

# Developing a Green Freight Strategy – First Steps

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Manila**

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# Achieving Green Freight in Asia?

## 1. Visioning Green Freight

- Develop Vision with Stakeholders

**Framework**

**Target**

## 2.

## Assess Current Scenario

**Measurement**

**Data & KPI**

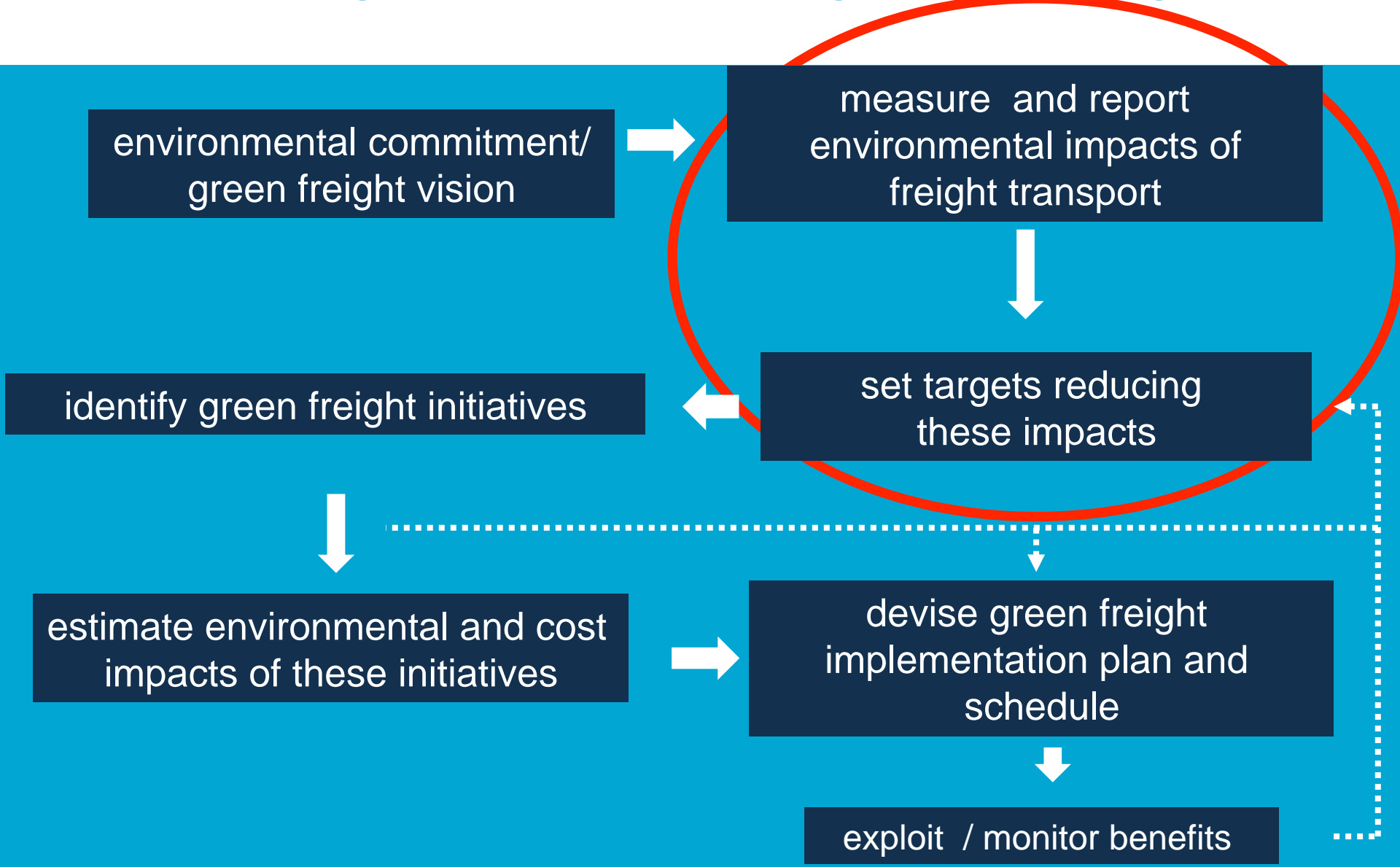
## 3. Identify & Implement Green Freight Measures

- Identify suitable measures
  - Priority Projects
  - Implementation
    - Monitoring
    - Evaluation

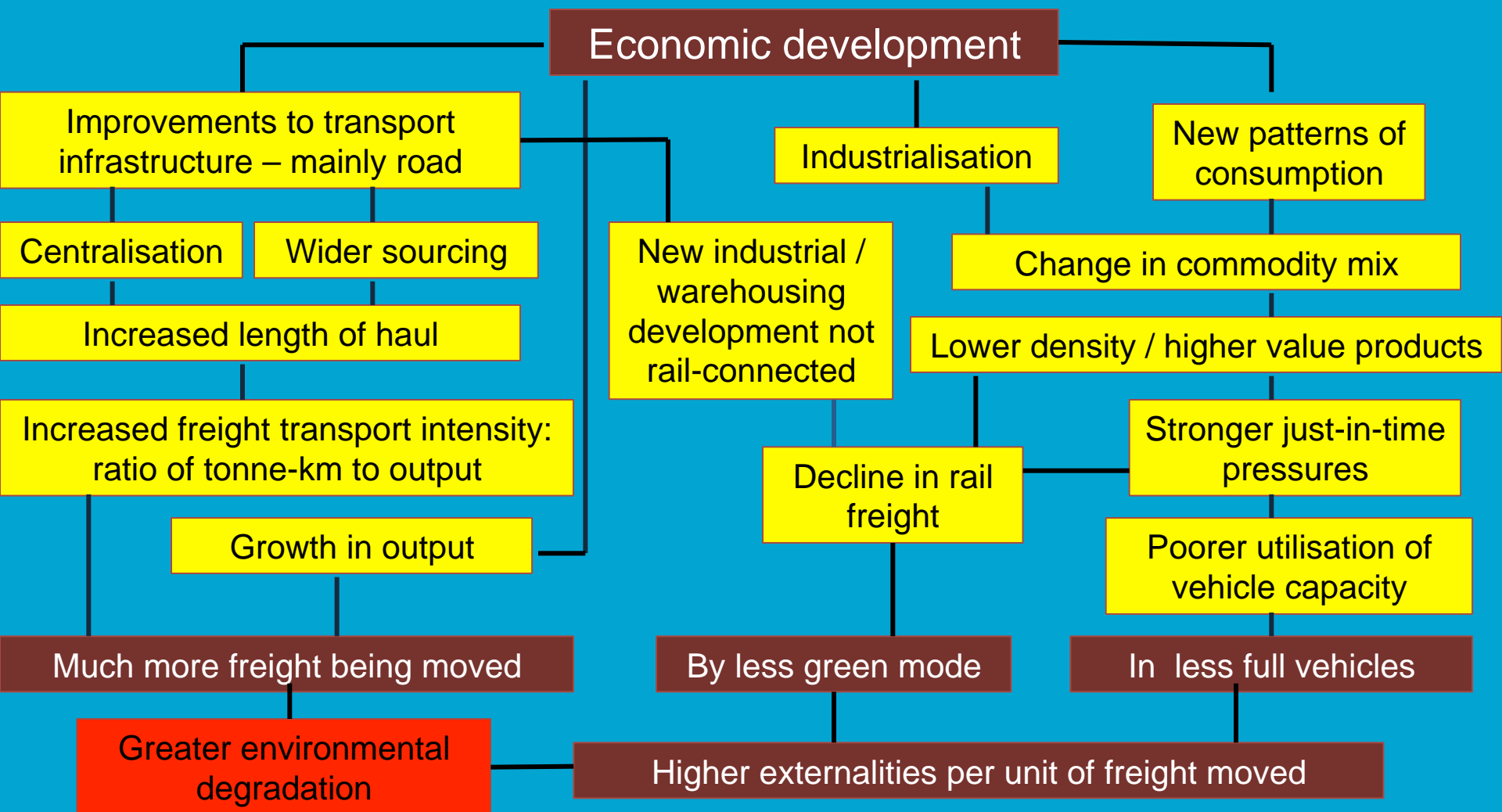
## 4. Green Freight Program

- Define clear objectives, scope & plan of action
  - Financial mechanisms
- Recognition Program

