

Join the 5th Transport and Climate Change Week

May 9 – 13, 2022

#wechangetransport

transportweek.org



On behalf of:



of the Federal Republic of Germany

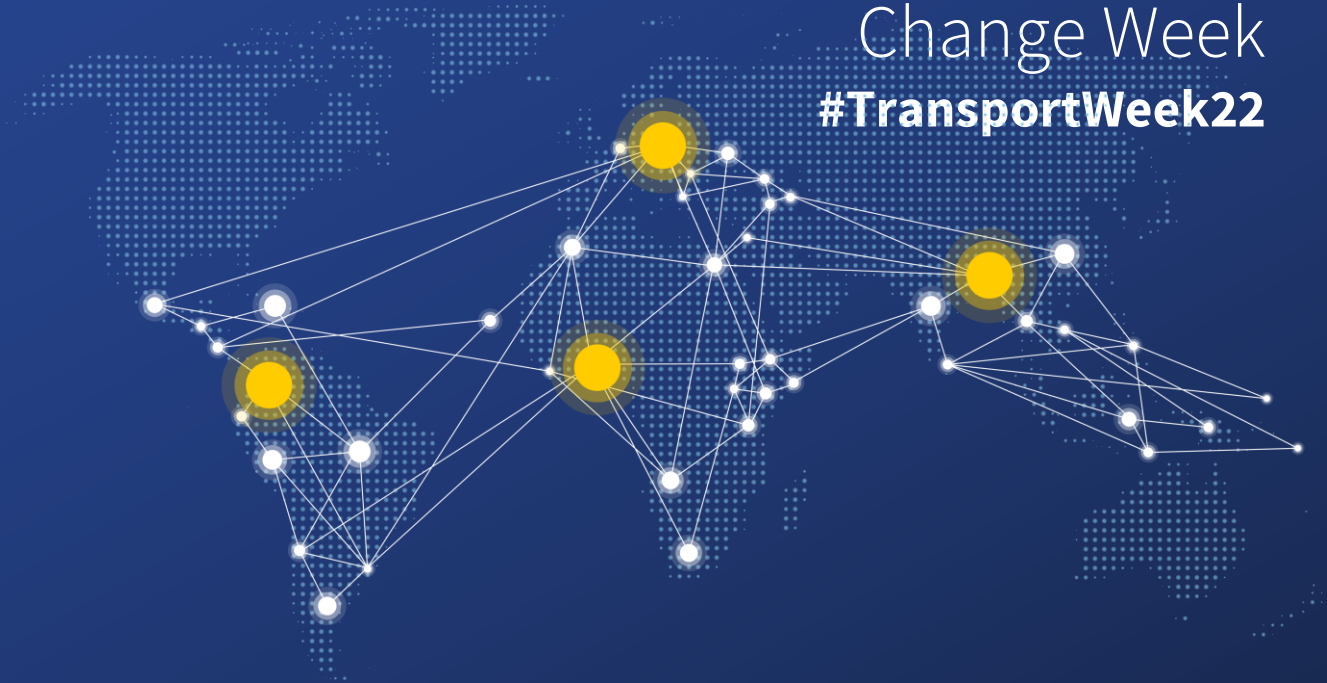


CHANGING TRANSPORT
Facilitating climate actions in mobility



Regional Collaboration Centre – Bangkok
Promoting Action Against Climate Change

Transport and Climate
Change Week
#TransportWeek22



Which data are necessary for baseline development in the transport sector?

UN Climate Change & UNFCCC-IGES Regional Collaboration Centre for Asia and the Pacific in Bangkok

Agenda

- | | | |
|-----------|------------|--|
| 01 | 2' | Introduction |
| 02 | 3' | Welcome remarks |
| 03 | 15' | Presentation: Key outcomes of COP 26 and tracking of progress of implementation and achievement of NDCs |
| 04 | 15' | Presentation: Baseline Development for the Transport Sector |
| 05 | 20' | Questions and Answers |
| 06 | 60' | Hands-on exercise |
| 07 | 5' | Next steps and way forward |

Speakers



Jens Radschinski
Regional lead, RCC Bangkok
UN Climate Change



Marlan Pillay
Programme Officer
UN Climate Change



Gajanana Hegde
Team Lead
UN Climate Change



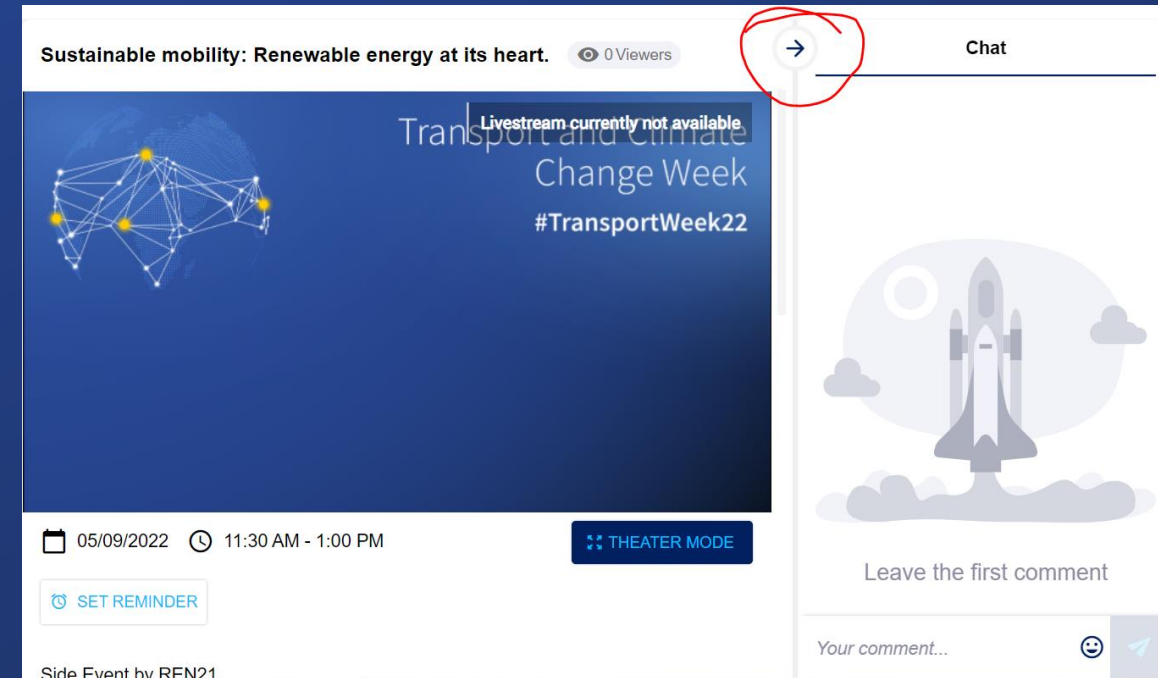
Eduardo Cardoso Filho
Associate Programme
Officer
UN Climate Change



Yuqing Ariel Yu
Technical officer
RCC Bangkok

Eitquettes

- Our event will be recorded;
- Please send your questions in the Chat box;
- The link to download the presentations and the documents for the hands-on exercise will be shared in the Chat box;
- Engage on social media, using the hashtags **#TransportWeek22** and **#WeChangeTransport**;
- **Networking Lounge (Break Time):** [Transport Lounge | Wonder](#) where participants can meet via video chat.



**Key outcomes of COP26 and tracking of
progress of implementation and
achievement of NDCs**



OVERALL OUTCOMES



31 OCT - 12 NOV 2021
GLASGOW

COP26

IN PARTNERSHIP WITH ITALY



- Launched the process (work programme) to define the global goal of **adaptation**; goal to double finance for adaptation; enhanced support on loss and damage;
- Addressed the need to improve the delivery of climate **finance** (100 billion USD goal between 2020 – 2025); initiate the process to define the new goal on **finance** post 2025;
- Identified ways to **close the emission gap**:
 - ✓ Phase down coal and remove fossil fuel subsidies;
 - ✓ Sectoral pledges on: methane reductions; forest, land, and ocean; electric vehicles; and other private sector initiatives;
 - ✓ NDC synthesis annual update;
- Completed the Paris Agreement Rulebook** (Transparency, NDC common timeframe, Article 6)



Key provisions on BTRs

MPGs for the ETF, 18/CMA.1

- Parties shall submit their **1st BTR and NIR** (if submitted as a stand-alone document), in accordance with the MPGs (18/CMA.1) **at the latest by 31 December 2024**
- **LDCs and SIDS** may submit BTRs **at their discretion**
- **Technical analysis of REDD+ activities on result-based payments**, if applicable, to be submitted as an **Annex to the BTRs**
- If **adaptation communication** is submitted as a component of BTR, clearly identify the relevant part
- **Flexibility provisions** are specified in MPGs, for those developing country Parties that need it in the light of their capacities → application of the flexibility is to be **self-determined**
- **Information on flexibility and improvements** in reporting over time to be provided as part of the BTRs
- BTR outline, common reporting tables and formats are adopted by decision **5/CMA.3**

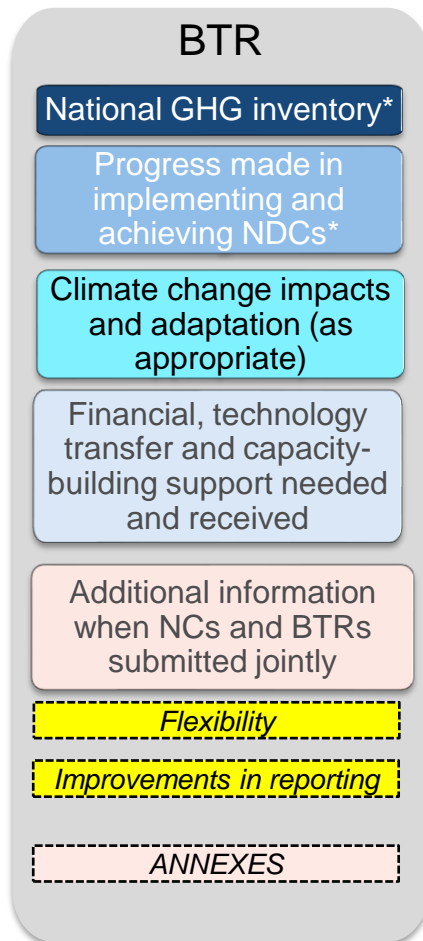
REDD+: reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks (decision 1/CP.16, para. 70).

