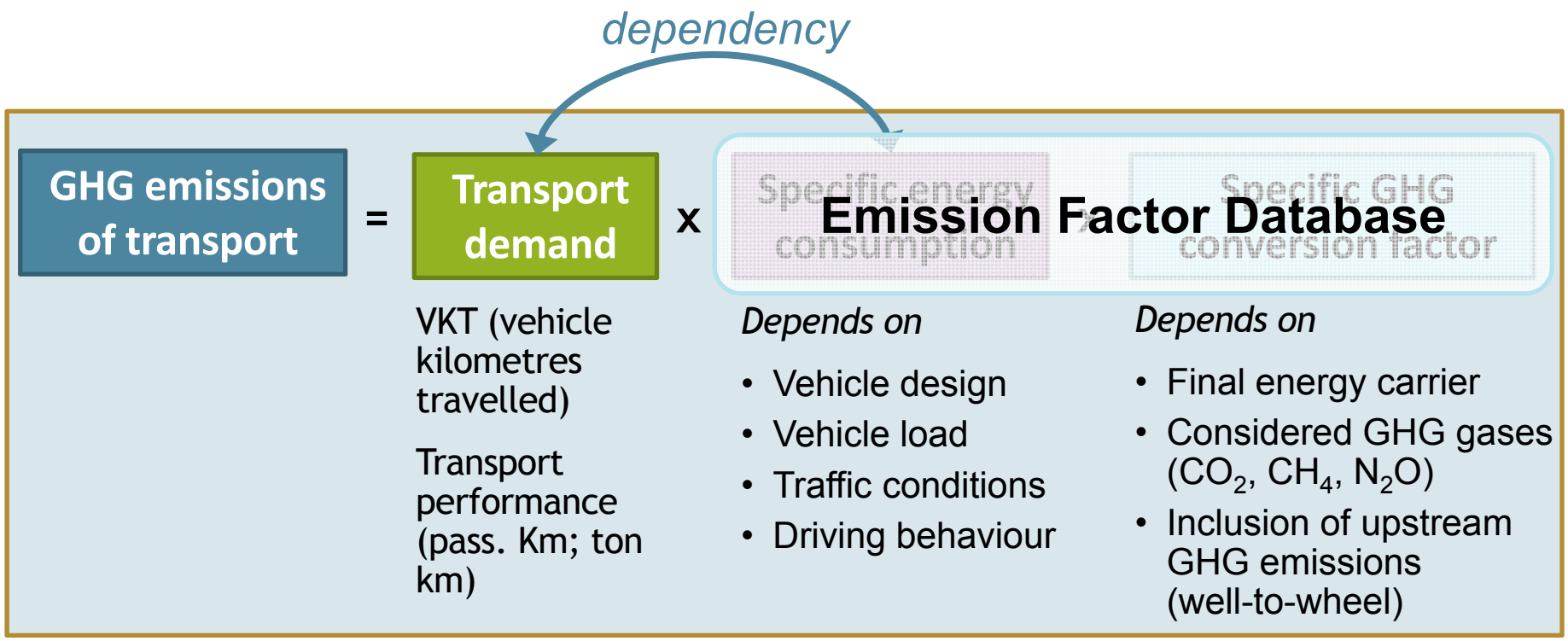
Top down vs bottom up



Comparison of Approaches

Approach	Advantages	Disadvantages
Top Down	▪ National level data is normally available ▪ National level datasets tend to be relatively high quality ▪ Datasets are often consistent ▪ Good for historic emission estimates.	▪ Relatively low level of detail ▪ Lack of data can make use of emission inventories challenging ▪ Not well suited to assessing impact of transport policies.
Bottom Up	▪ Emission sources assessed in detail based on data from individual sources ▪ Allows information on local issues, such as congestion, to be identified	▪ The most accurate estimates require a large number of different datasets. ▪ Requires an extensive amount of data collection and handling ▪ Datasets can be inconsistent or of a relatively low quality

How to calculate GHG emissions (bottom-up?)



german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Transport Demand Management in Beijing – Emission reduction in Urban Transport

Objective:
Effective measures for Transport Demand Management (TDM) will be proposed for implementation and tools for measuring impacts will be applicable