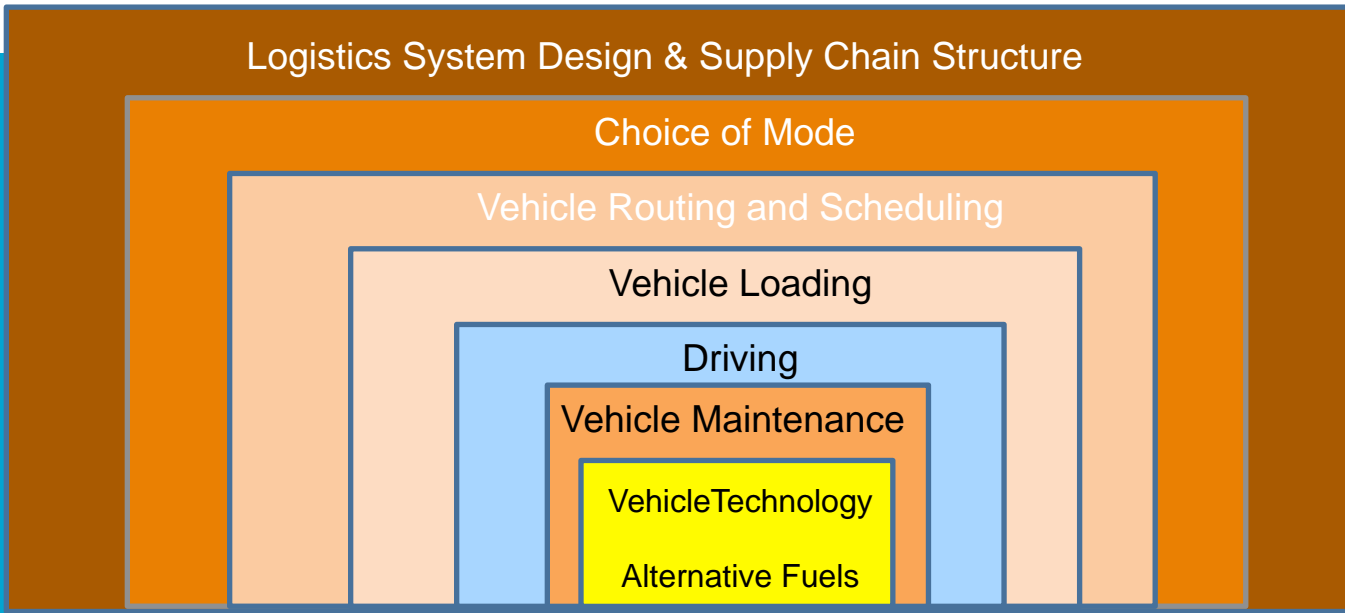
# Developing a Green Freight Strategy



# Economic Development & Freight



# Levels of Environmental Intervention

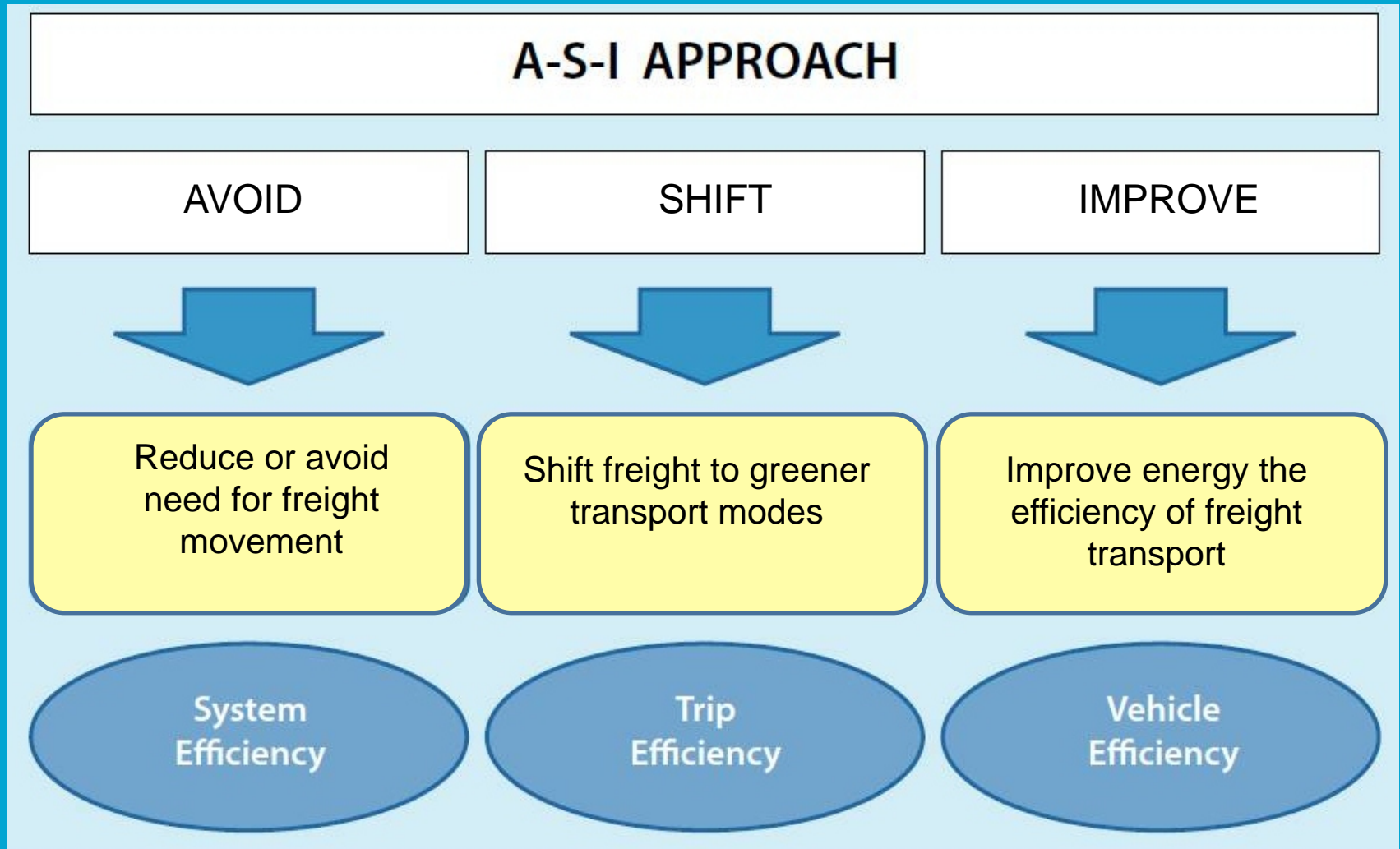


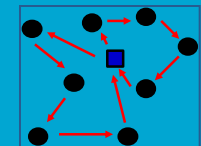
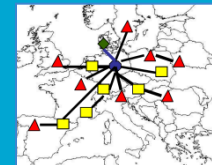
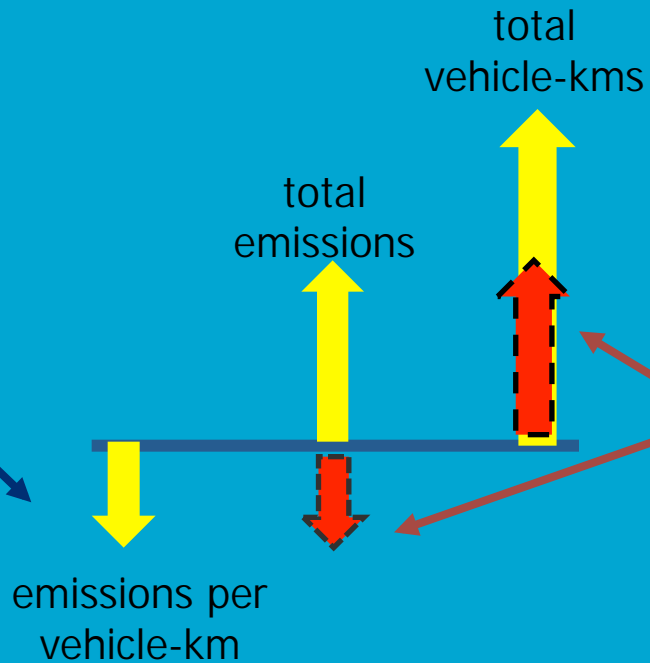
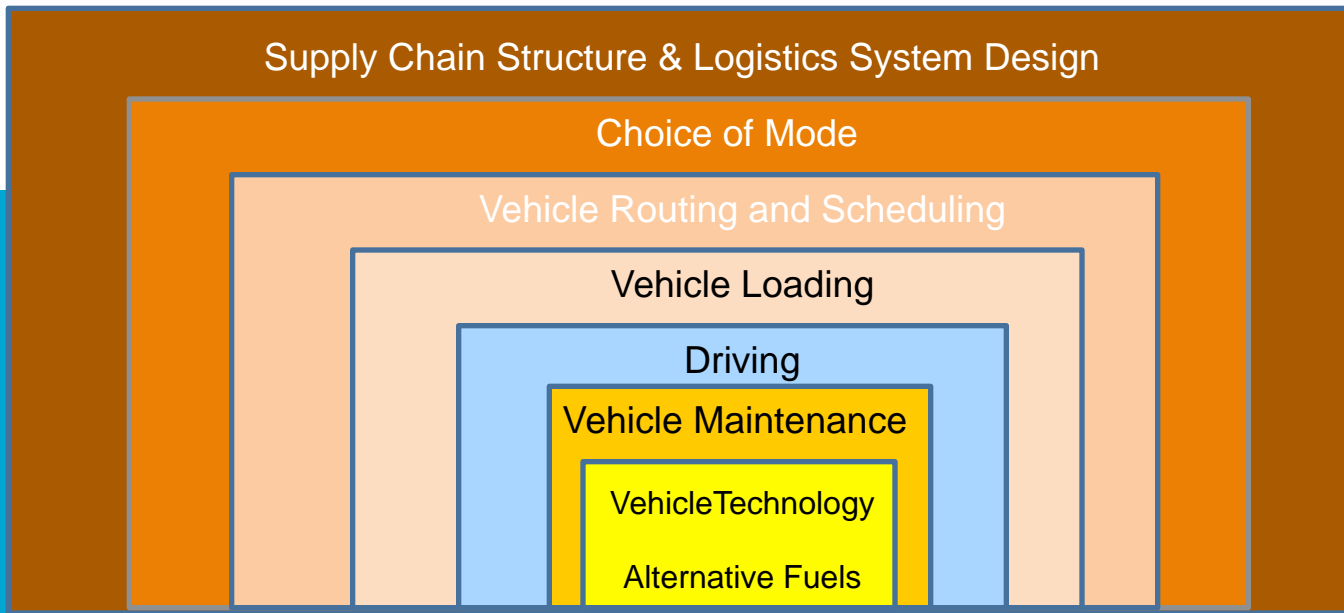
vehicle + equipment  
manufacturers  
energy suppliers