CONTENT:

- national inventory report of GHGs **[shall]**
- tracking progress in implementing and achieving its NDC **[shall]**
- climate change impacts and adaptation **[should]**
- FTC support **provided** [developed country Parties: **shall**; developing country Parties **should**, if applicable]
- FTC support **needed and received** [developing country Parties: **should**]



Outline of the BTR (Decision 5/CMA.3, Annex IV)



Overview chapter

- I. National **inventory** report of anthropogenic emissions by sources and removals by sinks of GHGs (MPGs, para. 17-58)
- II. **Information necessary to track progress made in implementing and achieving NDCs under Article 4 of the Paris Agreement** (MPGs, para. 59-103)
- III. Information related to **climate change impacts and adaptation** under Article 7 of the Paris Agreement (MPGs, para. 104-117)
- IV. Information on financial, technology development and transfer and capacity-building support **provided and mobilized** under Articles 9–11 of the Paris Agreement (MPGs, para. 118-129)
- V. Information on financial, technology development and transfer and capacity-building **support needed and received** under Articles 9–11 of the Paris Agreement (MPGs, para. 130-145)
- VI. Information to be reported **when NCs and BTRs are submitted jointly** every four years (1/CP.24, para. 43) (*vulnerability assessment, cc impacts and adaptation measures-if not reported in section III; RSO; education, training and public awareness*)
- VII. Information on **flexibility** (MPGs, para. 6) (*Indication of (1) reporting provisions to which self-determined flexibility is applied, (2) capacity constraints in relation to the application of flexibility and (3) self-determined estimated time frames for improvements in relation to those capacity constraints*)
- VIII. Improvements in reporting** over time (MPGs, para. 7-8) (*areas of improvement, how these will be addressed, which areas are related to flexibility provisions, reporting-related CB support needs*)
- IX. Any other information the Party considers relevant to the achievement of the objective of the Paris Agreement, and suitable for inclusion in its BTR

Annexes: (i) **Technical annexes for REDD+**, as applicable; (ii) **CRTs for electronic reporting of NIR**; (iii) **CTFs for electronic reporting of tracking progress in NDCs, FTC support** provided/mobilized and/or needed and received; (iv) Information in relation to the Party's **participation in cooperative approaches**, as applicable



Provisions for NDCs – Tracking of progress as per MPGs

18/CMA.1 MPGs for ETF

*(MPGs: Modalities,
Procedures and
guidelines)*

- To provide clear understanding of climate action including clarity and tracking progress towards achieving Parties' individual NDCs under Article 4, to inform GST
- Tracking of progress is directly linked with the accounting for NDCs
- Each Party shall provide information to **track** progress through a structured summary in their BTRs



Description of NDCs

Information (as applicable) describing their NDC against which progress will be tracked.

1. Target(s), including a description and the target type(s) (e.g. economy-wide absolute emissions reduction, emissions intensity reduction, emissions reductions below a projected baseline, mitigation co-benefits of adaptation actions or economic diversification plans, policies and measures, and other);

2. Target year(s) or period(s), and whether they are single-year or multi-year target(s);

3. Reference point(s), level(s), baseline(s), base year(s) or starting point(s), and their respective value(s);

4. Time frame(s) and/or periods for implementation

5. Scope and coverage, including, as relevant, sectors, categories, activities, sources and sinks, pools and gases;

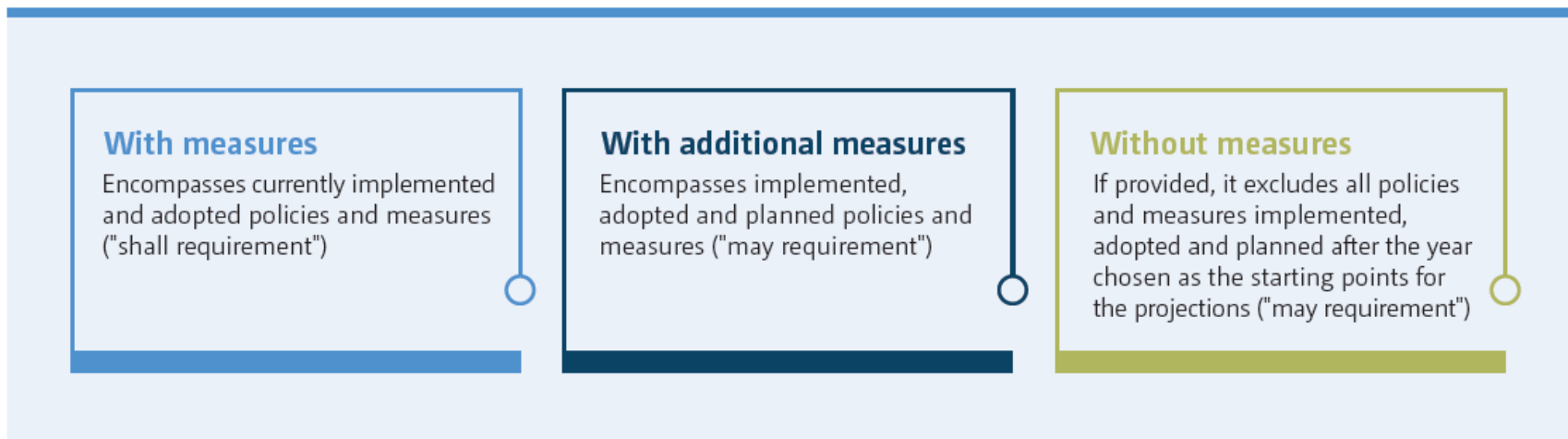
6. Intention to use cooperative approaches that involve the use of internationally transferred mitigation outcomes under Article 6 towards NDCs;

7. Any updates or clarifications of previously reported information (e.g. recalculation of previously reported inventory data, or greater detail on methodologies or use of cooperative approaches).



Projections of GHG emissions and removals

Scenarios for projections of greenhouse gas emissions and removals

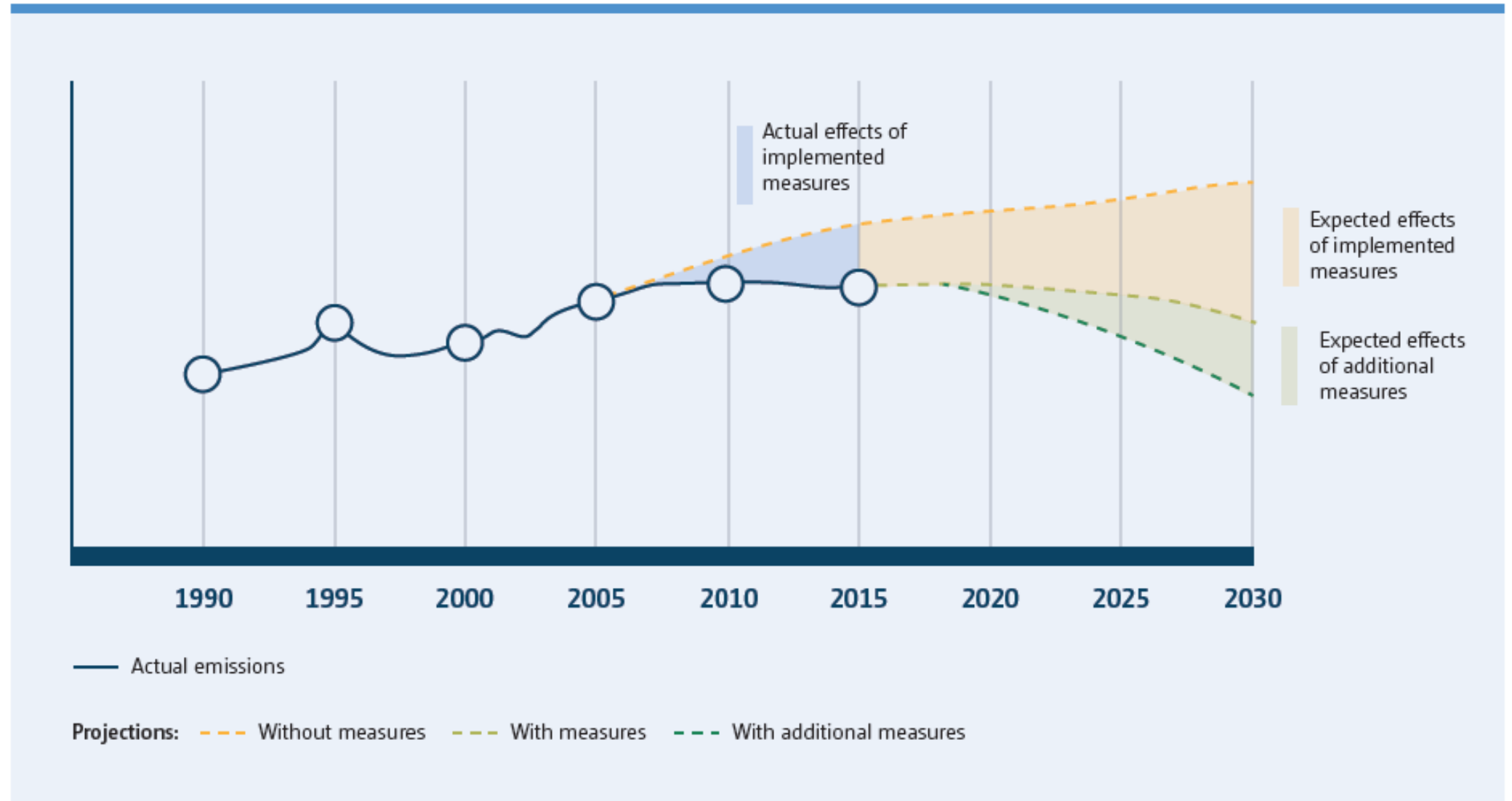


- Those developing country Parties that need flexibility in the light of their capacities are instead encouraged to report these projections; they can report using a less detailed methodology or coverage
- Meant to provide an indicative picture of the impact of mitigation policies and measures on the future trends of GHG emissions and removals, and not be used to assess progress towards the implementation and achievement of a Party's NDC unless the Party has identified a reported projection as its baseline for its NDCs