Components:

1. Identification and development of effective TDM measures for reducing CO_2 emissions.
2. Development of a model for transport related CO_2 emission reduction estimations
3. Dissemination of measures and tools to other Chinese cities

Partners

Beijing Municipal Commission for Transportation (BMCT)

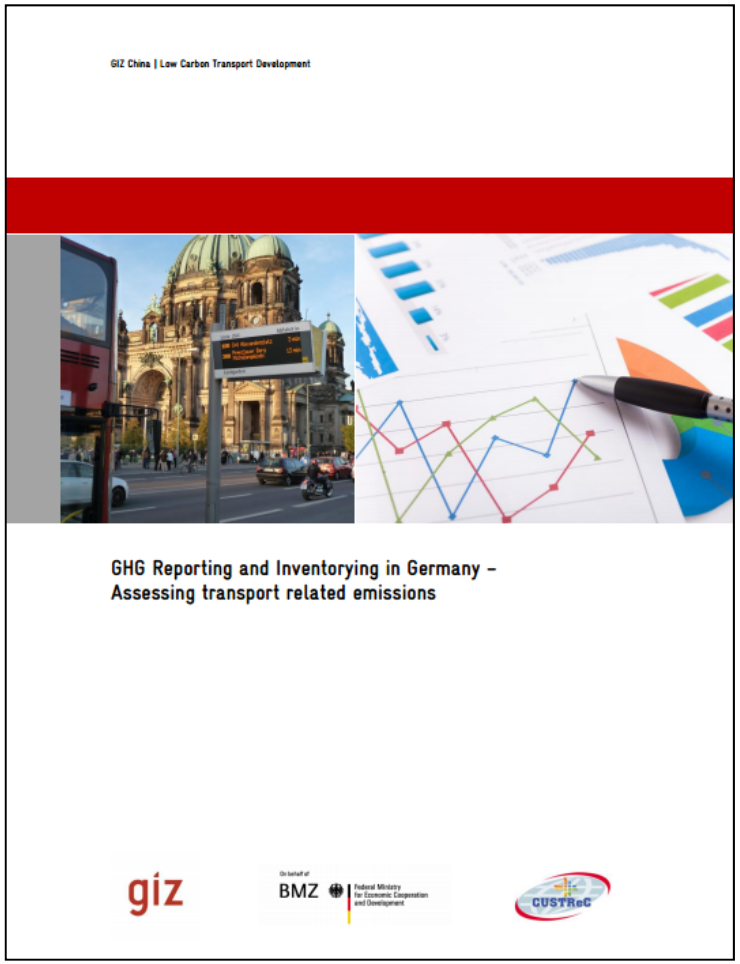
Beijing Transport Research Center (BTRC) – *implementing partner*

National Development and Reform Comission (NDRC)

National GHG Inventories

"GHG Reporting and Inventorying in Germany – Assessing transport related emissions"

- Institutional set-up for GHG inventory planning, preparation and management at the national level in Germany
- General description of the data and methods used for the calculation of transport related emissions
- Tier 3 approach for GHG reporting considering traffic data and bottom up calculation (incl. CH4, N2O and cross-boundary traffic).
- http://sustainabletransport.org/tag/giz-publication/