# FRAMEWORKS

# Sustainable Freight Transport Framework – Avoid-Shift-Improve







# Sustainable Freight Transport Framework – Activity-Structure-Intensity-Fuel (ASIF)

## Emissions from Transport

$$G = A * S_i * I_i * F_{i,j}$$

Total Transport Activity

Veh-km and pass-km by mode

Emissions per unit of energy or volume or km

Occupancy/ Load Factor

Modal Energy Intensity

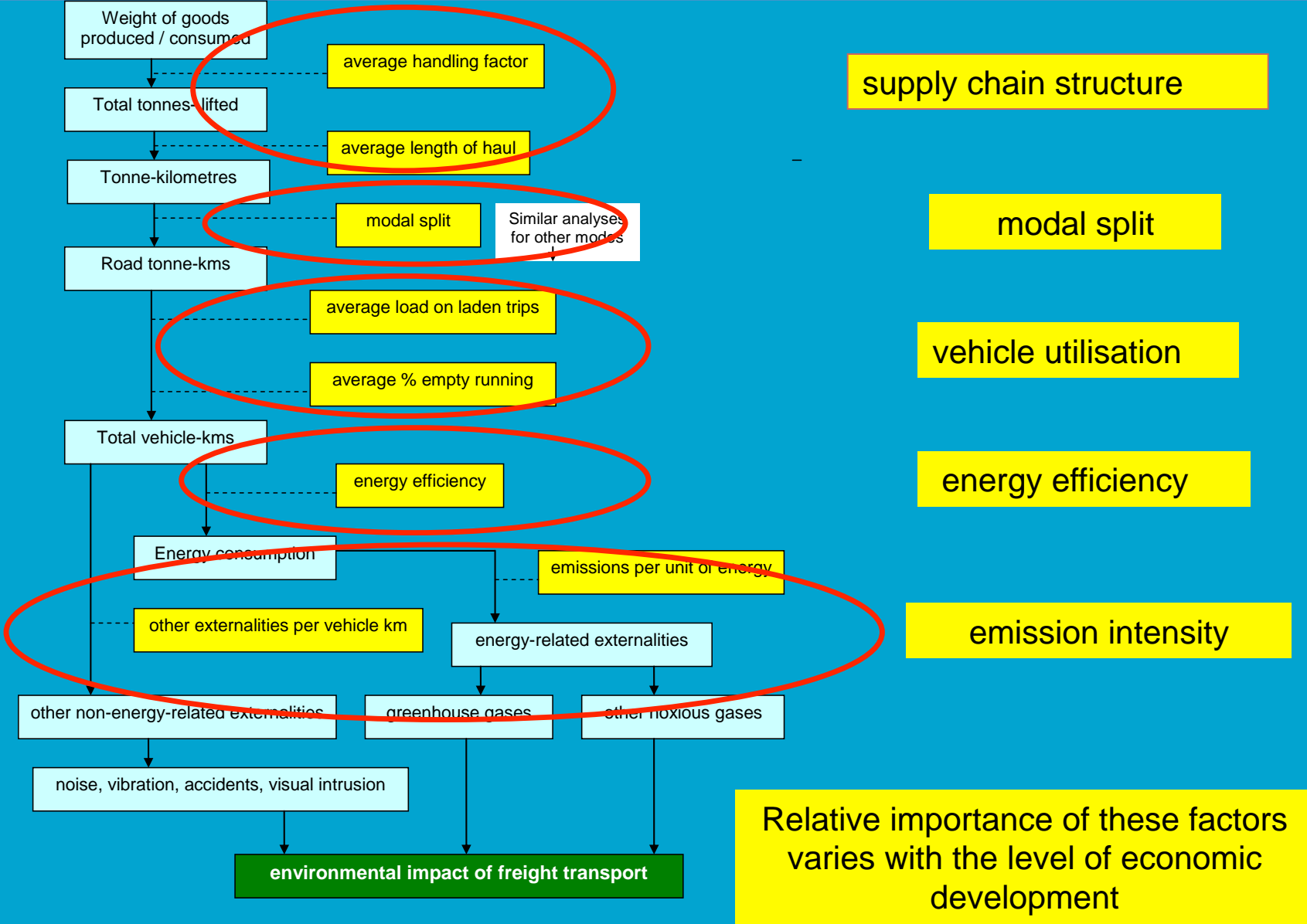
Technological energy efficiency

Vehicle characteristics

Vehicle fuel intensity

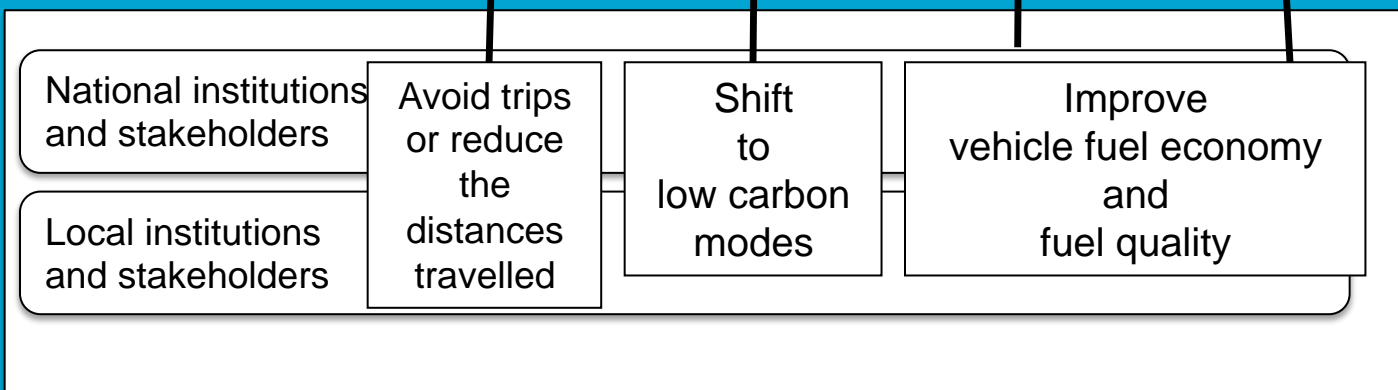
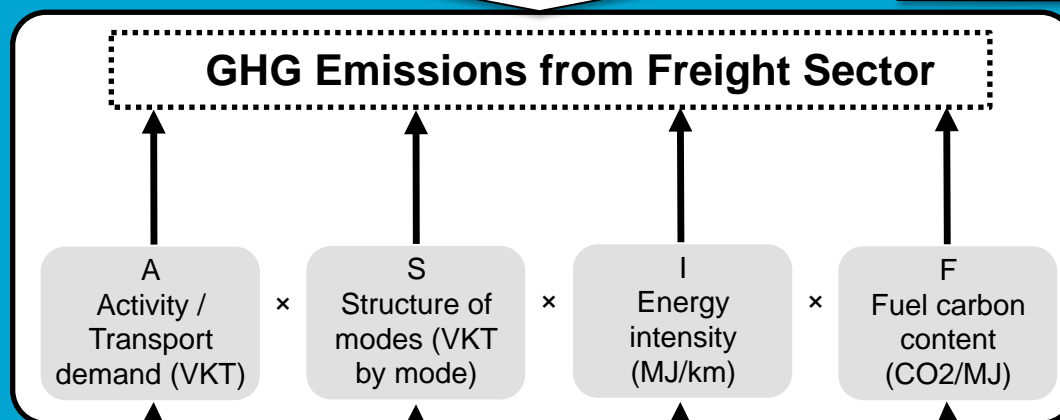
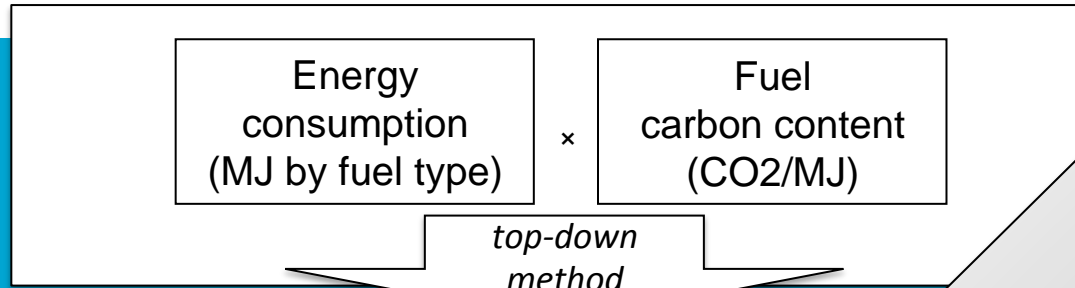
Real drive cycles and routing