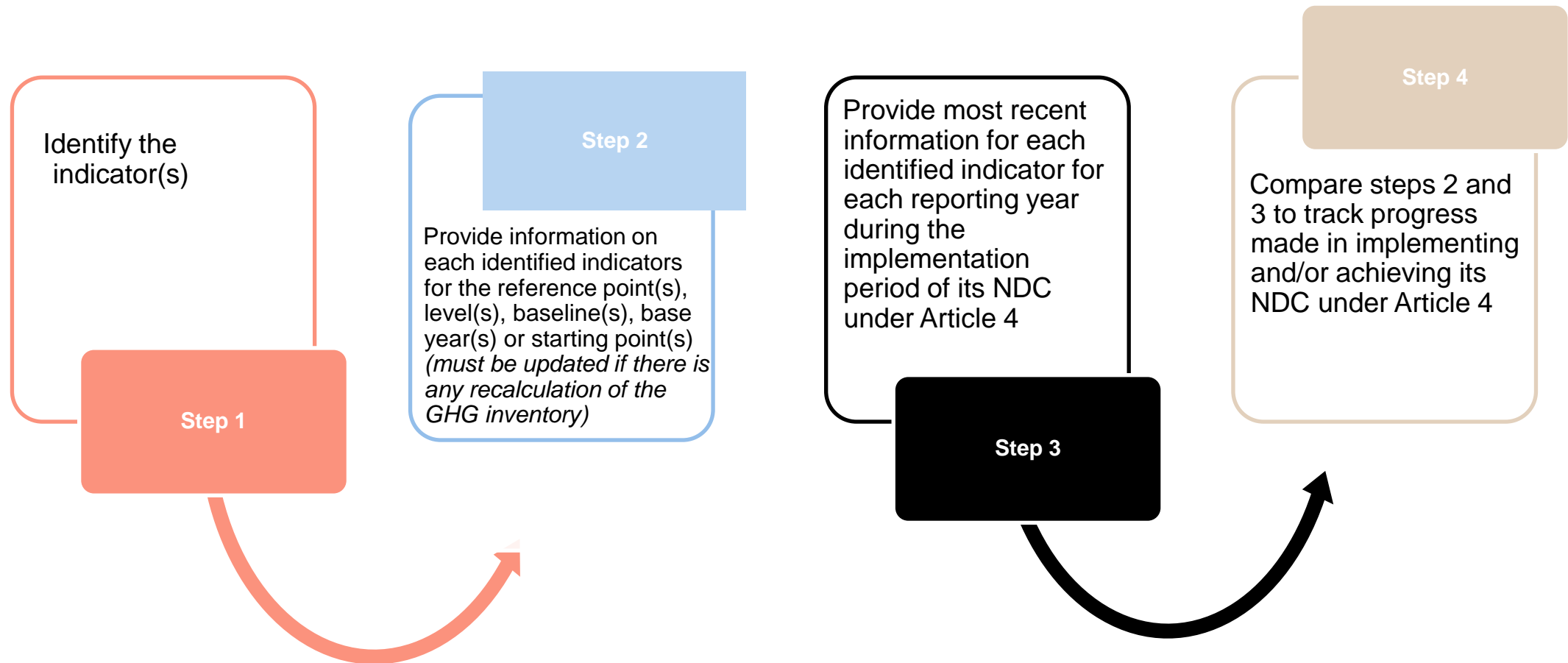


Figure 7

Hypothetical projections of greenhouse gas emissions and removals under different scenarios



General algorithm for tracking progress



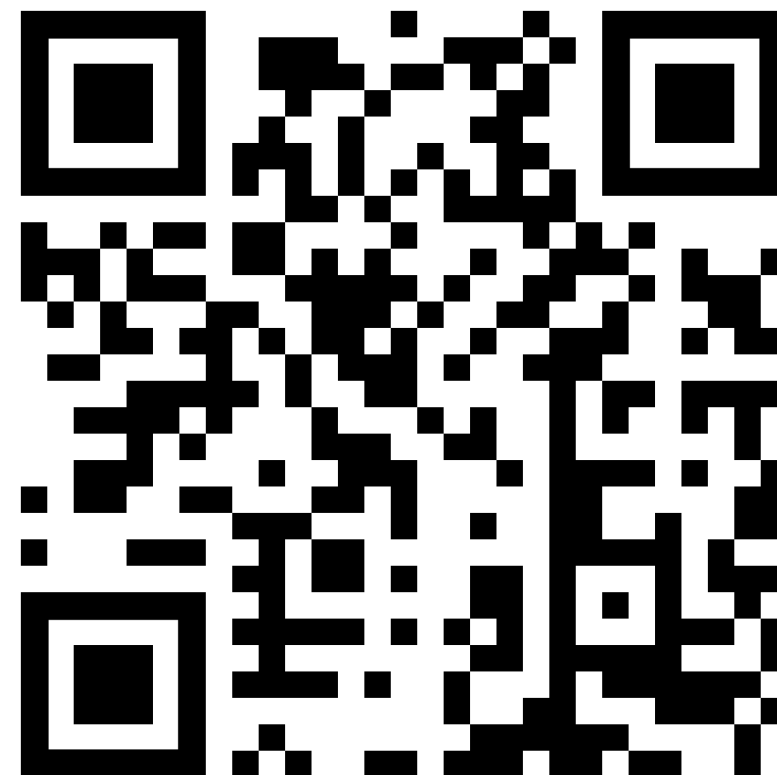
Technical handbook for developing country Parties on

Preparing for implementation of the enhanced transparency framework under the Paris Agreement

First Edition
(June 2020)



United Nations
Framework Convention on
Climate Change



<https://unfccc.int/documents/267112>

Compendium



https://unfccc.int/sites/default/files/resource/Transport_0.pdf



Thank you!

tisu@unfccc.int



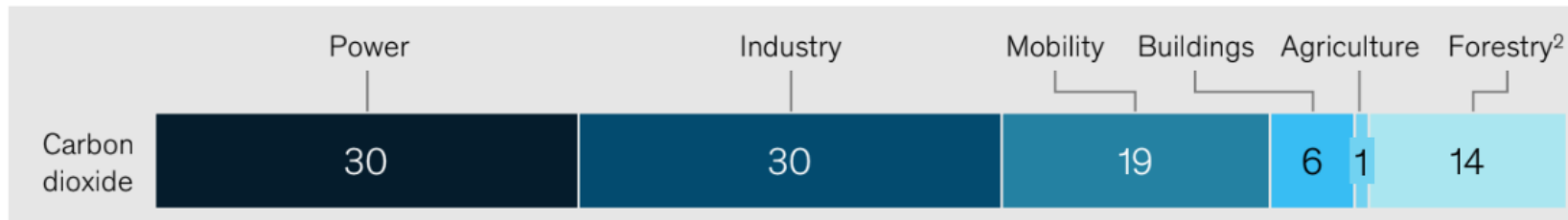
BASELINE DEVELOPMENT FOR THE TRANSPORT SECTOR

Transport and Climate Change Week



The net-zero transition: What it would cost, what it could bring

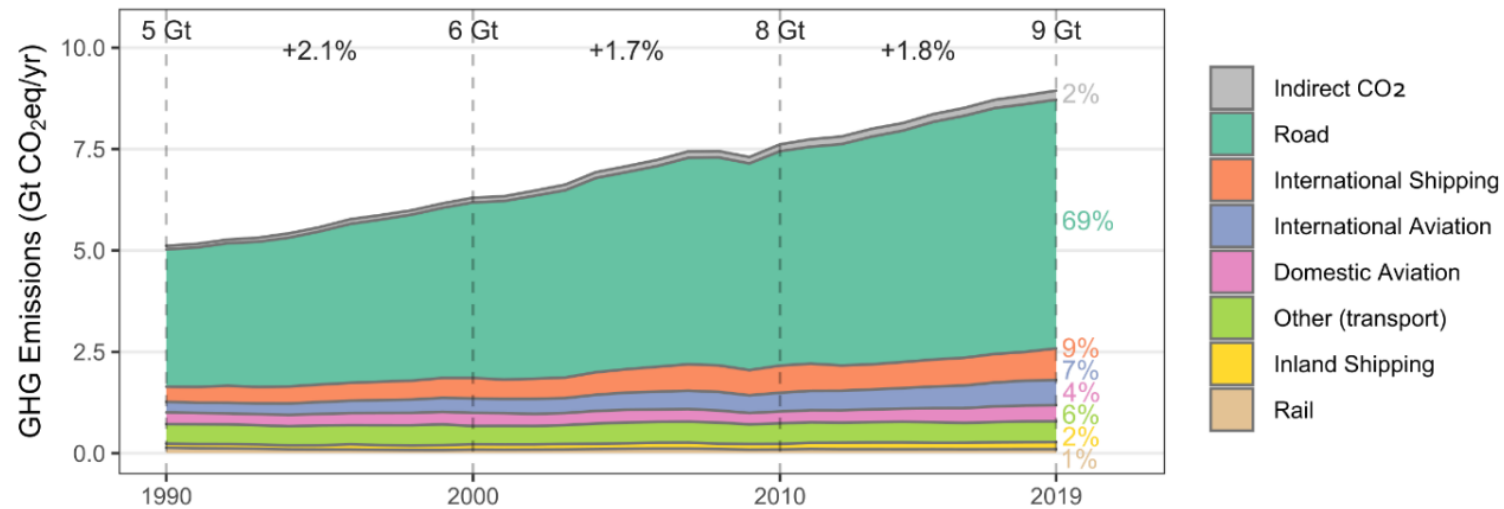
- 85% of today's emissions are from **energy** usage **19% of which is from transport**
 - **75% (Road), 13% Aviation, 11% Maritime, 1% Rail, <1% others**
- 30% more Capital spending (to \$9.2 trillion/yr) for the next 30 years to achieve net zero
 - Equivalent to half of the current annual corporate profits



Source: McKinsey (2022)