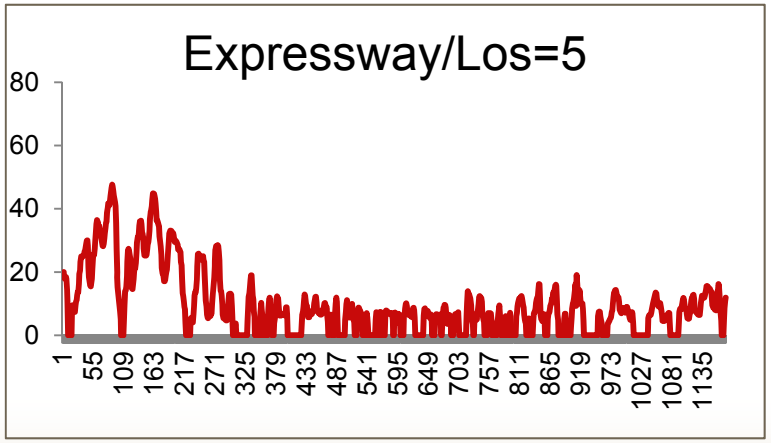


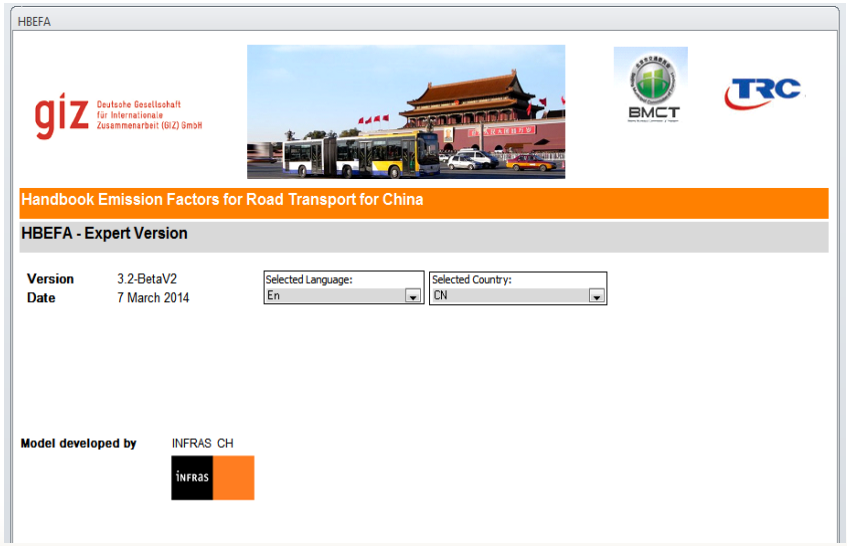
Experience from China

Emission Modeling Package

China Handbook for Emissions Factors (CHEF-Model)

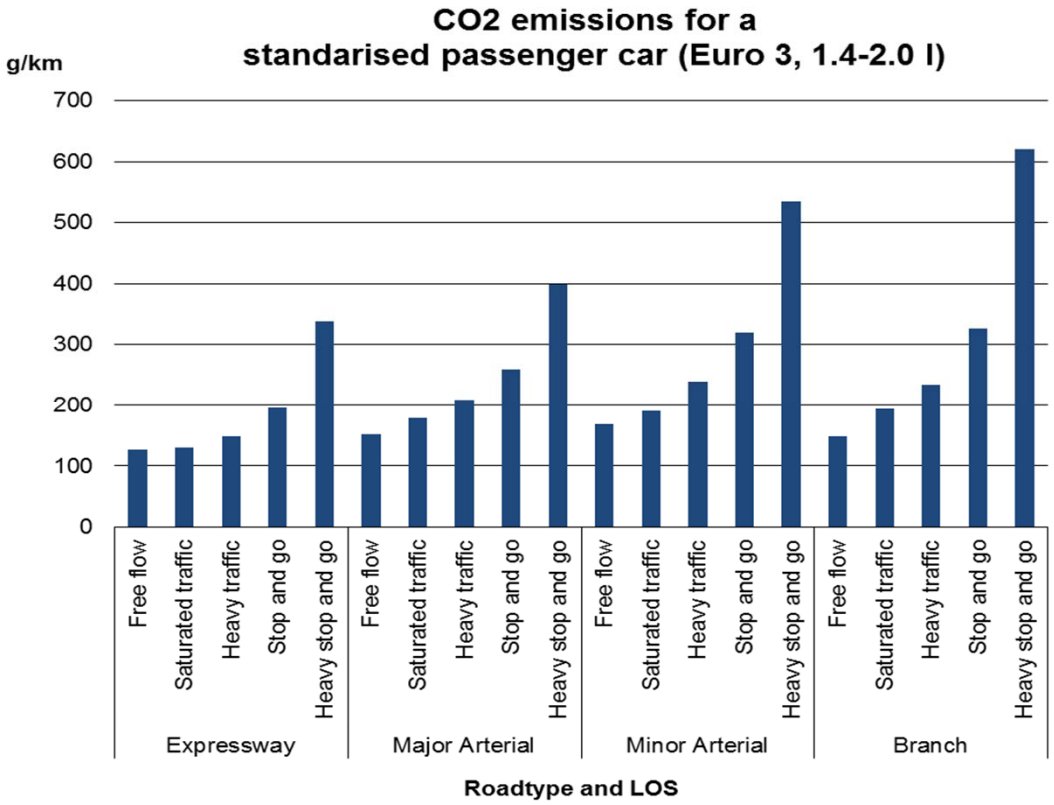
- A software package with adopted emission factors for China (CO2/km)
- Integration of all components of an emission model with a user friendly interface under development
- The objective is to estimate road traffic emissions with high temporal and spatial resolution
- delivered to local partners