# Green Freight Transport Framework

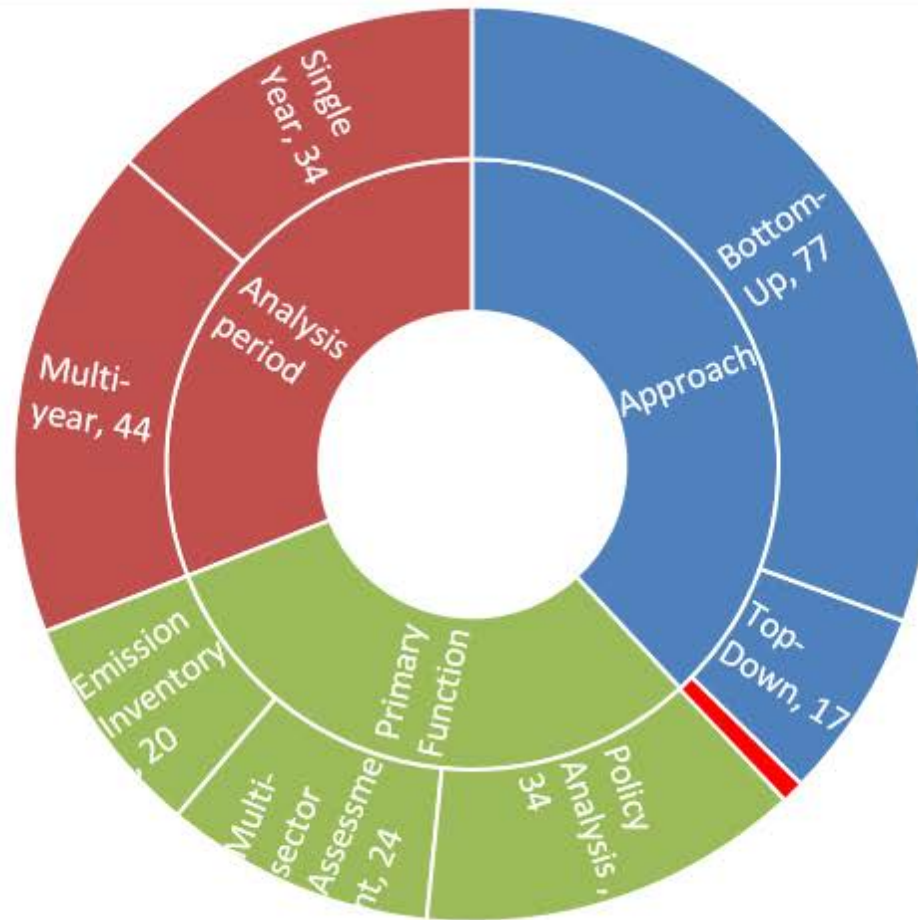


MEASUREMENT

# Measurement of Freight Carbon Emissions (Public sector)



# Measurement of Freight Carbon Emissions - Tools



~ 80 tools applicable for freight sector

~ 50% free

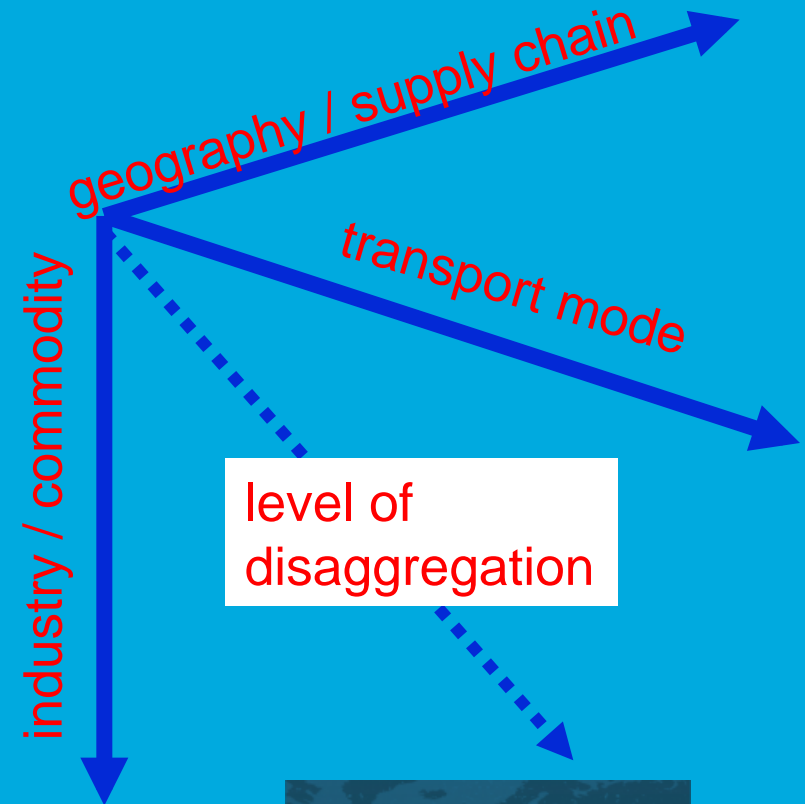
~ Project, Policy, Infrastructure, Program, Fleet, Organisation, Supply Chain

# What standard do you adopt for measuring emissions?

- Greenhouse Gas Protocol
- Clean Cargo Working Group
- World Economic Forum  
*Consignment-level reporting*
- US Smartway
- Green Freight Europe
- China Green Freight Initiative
- CEN
- Green Freight Asia
- EcoTransIT
- NTM

National schemes

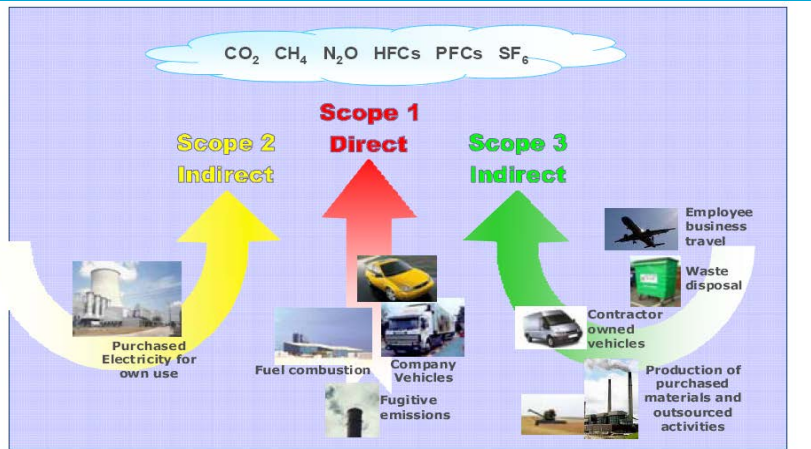
Industry-specific schemes



Aiming to harmonise emission measurement and reporting

# Boundaries around the Carbon Calculation?

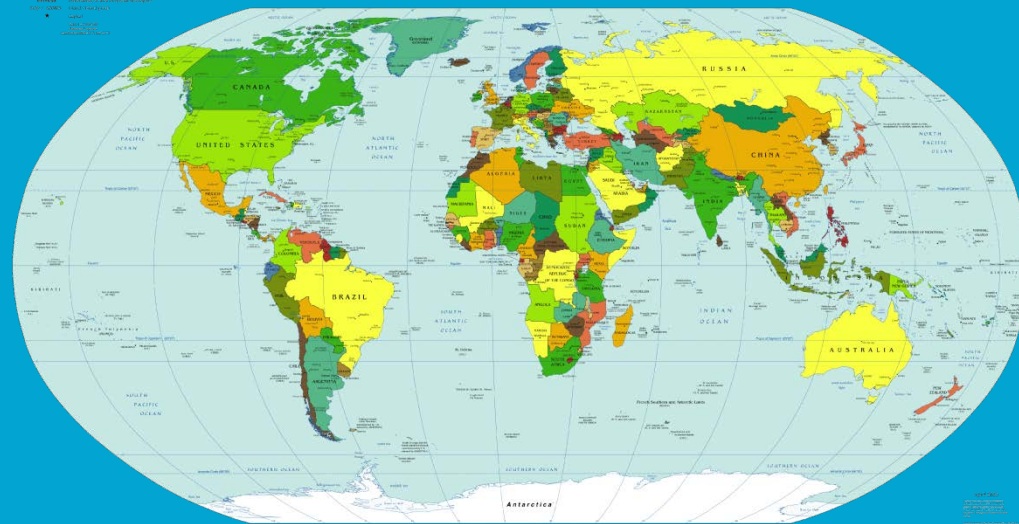
## Organisational



Adapted from NZBCSD and GHG Protocol

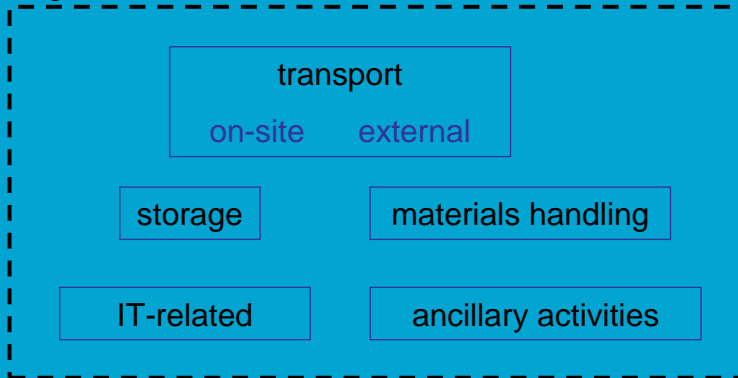
## Geographical

Political Map of the World, April 2006



## Functional

logistics



## Hierarchical

level

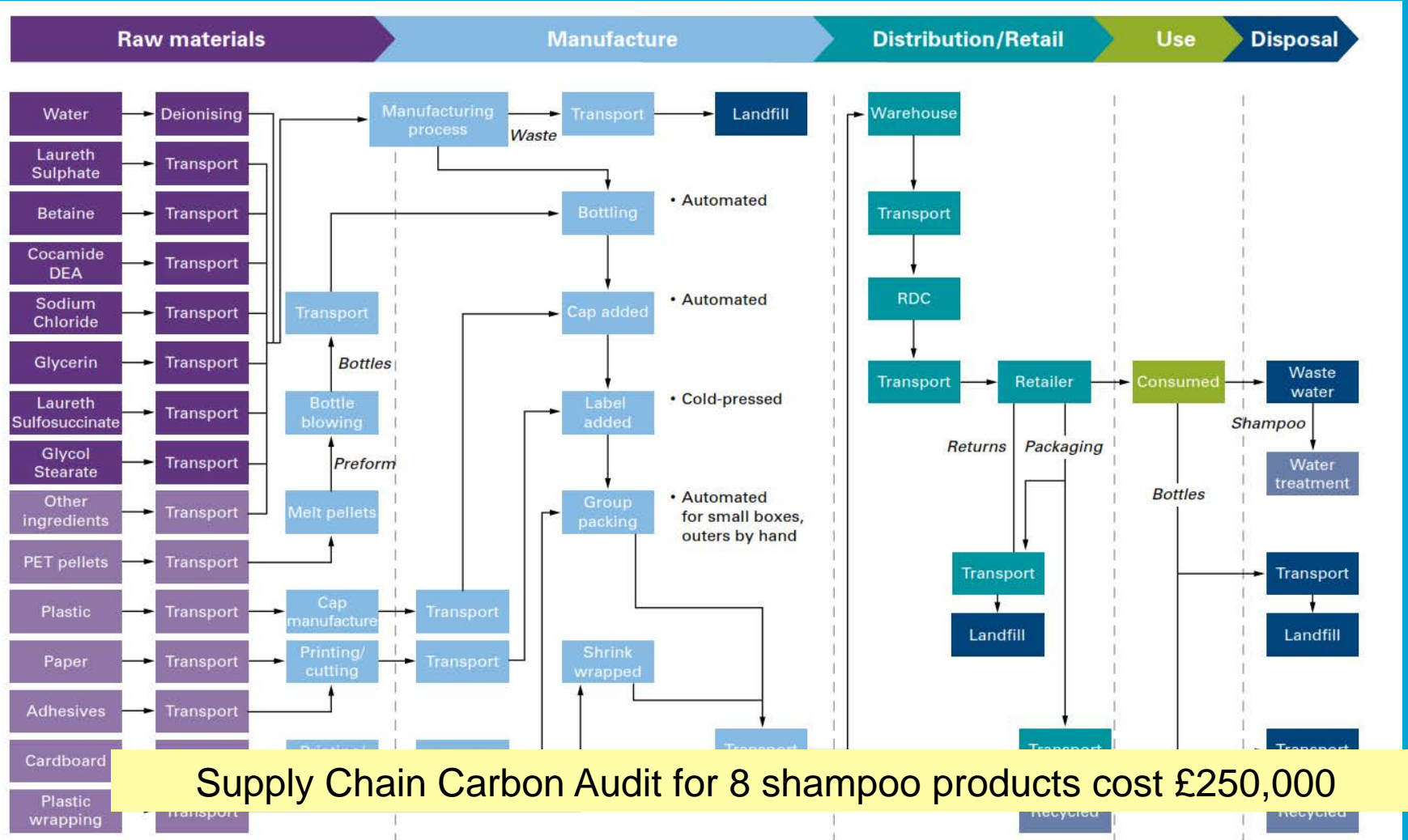
Company	Company	Company	Company
Business unit	Business unit	Business unit	Business unit
Facility	Facility	Facility	Facility
Activity	Activity	Activity	Activity
Product group	Product group	Product group	Product group
Item	Item	Item	Item