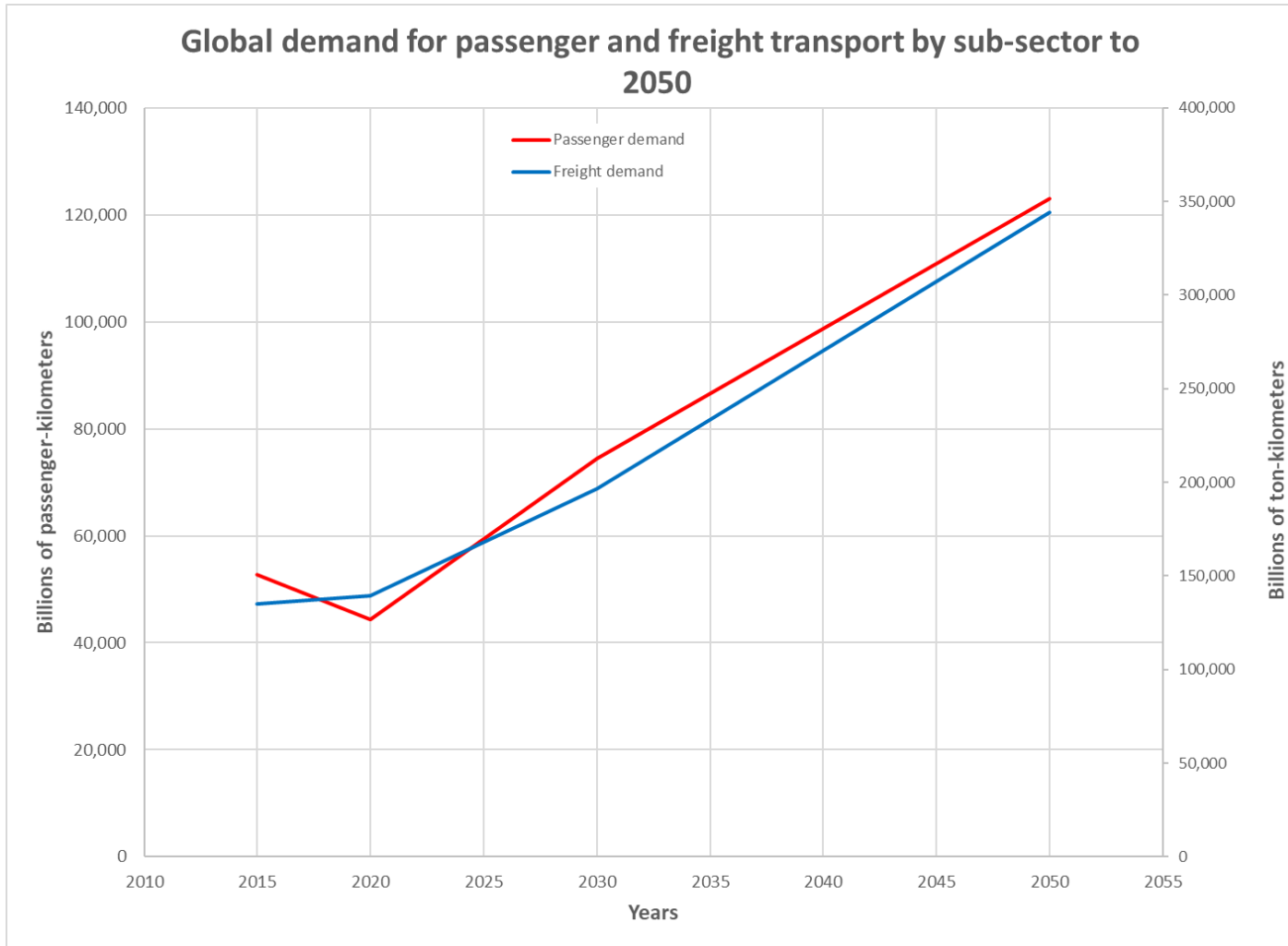
Road emissions rapidly growing in the last 3 decades



Transport and Climate Change Week

Which data are necessary for baseline development?

Passenger/freight demand is set to greatly increase



Source: ITF Transport Outlook 2021



Transport and Climate Change Week

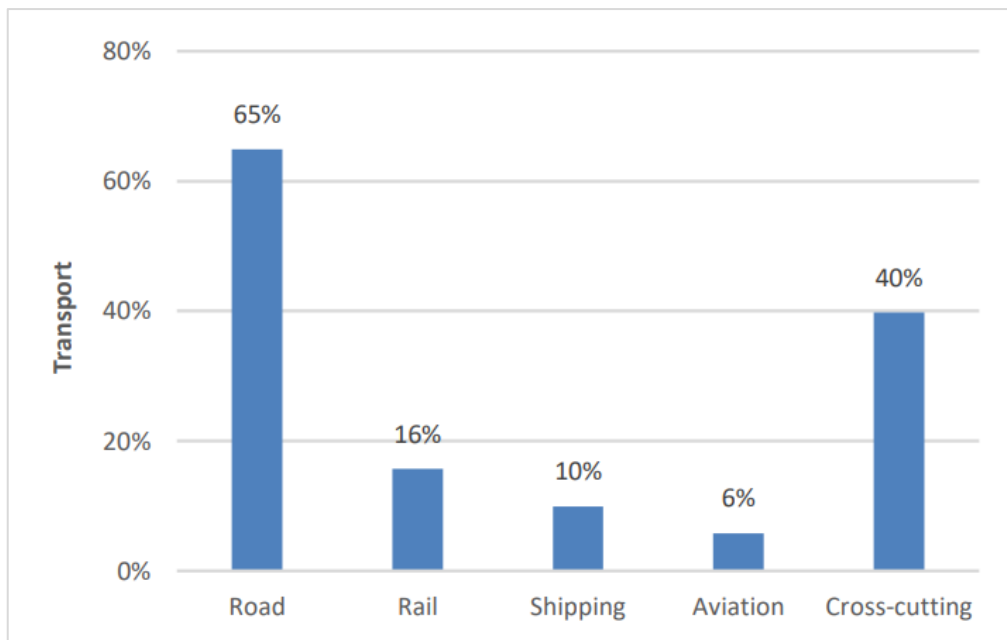
Which data are necessary for baseline development?

Transport sector climate action commenced but needs scale up

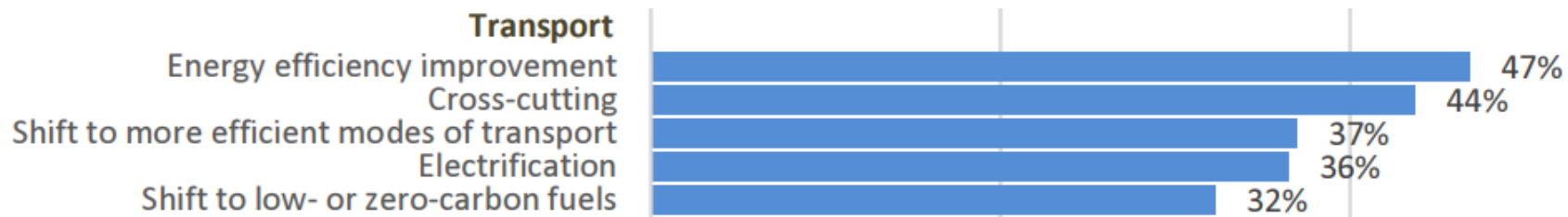
- a move to a net-zero economy resulted in \$400 billion in investment over the past decade
- governments and cities introduced regulations and incentives
- The EU proposed a target to cut avg CO2 emissions from new cars by 55% before 2030
- the US government called for zero-emission vehicles to make up half of all new passenger car and light-truck sales by 2030
- Several countries have also brought forward timelines for bans on sales of new vehicles with internal combustion engines (ICEs). Some provide subsidies for low-emission vehicles.



Transport Mitigation measures in NDCs



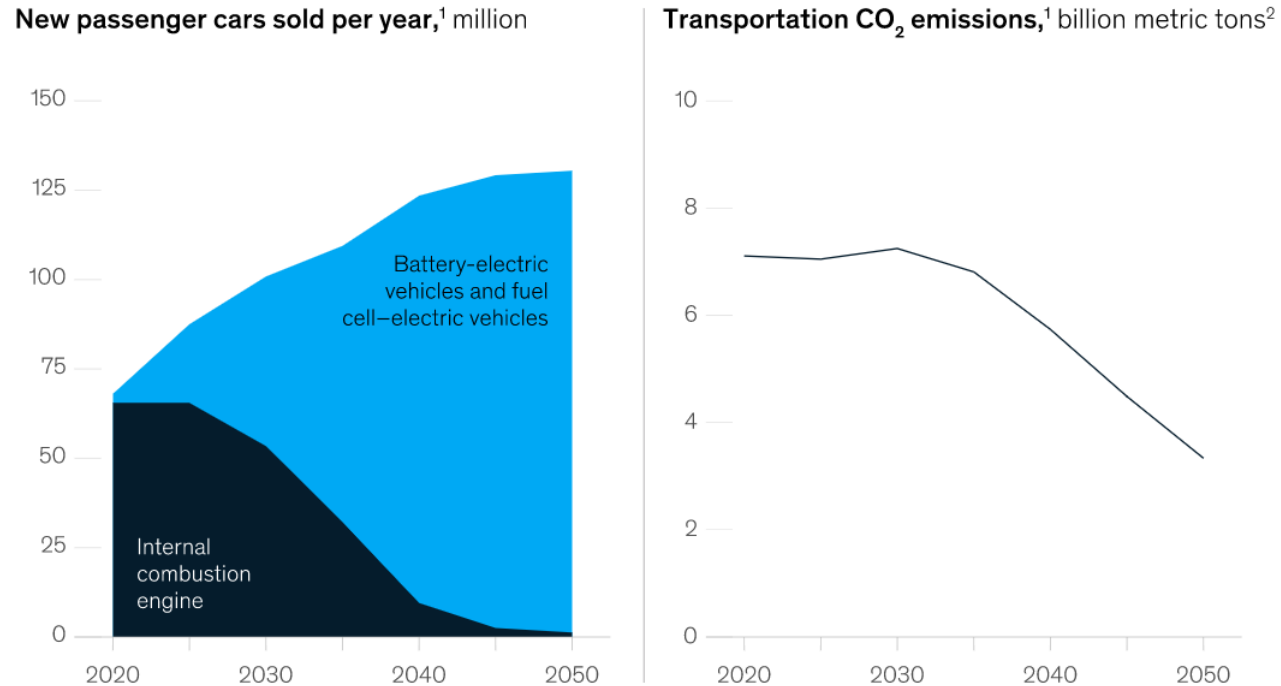
% of Parties referring to sub-areas



% of Parties referring to mitigation options



Transport emissions should dramatically drop for 2050 target



¹Based on the NGFS Net Zero 2050 scenario using REMIND-MAGPIE. In some instances, variables were downscaled by Vivid Economics. This represents global activity levels and emissions. In the Net Zero 2050 scenario, different systems reach zero emissions at different times.