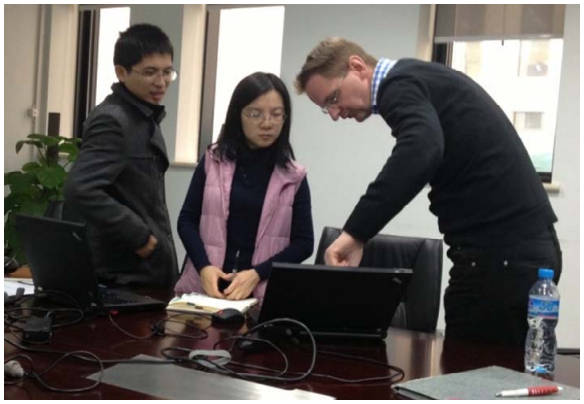


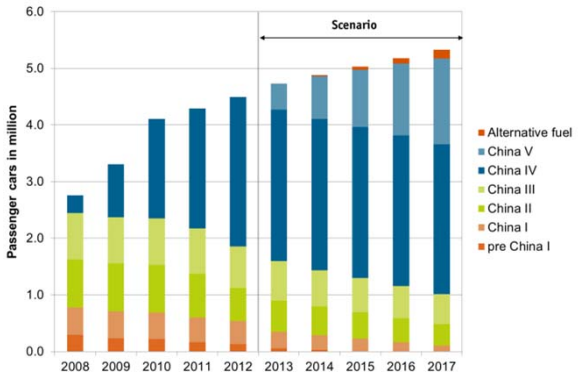


Emission Quantification

Chinese emission factors to support scenario evaluation







China: Congestion in Beijing

Reduced traffic flow and network capacity

Sept 2007

(3.06 million, no restriction on traffic volume;
Congestion index: 7.95)

Sept 2009

(3.87 million, restricting traffic volume;
Congestion index: 5.93)

Sept 2010

(4.51 million, restricting traffic volume;
Congestion index: 7.80)

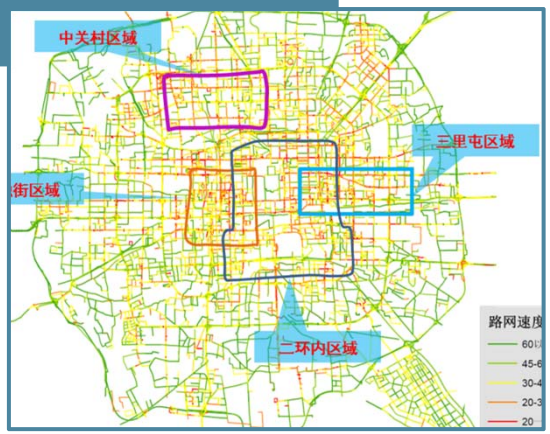
Sept 17, 2010

(Congestion index: 9.70)

Congestion Charging

Scenario analysis for optimal solutions

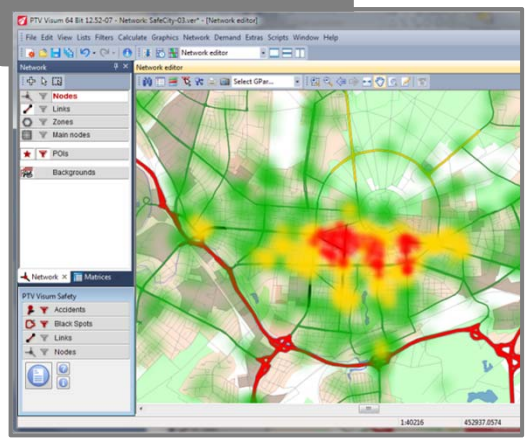
Policy description



Input data & criteria

- Travel time
- Travel distance
- Willingness-to-pay
- etc.