supply chain



# Product Level Accounting?

## Supply Chain Process Map for Shampoo



Supply Chain Carbon Audit for 8 shampoo products cost £250,000

Carbon Trust methodology

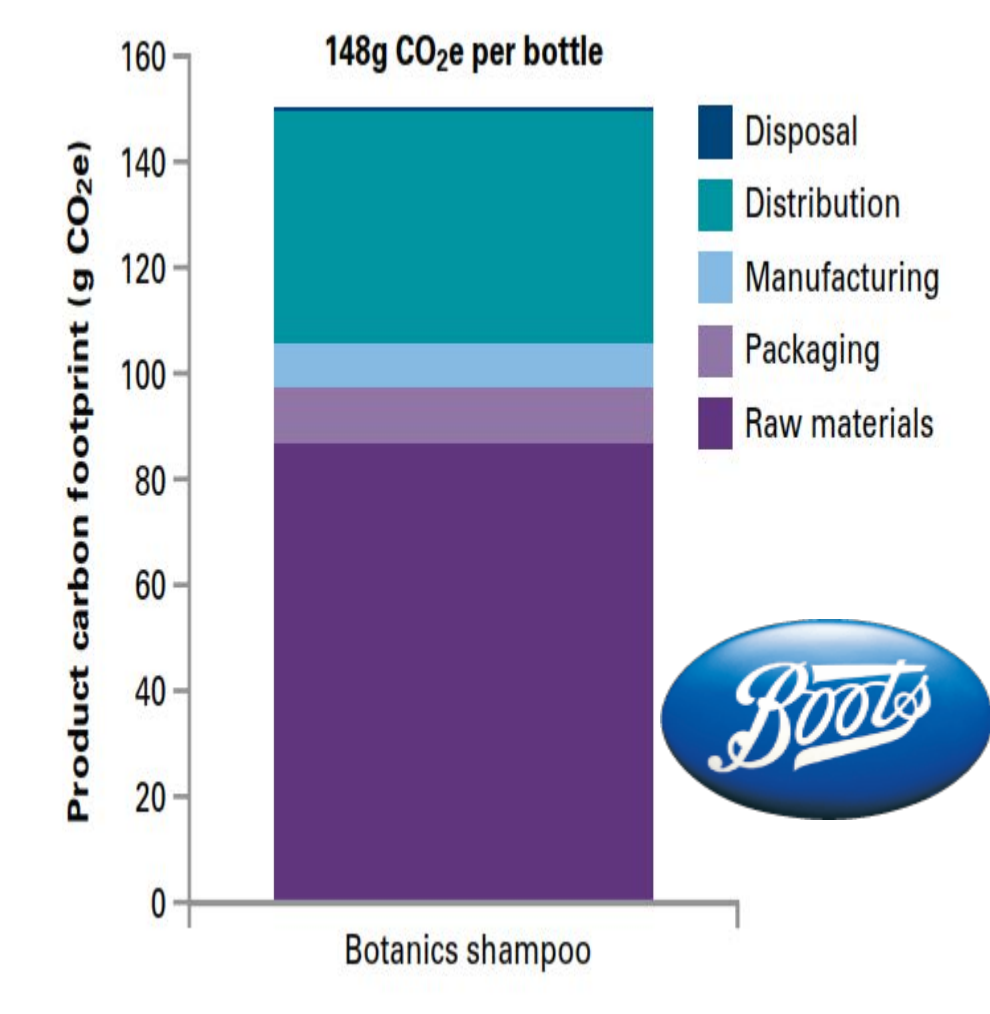
Source: Boots

Raw materials analysed

Disposal



# Product Level Accounting?



**20% decrease in emissions across the product's life cycle**

	% of CO <sub>2</sub>
Materials	5%
Production	0.3%
Distribution	2%
Warming water for hair wash	93%
Retailing / Disposal	Excluded

# Emission Reporting ?

absolute value

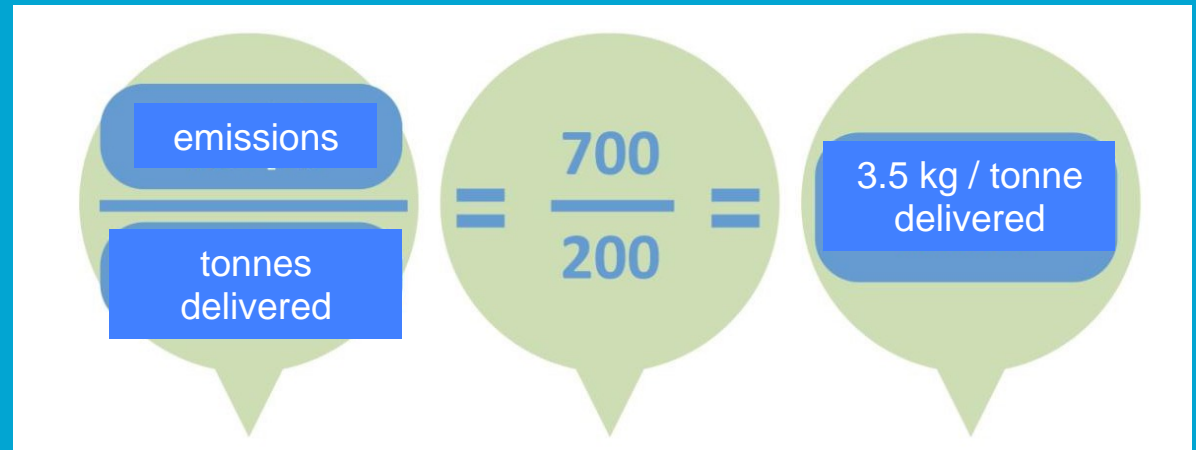


Total level of  
emissions

relative value



emission-intensity index



Choice of denominator / normaliser ?

Typical denominators in the logistics sector

Tonne-kms, Vehicle-kms, Pallets or cases delivered, TEUs , TEU-kms, Jobs

# Measuring Environmental Impacts

10-stage procedure for Micro (company) or Macro assessment

1. Review international environmental reporting standards and obligations
2. Decide on the range of environmental impacts to be measured
3. Decide at what level to measure these impacts (Boundary)
4. Consider basing the assessment on one of the standard methodologies
5. Decide how frequently the assessment should be made
6. Review available data
7. Where necessary, undertake additional data collection & where possible, undertake data 'triangulation'
8. Obtain the relevant emission factors from internal or external sources (e.g gNO<sub>x</sub> per truck-km)
9. Analyse the environmental data
10. Report the results & monitor trends through time and outlining data limitations

# Calculating the Environmental Costs of Freight Transport

- to model the trade-offs between economic, social and environmental objectives using a common metric
- to conduct cost-benefit analyses of measures that reduce the environmental impact of freight transport
- to assess by how much taxes on freight transport would have to rise to recover the cost of the environmental damage it causes
- to calculate a financial rate of return on investments made to improve the environmental performance of freight transport
- to estimate by how much greener transport modes should be subsidised for environmental reasons

**A strong case can be made for monetary valuations of environmental impacts  
It is, nevertheless, a difficult, complex and controversial process**

SETTING TARGET

# Setting Emission Targets - NDC

All changes saved in Drive

▾ Add layer   + Share   ⦿ Preview

- 🚶 Côte d'Ivoire
- 🚶 Democratic Republic of the ...
- 🚶 Dominica
- 🚶 Ethiopia
- 🚶 Gabon
- 🚶 Grenada
- 🚶 Japan
- 🚶 Marshall Islands
- 🚶 Moldova
- 🚶 Seychelles
- 🚶 Brunei