²Includes road transportation, aviation, freight, and rail.

Source: NGFS Net Zero 2050 scenario using REMIND-MAGPIE (phase 2); Vivid Economics; McKinsey Sustainability Insights; McKinsey Global Institute analysis

Ref: Mobility's net-zero transition: A look at opportunities and risks, McKinsey, 2022



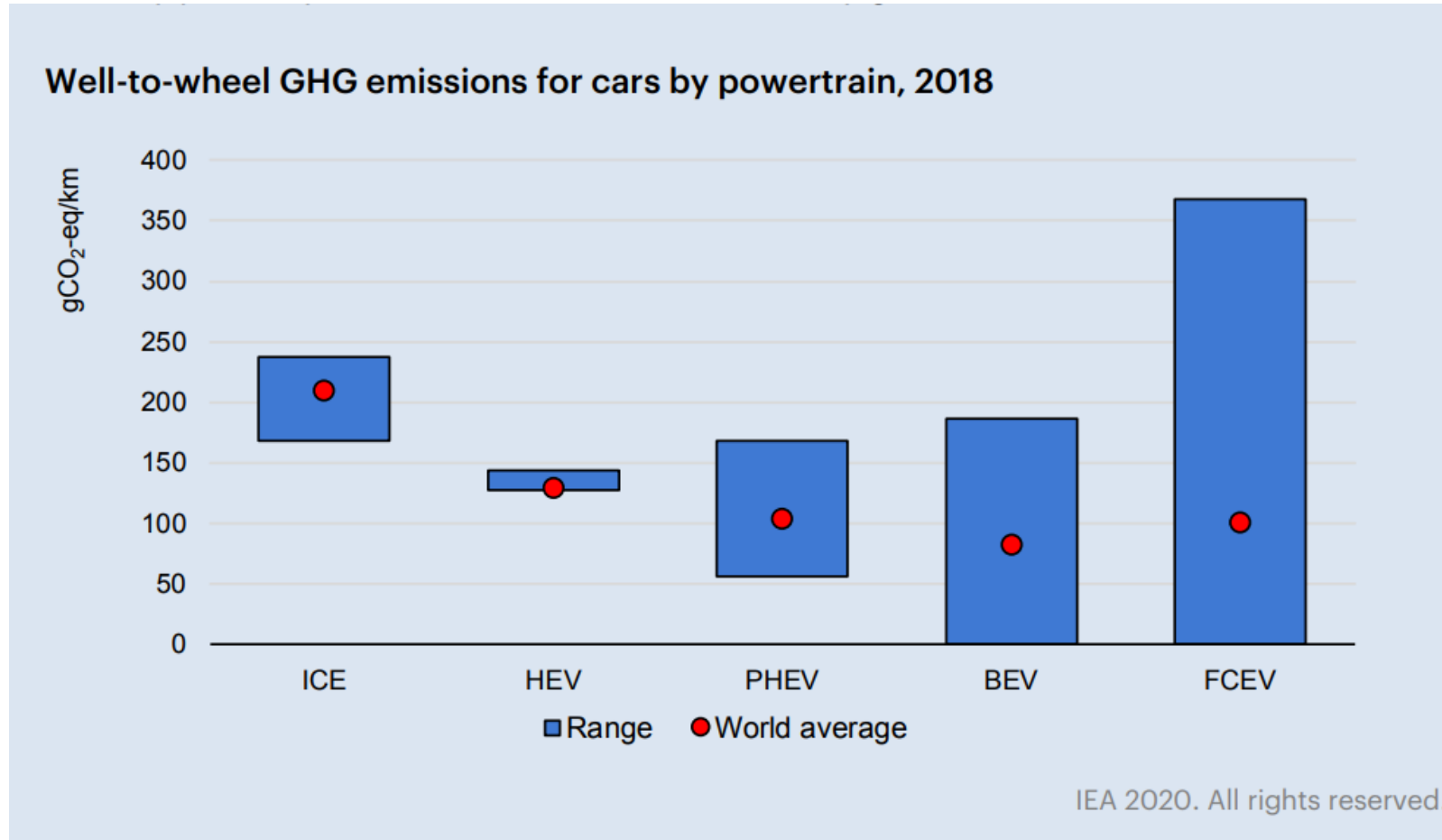
Transport and Climate Change Week

Which data are necessary for baseline development?

- Accounting GHG emissions on a life-cycle basis versus a well-to-wheel (WTW)
 - a) WTW comprise both well-to-tank (WTT) and tank-to-wheel (TTW) emissions
 - b) In the case of oil extraction, refining and distribution; For biofuels, growing feedstock, transforming and transporting it to the fuel pump; For electricity, generating electricity, transmission and charging the vehicle. In case of hydrogen, producing, transporting and dispensing the hydrogen to the vehicle. TTW (“tailpipe”) emissions come from the leakage of hydrocarbons in vehicle tanks and from fuel combustion. Therefore, TTW emissions are zero for electric vehicles and fuel cell vehicles
- Lifecycle assessment takes into account sourcing, altering and incorporating materials into the final product (i.e. the car, its engine and drivetrain, or battery and/or fuel cell), as well as from the end-of-life (i.e. disposal, reuse and/or recycling).



No one size fit all, region/technology specific issues are important



Ref: Global EV Outlook 2020, IEA



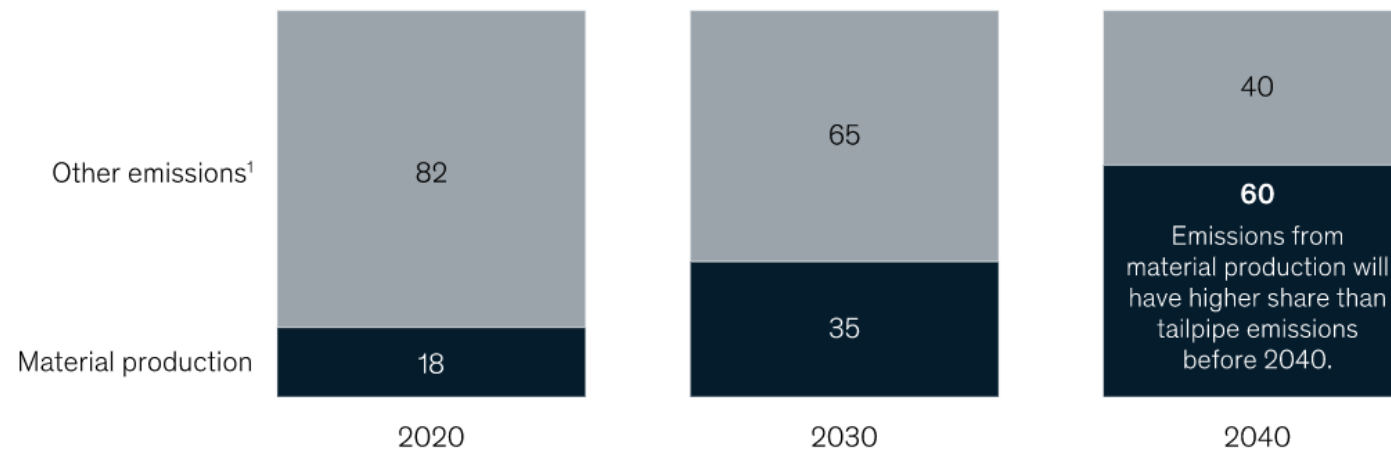
Transport and Climate Change Week

Which data are necessary for baseline development?

Material emissions make up for a major portion by 2040

Emissions from material production may reach 60 percent of life-cycle emissions by 2040.

% of life-cycle emissions, (based on required sales data)



Ref: The zero-carbon car: Abating material emissions is next on the agenda, McKinsey, 2020



Transport and Climate Change Week

Which data are necessary for baseline development?

Defining “baseline” is the most important first step

- Implementation of mitigation measures: compare how much GHG is being emitted **relative** to a situation/scenario where the measure would not be implemented;
- The baseline scenario shall be constructed based on reliable inputs that indicates with confidence what would have happened if a decision was not taken;



Calculating the baseline emissions and emission reductions



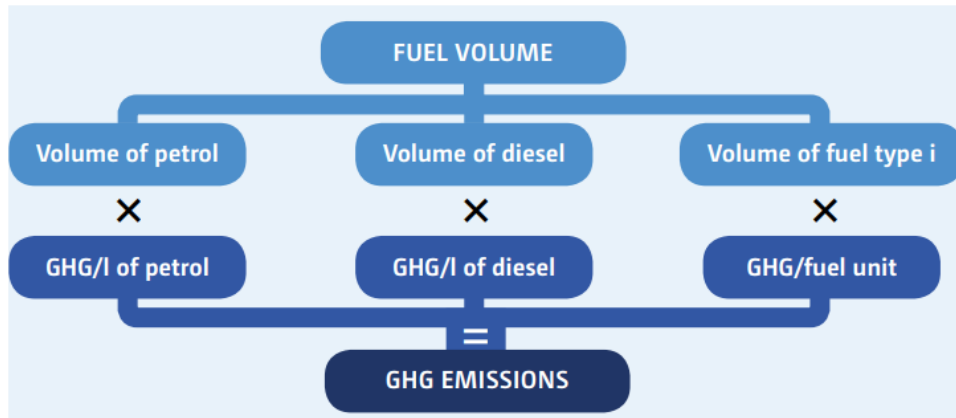
https://unfccc.int/sites/default/files/resource/Transport_0.pdf



Transport and Climate Change Week

Which data are necessary for baseline development?