Traffic modelling



Mexico's Road Freight Transport NAMA

Objective: Reduce emissions in Mexico's Road Freight Transport sector with a focus on small and medium-sized enterprises.

Cooperation between the Ministry of Communication and Transport (SCT), the Ministry of Environment and Natural Resources (SEMARNAT) and GIZ.

In order to modernise the fleet and promote efficient usage, various activities are being supported:

1. Scrappage scheme to renew the fleet
2. "Transporte Limpio" to make the existing fleet more efficient

MRV approach for road freight transport NAMA Mexico

- **Mitigation effect = baseline – NAMA scenario**
- Baseline / NAMA scenario = activity x emissions factor

Indicators:

- GHG: (reduced) t CO2
- Transport: number of scrapped vehicles, vehicle age, remaining lifespan, emissions factors, distances traveled (tkm), fuel consumption, …
- Sustainable development benefits: PM, CO, NOx, accidents, jobs, …

- Difficulties for road freight
  - Multitude of small non-homogeneous sources
  - Direct and indirect impacts
  - Many factors to be taken into account: condition of streets, driver behaviour, …

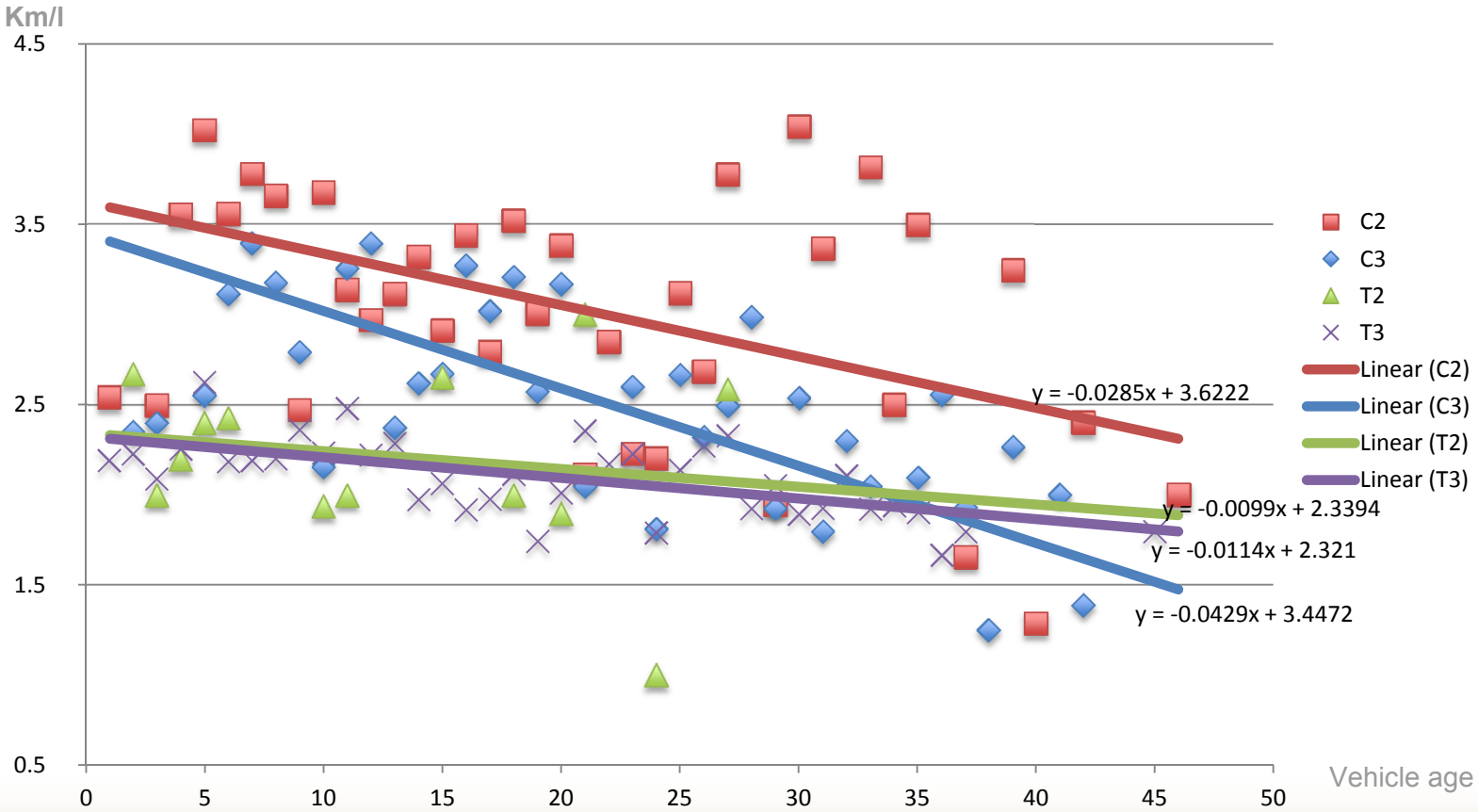
Simple MRV Approach

- Grouping of the fleet (vehicle type): C2, C3, T2, T3
- GHG reductions during remaining lifespan (of old vehicle)
  - Direct: $tkm_{old\_per\ year} \times (EF_{old} - EF_{new})$
  - Indirect: $(tkm_{new\_per\ year} - tkm_{old\_per\ year}) \times (EF_{fleet} - EF_{new})$
- GHG reductions after remaining lifespan (of old vehicle)
  - $tkm_{new\_per\ year} \times (EF_{new\ without\ NAMA} - EF_{new})$
- Data requirements:
  - $tkm_{annually}$ for each group
  - Emissions Factor (EF) for each group
  - Age and remaining lifespan of scrapped vehicles

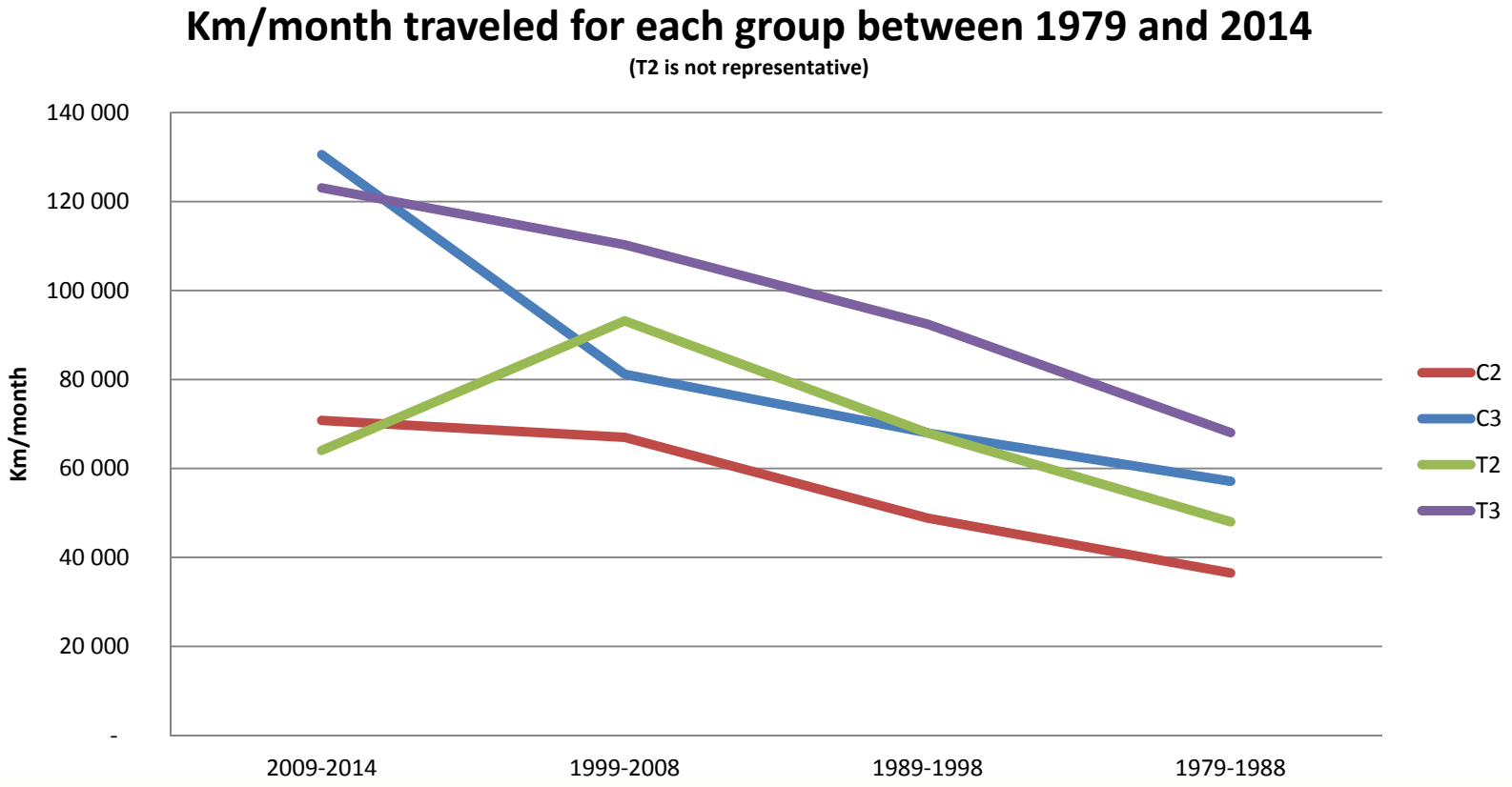
Key issue: The fleet age among different sectors