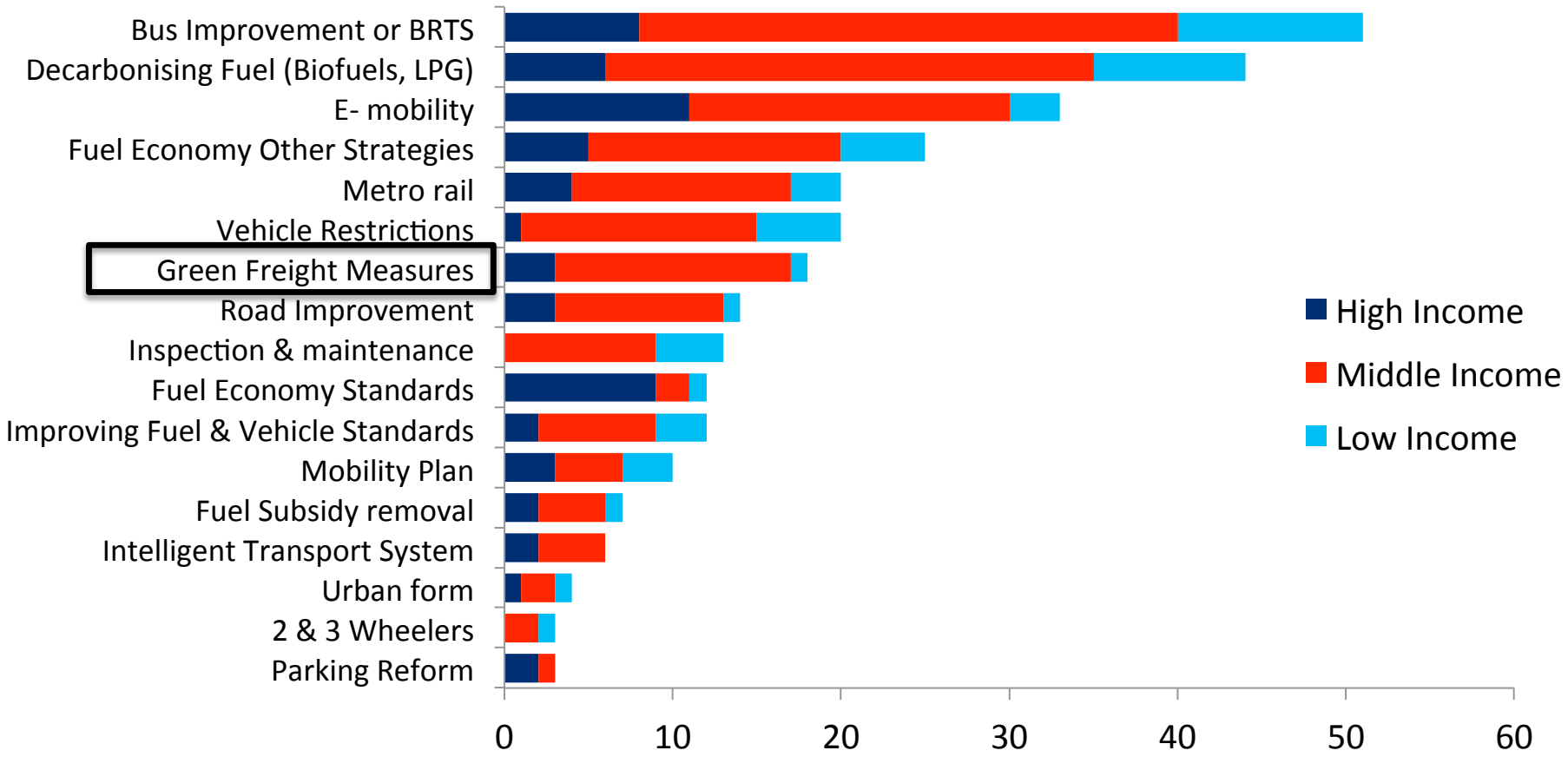
▾ Base map



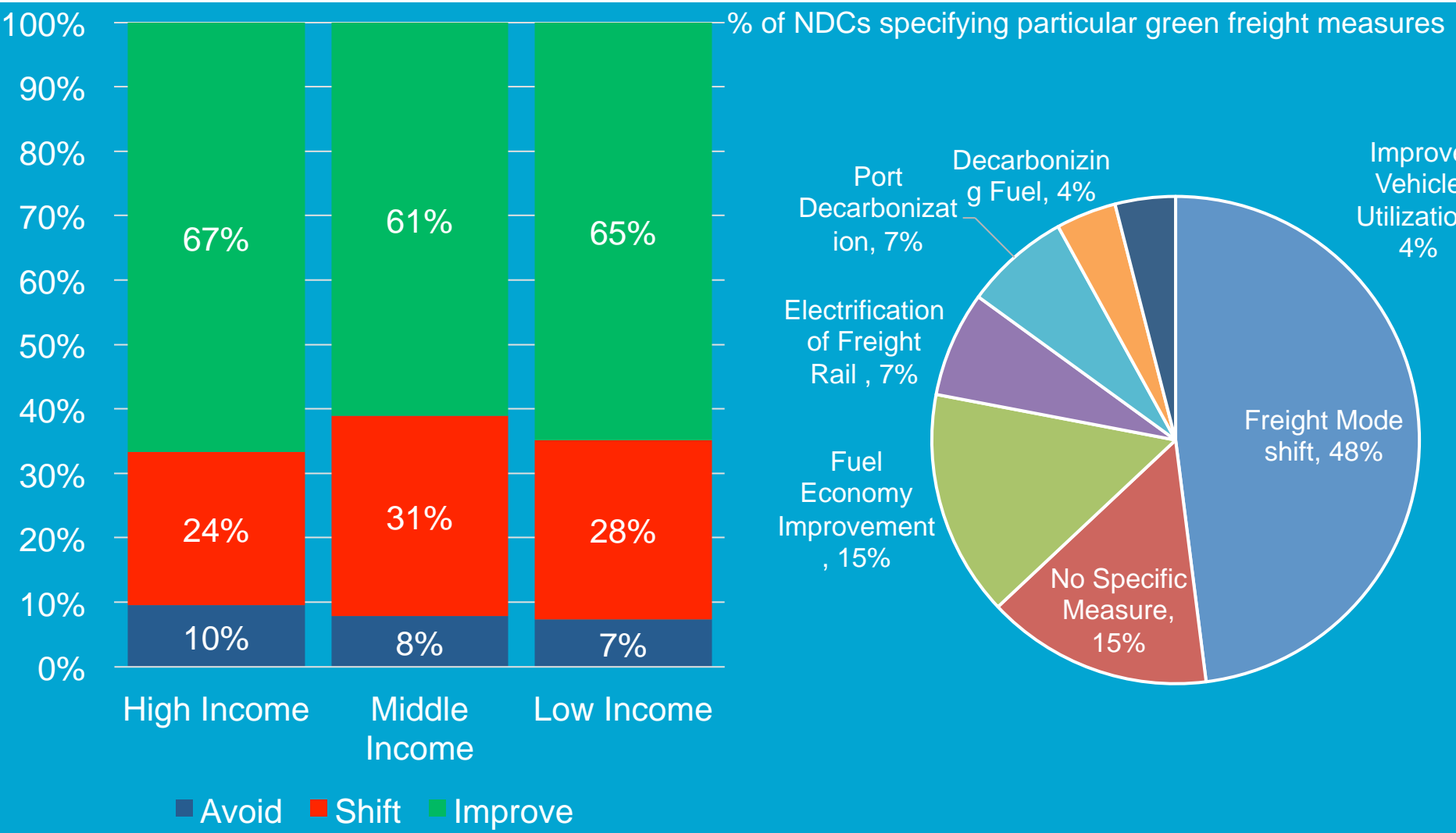
# Setting Emission Targets - NDC

“Freight is currently relatively neglected across INDCs” – SLoCaT (2016)

In NDCs **44%** identify passenger transport but only **14% identify freight**



# Avoid-Shift-Improve - NDCs





# Indonesia Emission Target (Developing Country)

2020

-41%  
(2030)

with international support

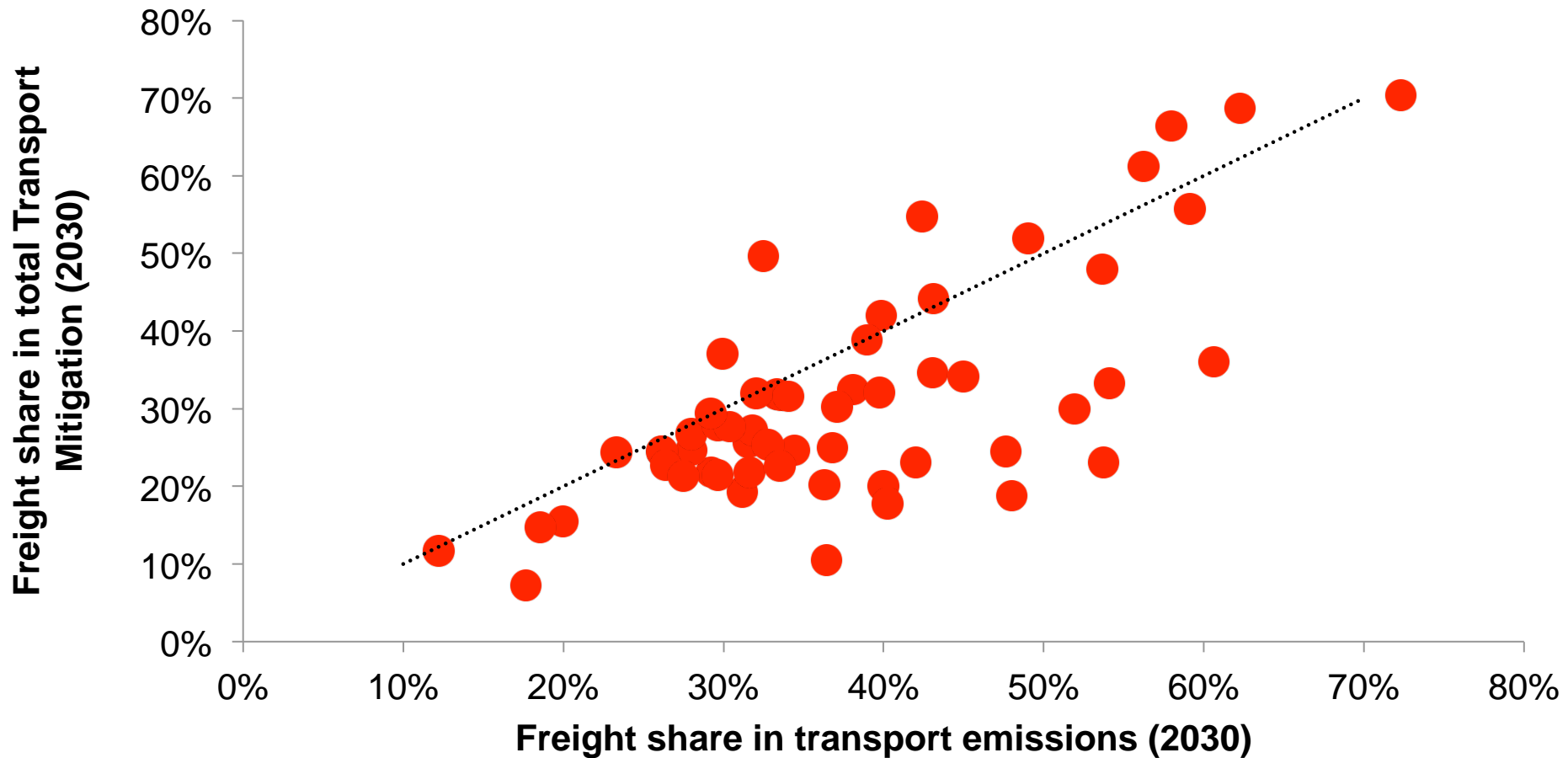
-26% (2030-29%)

without international support

Sector allocations	Forestry + Peat	Agriculture	Power - energy	Transport	Waste	Industry
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Sectors	Emission Share (%)	Emission Reduction Target share (%)	
		26%	41%
Forestry & Peatland	62.93	87.84	87.38
Agriculture	4.47	1.05	0.93
<b>Energy &amp; Transportation</b>	<b>20.60</b>	<b>4.71</b>	<b>4.71</b>
Industry	2.71	0.13	0.42
Waste	9.29	6.27	6.56