Emissions in the Baseline and Project scenarios

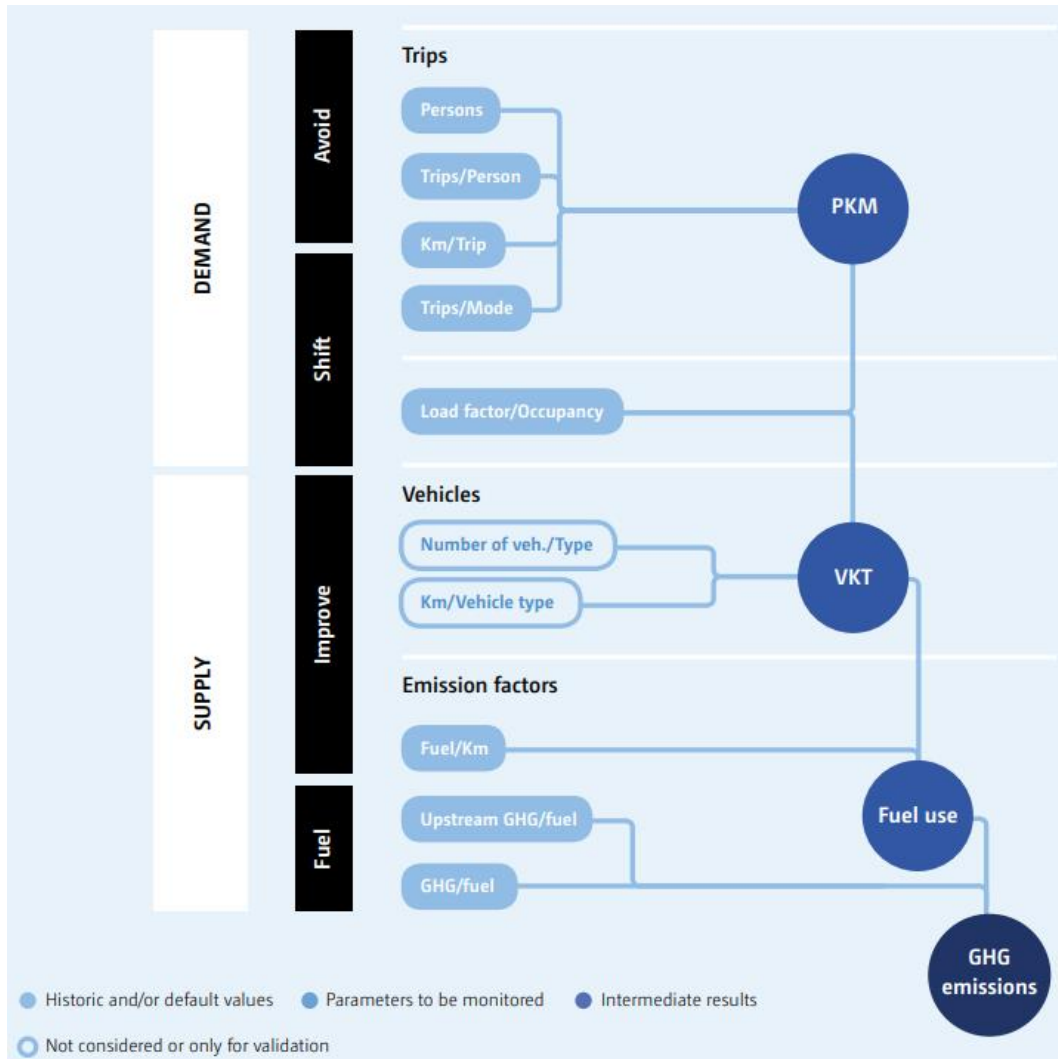


a) Top-down (Tier 1)

- Based on fuel consumed and properties of the fuel;
- Used for **inventories** or to calculate **actual emissions**;
- No disaggregations;



Emissions in the Baseline and Project scenarios



a) Top-down (Tier 1)

- Based on fuel consumed and properties of the fuel;
- Used for **inventories** or to calculate **actual emissions**;
 - No disaggregations;

b) Bottom-up (Tier 2)

- Based on trips;
- ASIF model:
 - **A**ctivity (km)
 - **S**hare by mode (%)
 - **I**ntensity of fuel (fuel/km)
 - **F**uel type (CO₂/fuel)



Thank you!

Gajanana Hegde

Team Leader - Energy Team

Phone +49 228 815 1388

Fax +49 228 815 1999

ghegde@unfccc.int

unfccc.int

Eduardo Cardoso Filho

Associate Programme Officer - Energy Team

Phone +49 228 815 1489

Fax +49 228 815 1999

ecardosofilho@unfccc.int

unfccc.int

UNFCCC Secretariat

Sustainable Development Mechanisms (SDM)

Regulatory and Development Unit (RDU)



BASELINE DEVELOPMENT FOR THE TRANSPORT SECTOR

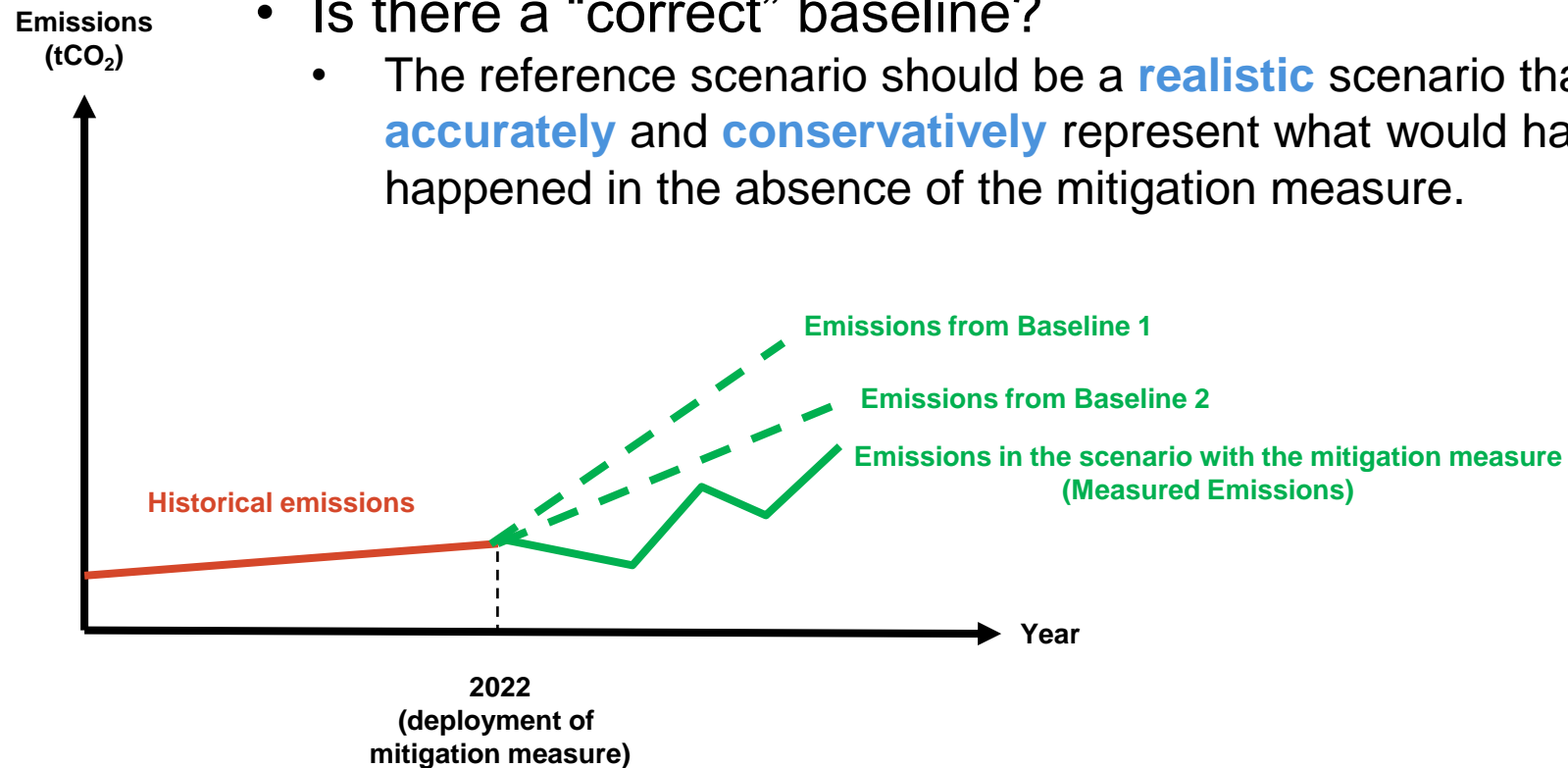
Hands-on exercise

Transport and Climate Change Week



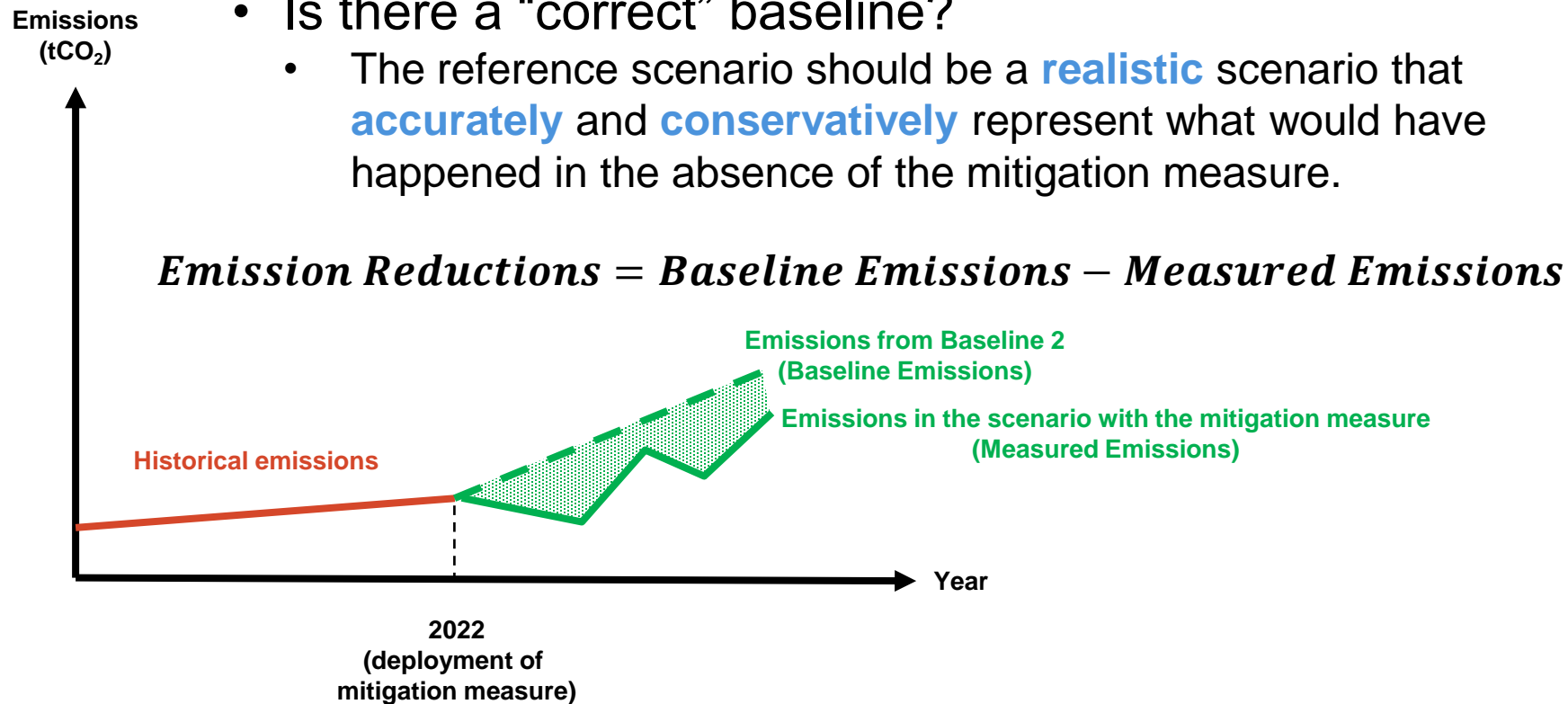
Defining “baseline”