Fleet age	Freight	Passenger	Tourism	Total
1 - 10 years	122,984	23,600	15,306	161,890
11 - 20 years	90,629	16,491	13,977	121,097
21 - 30 years	63,023	5,016	5,708	73,747
31 - 40 years	62,144	2,065	3,735	67,944
41 or more	12,925	-	367	13,292
Total	**351,705**	**47,172**	**39,093**	**437,970**
Fleet aged above 20 years	138,092	7,081	9,810	154,983
Share of total	39.3	15.1	25.1	35.4

Data survey: efficiency



Data survey: km traveled



Mexico's Road Freight Transport NAMA: Lessons learnt

I

- There is a „perfect vehicle scrap age"
- Among the different types of trucks the most significant mitigation potential lies in scrapping C3

➢ MRV as means to improve the programme

II

- Fleet renovation is more effective than solely scrapping
- Environmental impact of scrapping alone is relatively small

➢ Do not only focus on the scrapping alone but complement it with further measures (quality standards, driver trainings, …)

➢ Scrapping alone is not enough to tackle the emissions in the transport sector

III

- Data need to be collected and updated, but expenses in general for MRV approach are reasonable.

➢ MRV can be built and improved step-by-step

MRV Roadmap process




Aim of this undertaking:

- lower the barriers to establish MRV
- contribute to a common understanding of elements of MRV
- facilitate developing and implementing transport NAMAs

- ➢ Establishment of an interdisciplinary expert group
- ➢ Reference document on "*How to develop a roadmap for MRV systems in the transport sector?*"
- ➢ Set of peer-reviewed *MRV Blueprints for Transport NAMAs*
- ➢ *Country Case Studies*

MRV Expert Workshop

- 2nd Workshop in Leipzig (Germany) on 20th May 2014
- Organisations involved:
  - UNECE
  - CCAP
  - IEA
  - ADB
  - IDB

MRV of Transport NAMAs: Challenges

- No clear definitions of MRV
- No standardized process
- Expectations of donors are partly unclear
- Availability and accessibility of data
- Fear of complexity

MRV of Transport NAMAs: Key messages

- MRV of Transport NAMAs is feasible (even for complex NAMAs)
- No need to replicate the CDM
- Start with the existing data, improve MRV system over time
- Understand MRV as means to improve policies and measures: MRV leads to improved transport policy

Thank you for your attention !

Friedel Sehlleier

friedel.sehlleier@giz.de

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

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

Responsible
Stefan Bakker

ASEAN – German Technical Cooperation

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

E stefan.bakker@giz.de
I transportandclimatechange.org

In cooperation with

asean