# Freight Sector Contribution?

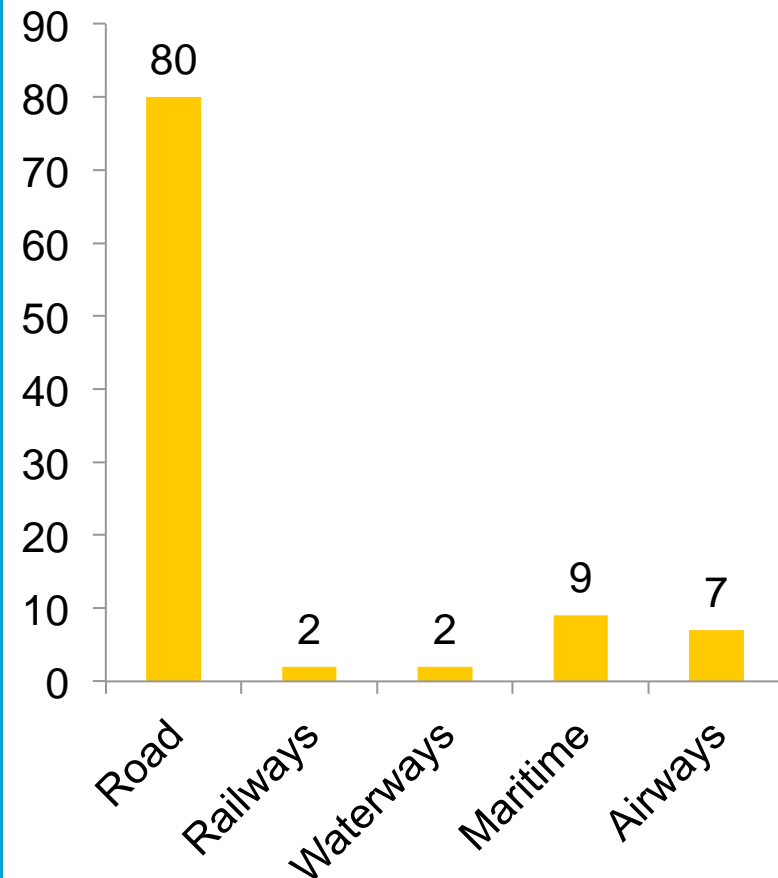


In **80% of studies**, freight sector did not even contribute its equivalent share of emissions to the total mitigation.

# National Mode Share Targets

1. Vietnam's Inland waterways targets a market share increase of 25% by 2020
2. Laos - Inland waterways targets 30% of transport volume in 2020.
3. Korea - 20% volume by rail by 2020
4. Argentina - increase rail freight share from 2% to 20% by 2020
5. India - rail freight increase from 35% at 2005 to 50% by 2020
6. Japan - Rail & coastal shipping to increase from 39.6% (2000) to 50% (2010)
7. Bangladesh – 30% for rail & coastal shipping by 2014
8. Brazil - Increase rail and waterways mode share from 25 to 35% (Rail) and 13 to 29% (Waterways) by 2025

**Vietnam - Public Investment in Transport 1999-2007 (%)**



# Setting Targets – Private Sector



# Setting Targets

## Reasons for Establishing an Environmental Improvement Target

- Sets clear goal for the organisation
- Motivates management and staff
- Provides a benchmark against which improvements can be measured
- Demonstrates organisation's commitment to greening the transport operation
- May yield some marketing / political benefit

## Differences between corporate green freight targets and other business targets

- Alignment with external industry and government targets
- Visibility – declaring targets for Corporate Social Responsibility (CSR) and marketing reasons

# Setting Targets

Imposition of corporate environmental targets  
Often based on targets set by government,  
trade bodies or competitors

**Top-down approach**



**Bottom-up approach**



Analysis of potential  
environmental improvement and  
methods of achieving it –  
against business- as-usual trend

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## Problems with the Top-Down Approach to Targeting

1. Not based on an analysis of the potential savings – lacking credibility
2. Often fails to recognise differences between companies and sectors:
3. Ignores wide inter-functional and inter-sectoral differences in the potential for and cost-effectiveness of environmental improvement

# Setting Targets

Bottom-up or Top-down

Absolute or Intensity

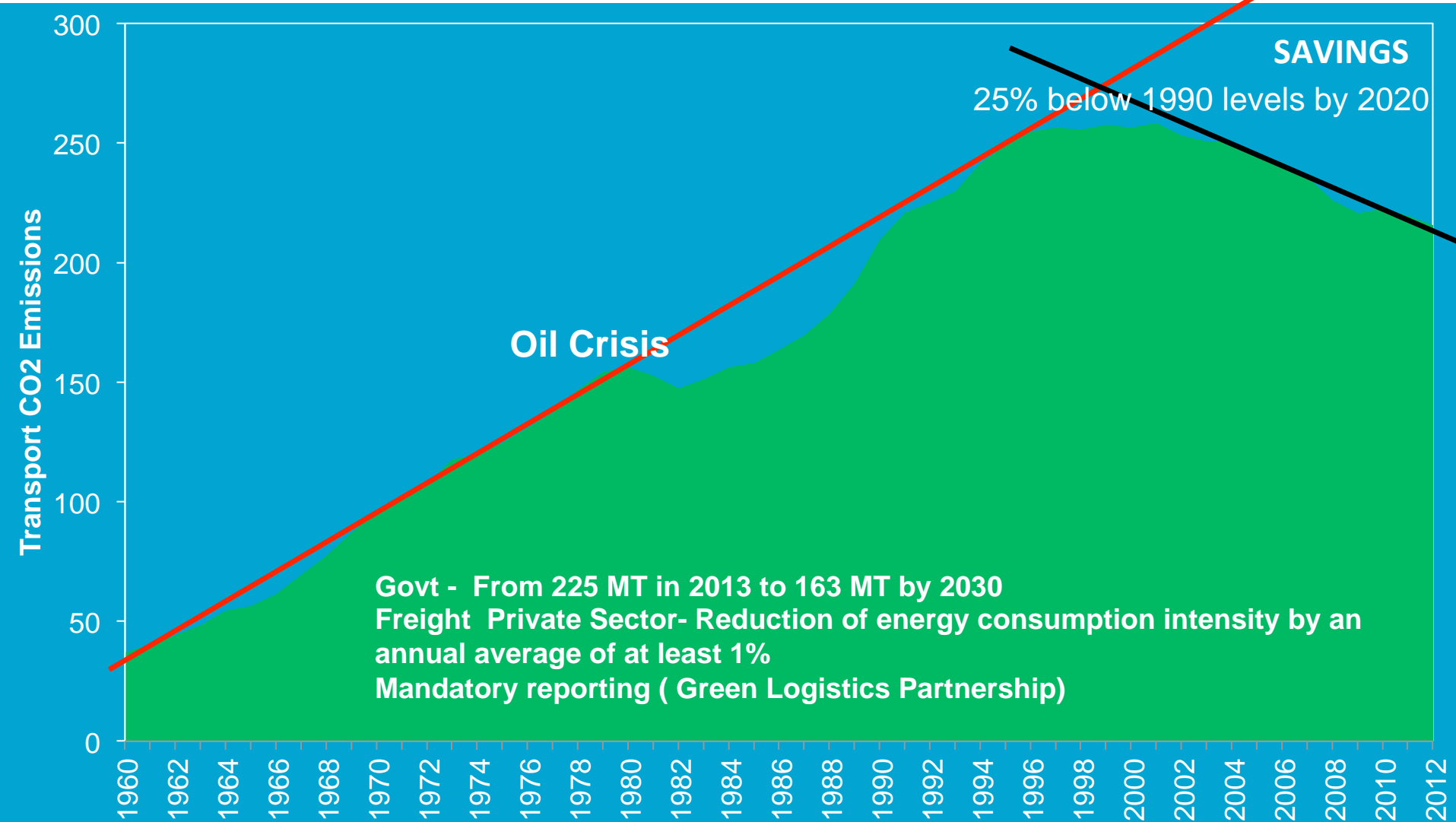
Varying scope

Differing time-scales

Degree of reliance on carbon offsetting

- Differing start and end dates frustrates the comparison of targets
- Tendency to choose earlier base year to include past emission reducing initiatives
- Long term targets lack credibility – *need interim targets*
- Should try to align dates with government and industry-level targeting

# Japan's Logistics CO2 Target





# Private Sector Emission Target

Company	Targets	Indicator
Casio	a 22% reduction per unit of domestic sales in fiscal 2013 compared to fiscal 2006	CO2/Sales
Toyota	Reduce emissions per freight unit by 14% by 2020 from 2006 using logistics	CO2/ tonkm
Komatsu	8% reduction in CO2 per Cargo Weight in 2015 with 2011	CO2/Weight
Sharp	CO2 emissions per shipping volume by 1% or greater/year	CO2/ Volume
Omron	Global net sales to CO2 emissions improvement by 30% by 2020 (2010 baseline)	Sales/CO2 Emissions
<b>Sagawa Express</b>	<b>Reduction of gross CO2 emission by 6% (compared to fiscal year 2002) before FY 2012</b>	<b>Gross CO2 Emissions</b>