- What is the difference between the baselines?
 - They were determined based on different inputs (population growth, higher/lower demand for a service, economic indicators, etc)
- Is there a “correct” baseline?
 - The reference scenario should be a **realistic** scenario that **accurately** and **conservatively** represent what would have happened in the absence of the mitigation measure.



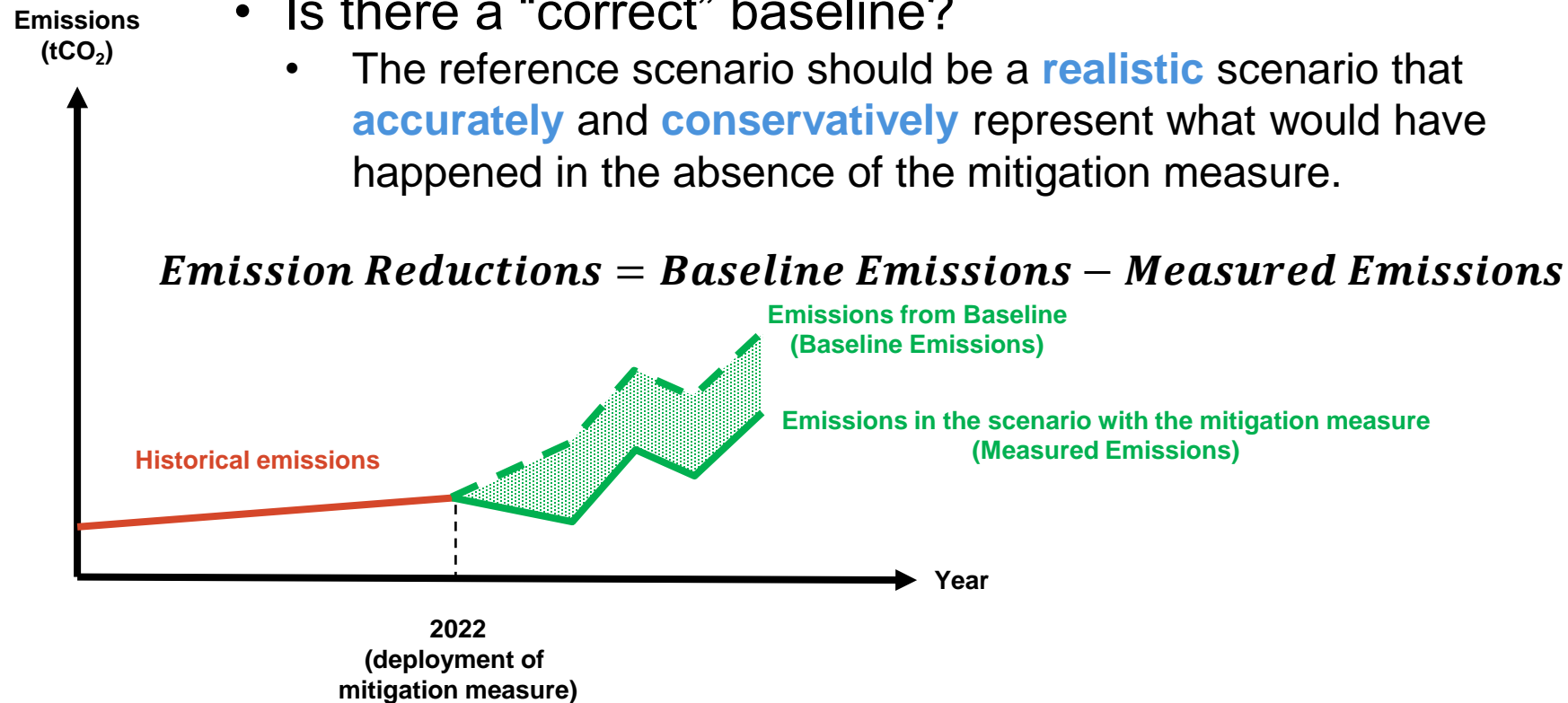
Defining “baseline”

- What is the difference between the baselines?
 - They were determined based on different inputs (population growth, higher/lower demand for a service, economic indicators, etc)
- Is there a “correct” baseline?
 - The reference scenario should be a **realistic** scenario that **accurately** and **conservatively** represent what would have happened in the absence of the mitigation measure.



Defining “baseline”

- What is the difference between the baselines?
 - They were determined based on different inputs (population growth, higher/lower demand for a service, economic indicators, etc)
- Is there a “correct” baseline?
 - The reference scenario should be a **realistic** scenario that **accurately** and **conservatively** represent what would have happened in the absence of the mitigation measure.



How to set the baseline?

- Simulation based on indicators;
 - e.g. economic growth, cost of fuel, populational growth;
 - Estimate the demand for public transport if the population grows 2%, or estimate the change in the modes of transport of the cost of the diesel decreases;
- Historical trends;
 - Continuation of the business-as-usual (BAU) practices;
 - Population would continue to travel under the same transport modes;
- Course of action
 - Adoption of specific strategies and policies (e.g. enforcement of standards or technologies)
 - Only sales of natural gas vehicles are allowed.
- Control group
 - Population with similar characteristics
 - Two cities with similar socio-economic conditions.



How to set the baseline? (cont)

- **Survey;**
 - Ask questions to determine travel behaviour;
 - Ask users of BRTs or subways how they would have travelled in the absence of the BRT or subway between the origin and the final destination;
- **Best available technology;**
 - The baseline is represented by best available technology in the region/country;
 - Use the fuel consumption of the most efficient vehicles (or top-x% most efficient vehicles);
- **Best-performing comparable activities;**
 - Use the average emission level of the best performing comparable activities;
 - Use the emission factor per passenger-kilometre of a BRT system from another city that has low emissions per passenger travelled;



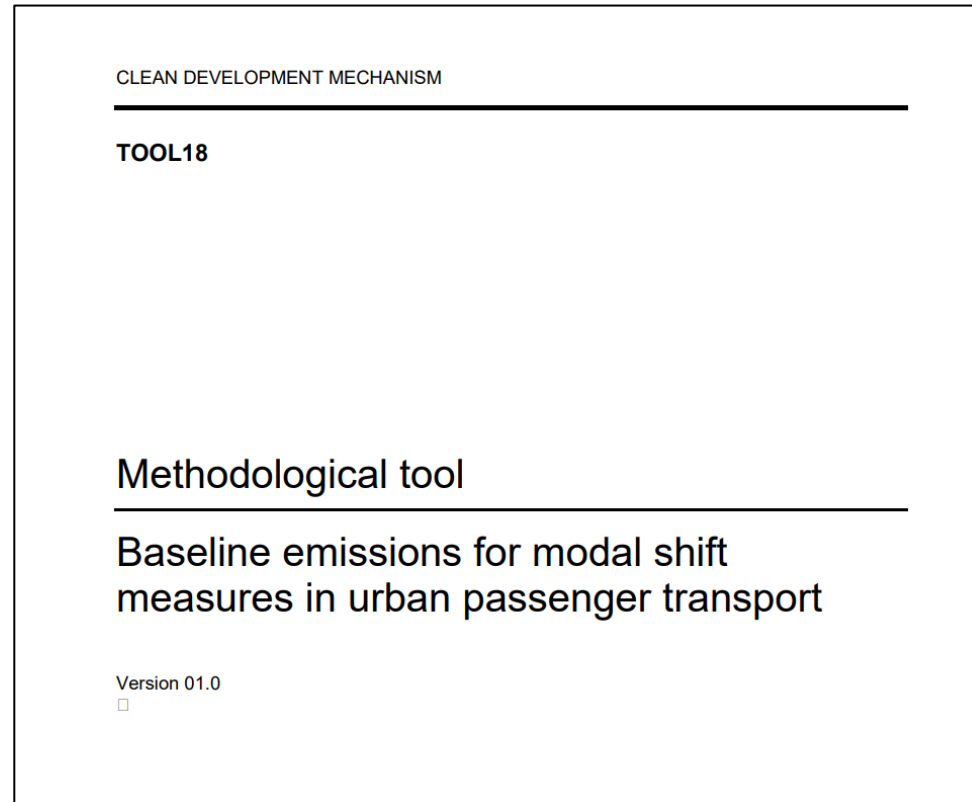
Calculating the baseline emissions

- **Survey;**
 - Ask questions to determine travel behaviour;
 - Ask users of BRTs or subways how they would have travelled in the absence of the BRT or subway between the origin and the final destination;



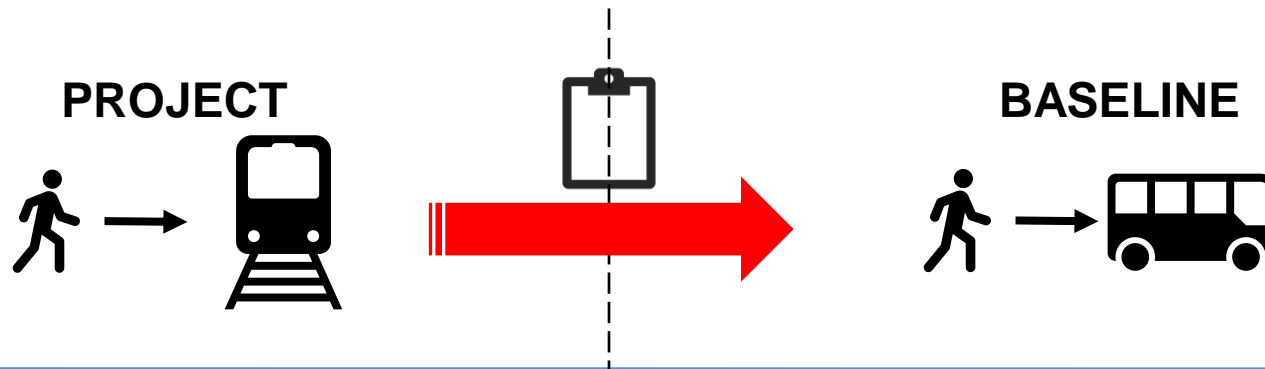
Example: construction of a new subway line

- A city wants to construct a new subway line.
 - What is the baseline?
 - How baseline emissions are calculated?



Example: construction of a new subway line

- A city wants to construct a new subway line.
 - What is the baseline?
 - How baseline emissions are calculated?
- TOOL18
 - **Baseline:** conduct **passenger survey** after this new subway line enters in operation to determine how the passenger would have travelled between the origin and final destination (e.g. which modes would have been used, the distance travelled) → **CO₂ emission factor per passenger-kilometer** for different transportation modes (e.g. bus, taxi, motorcycles);

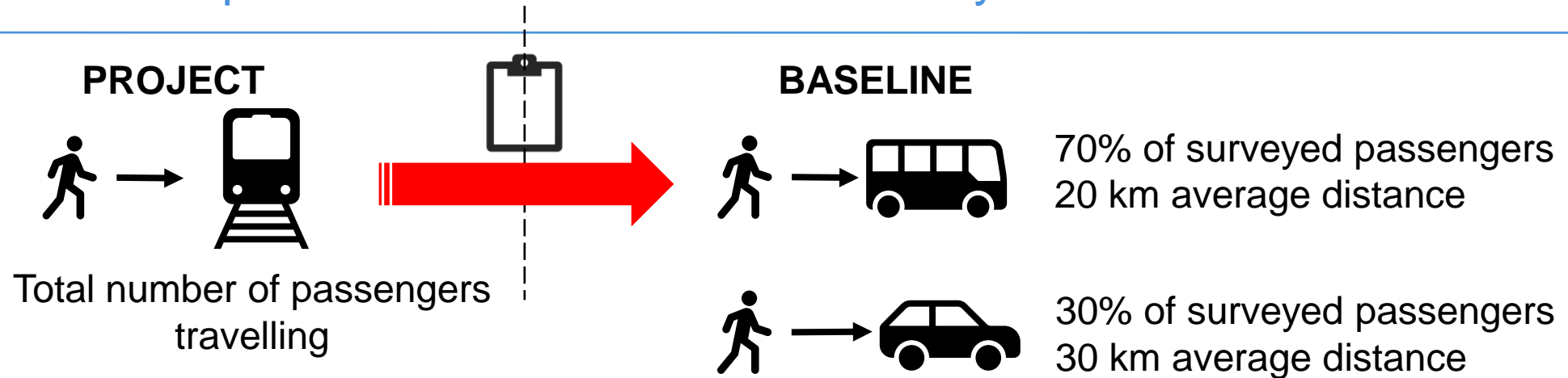


Example: construction of a new subway line

- A city wants to construct a new subway line.
 - What is the baseline?
 - How baseline emissions are calculated?
- TOOL18
 - **Baseline:** conduct **passenger survey** after this new subway line enters in operation to determine how the passenger would have travelled between the origin and final destination (e.g. which modes would have been used, the distance travelled) → **CO₂ emission factor per passenger-kilometer**. for different transportation modes (e.g. bus, taxi, motorcycles);
 - **Baseline emissions:** for each transportation mode, the product between the (i) **CO₂ emission factor per passenger-kilometer**, (ii) the **average distance travelled** by each passenger, (iii) **share of surveyed passengers** that would have used the baseline transportation mode and (iii) the number of **passengers that travelled** in the new subway line



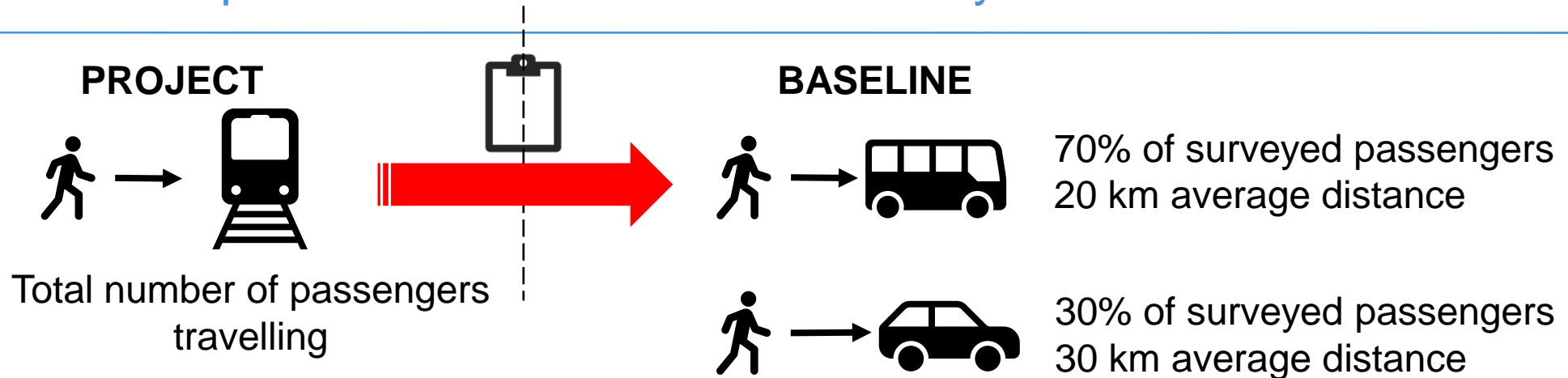
Example: construction of a new subway line



- **Baseline emissions:** for each transportation mode, the product between the (i) **CO₂ emission factor per passenger-kilometer**, (ii) the **average distance travelled** by each passenger, (iii) **share of surveyed passengers** that would have used the baseline transportation mode and (iii) the number of **passengers that travelled** in the new subway line



Example: construction of a new subway line

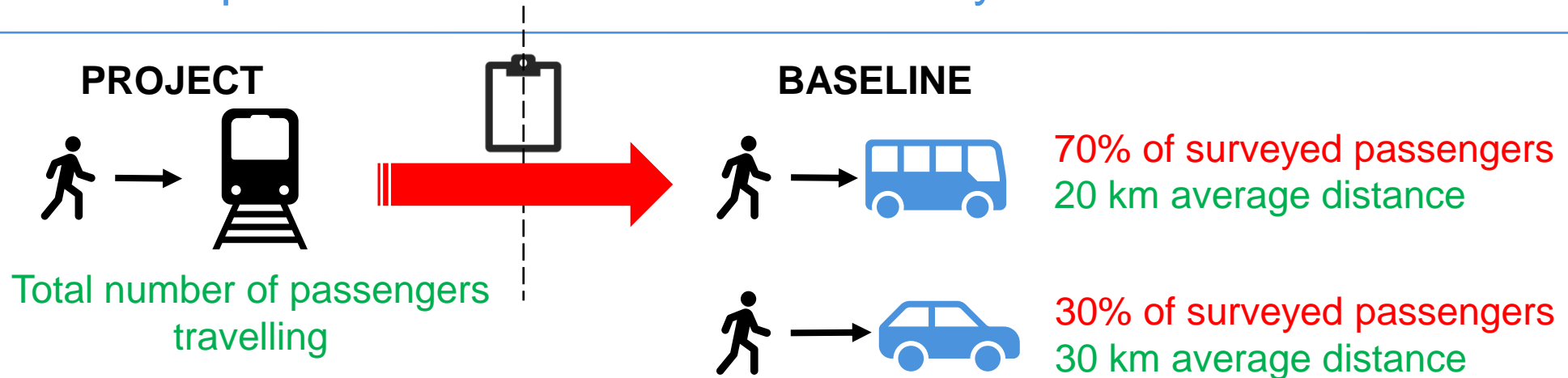


$$\text{GHG Emissions} = A \times S \times I \times F$$

- **A** Activity (pkm)
 - **S** Share by mode (%)
 - **I** Intensity of fuel (fuel/km)
 - **F** Fuel type (gCO₂/fuel)
- **Baseline emissions:** for each transportation mode, the product between the (i) **CO₂ emission factor per passenger-kilometer**, (ii) the **average distance travelled** by each passenger, (iii) **share of surveyed passengers** that would have used the baseline transportation mode and (iii) the number of **passengers that travelled** in the new subway line



Example: construction of a new subway line



$$\text{GHG Emissions} = A \times S \times I \times F$$

- **A** Activity (pkm)
 - **S** Share by mode (%)
 - **I** Intensity of fuel (fuel/km)
 - **F** Fuel type (gCO₂/fuel)
- **Baseline emissions:** for each transportation mode, the product between the (i) **CO₂ emission factor per passenger-kilometer**, (ii) the **average distance travelled** by each passenger, (iii) **share of surveyed passengers** that would have used the baseline transportation mode and (iii) the number of **passengers that travelled** in the new subway line



Hands-on exercise

- A MDB wants to invest in a new BRT line and would like to determine the emission reductions to include in its portfolio. As an expert in the transport sector, you were hired by the MDB to determine the baseline emissions.
- To undertake this task, you decided that a survey will be needed to determine the baseline emissions. Now you have to:
- Elaborate which **questions would need to be asked** to passengers;
- Identify which **parameters don't need to be captured** by the survey and **how they would be determined**;
- Discuss some **criteria and conditions to conduct the survey** in order to interview a representative sample of passengers;
- Calculate the baseline emissions using the ASIF model and the results of the survey.