Toyota  
(g CO2/tonkm)

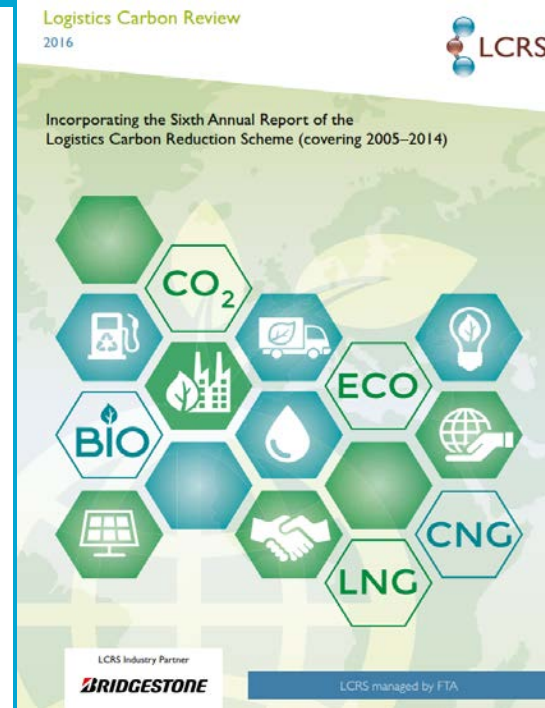
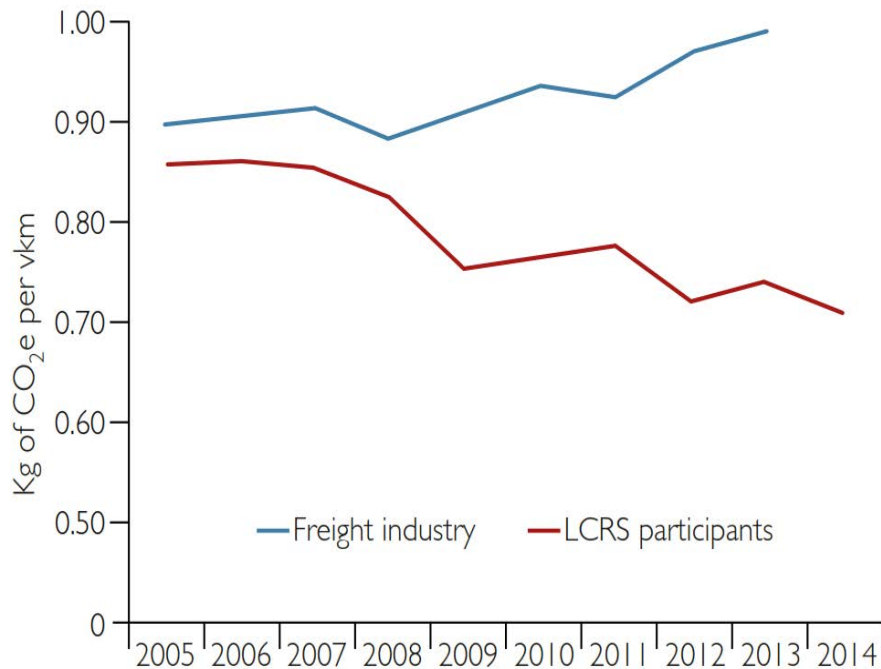
2006 – 127.2  
 2011 – 107.7  
 2012 – 106.7  
 2013 – 106.6  
 2014 – 109.6  
 2020 - **109.4**

# Industry-level Target-setting for Logistics Carbon Reduction

Conform to targets set by industry trade-body

- confers credibility
- helps build industry momentum for decarbonisation
- encourages more consistent, responsible approach
- 'outsources' the target-setting exercise

## UK Logistics Carbon Reduction Scheme



Currently, 120 companies with 84,000 vehicles (15% of HGVs)

Target reduction of 8% in carbon intensity of freight transport 2010-2015

Endorsed by the UK Government

# 6 Principles of Target Setting for Green Freight Transport

- Targets should be based on a **bottom-up analysis** of the potential for and cost of cutting emissions over particular time-frames.
- Where possible, targets should apply to the **whole logistics operation** in recognition of the environmental trade-offs that exist between logistical activities.
- Targets can be expressed in terms of **emission intensity** with transport output measures (e.g. tonne-kms) used as the normalisers.
- Where the target period is greater than 3-4 years, '**bridging**' targets should be set for **intervening years** to show the trajectory for environmental improvement.
- The **scope** of the environmental improvement and related target should be made **explicit**, delimiting the relevant organisational, geographical, functional and hierarchical boundaries.
- Where appropriate, a company should **join an industry-wide green freight scheme** and conform to the targets that it sets.

# Freight Data & KPI's

- How much freight is being moved?
- Where is the freight going and where it is coming from?
- What is the relative use of different transport modes?
- What is the quality of freight infrastructure
- How efficiently is freight being transported?
- How does freight transport performance compare among neighboring countries/cities/competitor companies?

Harmonize

Partnership to  
avoid double  
counting

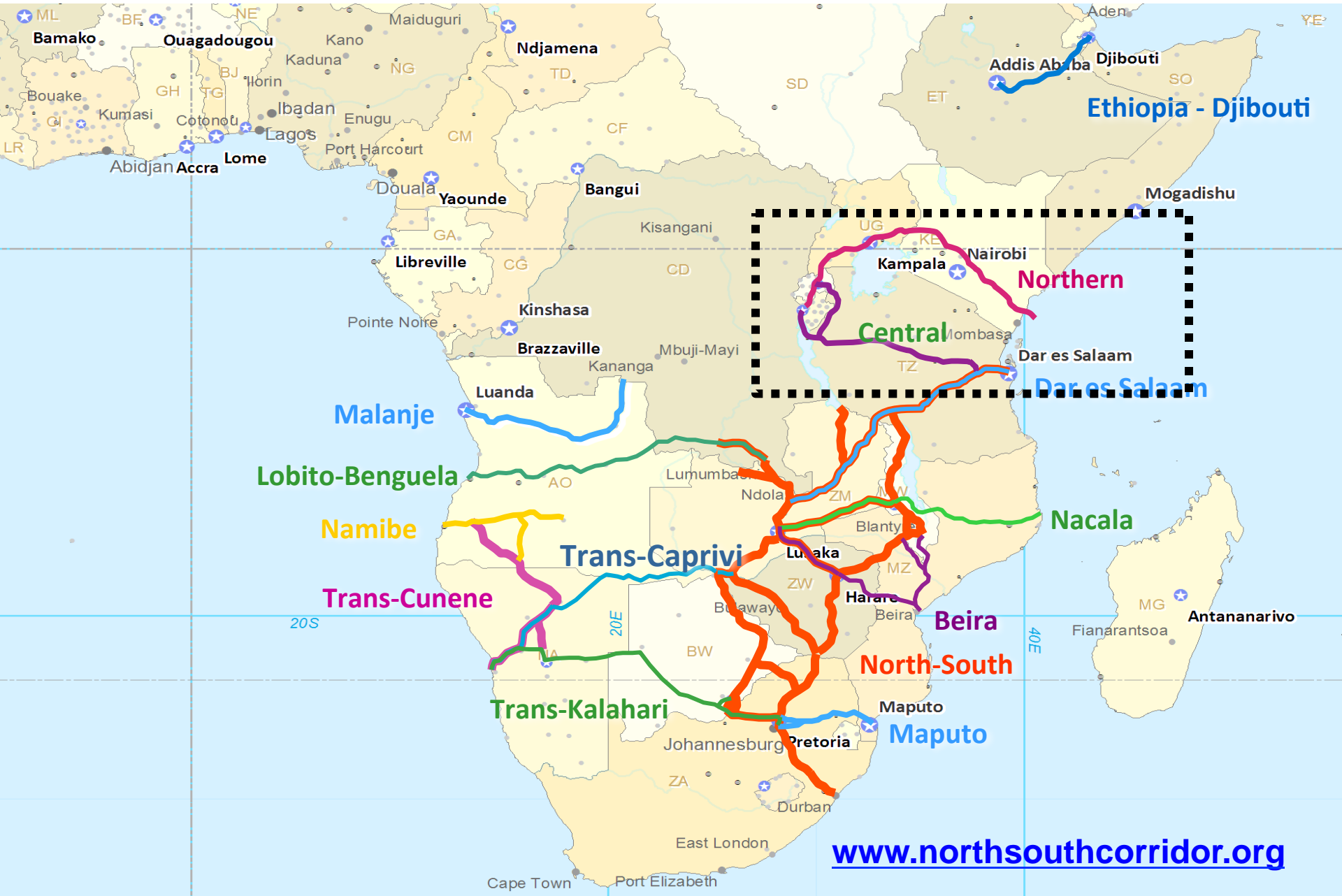
Improve  
Capacity

Multi-year  
program

Silver Bullet vs  
Analysis  
Paralysis

EXAMPLE

# Northern Corridor in East Africa



# Green Freight Strategy

Setting the objectives

Engaging stakeholders

Compiling the necessary data

Measurement

Devising realistic targets

Identifying / evaluating initiatives

**The Northern Corridor Vision is to be a seamless, economic, smart and green transport corridor**

Below are draft short term targets for the period **2016 baseline to 2021**:

1. Improved fuel economy (litres per tonkm) for trucks by at least 5% by 2021 (reduction);
2. Reduction in Particulate Matter(PM), black carbon emissions and Oxides of nitrogen (NOX) grams per tonkm by at least 10% by 2021;
3. Reduction of CO2 emission intensity grams per tonkm by 10% by 2021;
4. Reduction of road accident fatality by 10% per million truck kilometer

*possible criteria*

Feasibility  
Time-scales

Required level of investment  
Likely stakeholder support

Cost effectiveness  
Possible co-benefits

Ease of implementation  
Skill requirements

# Thank you!



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