Refinement of transport pathways in the Sector Decarbonization Approach

Methodological Choices

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Science Based Targets initiative

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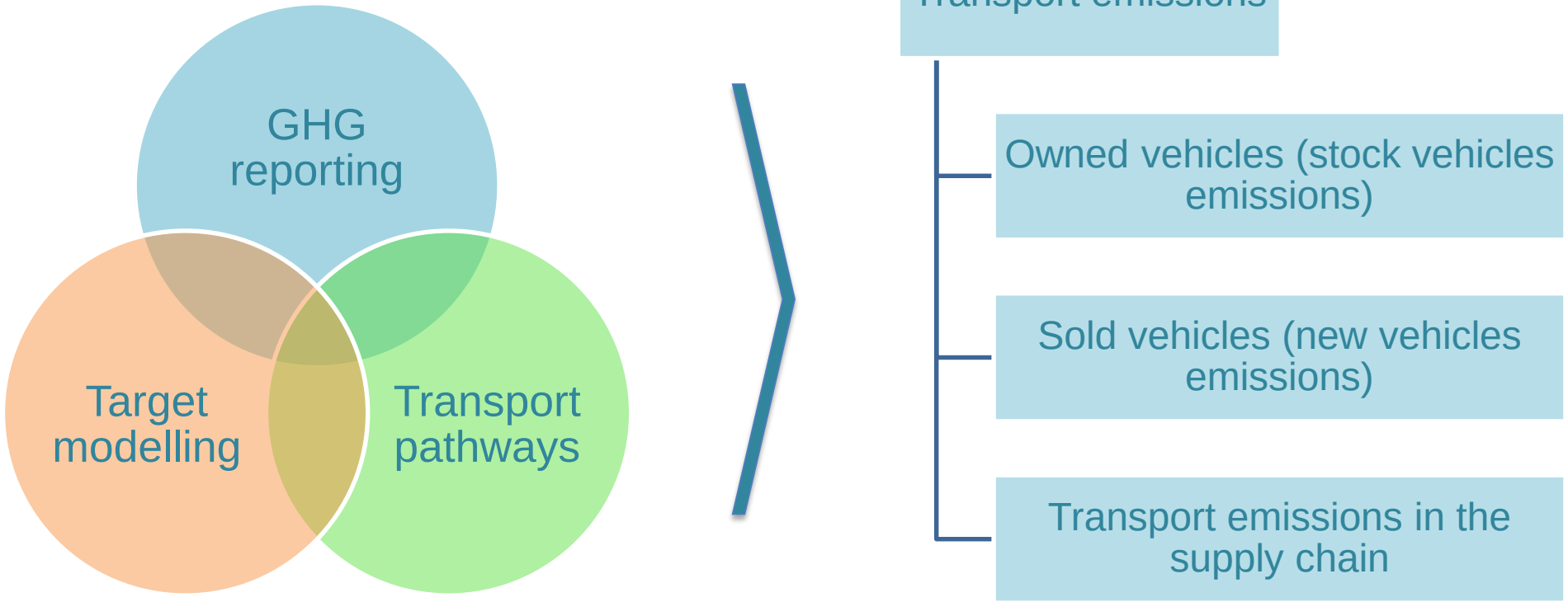
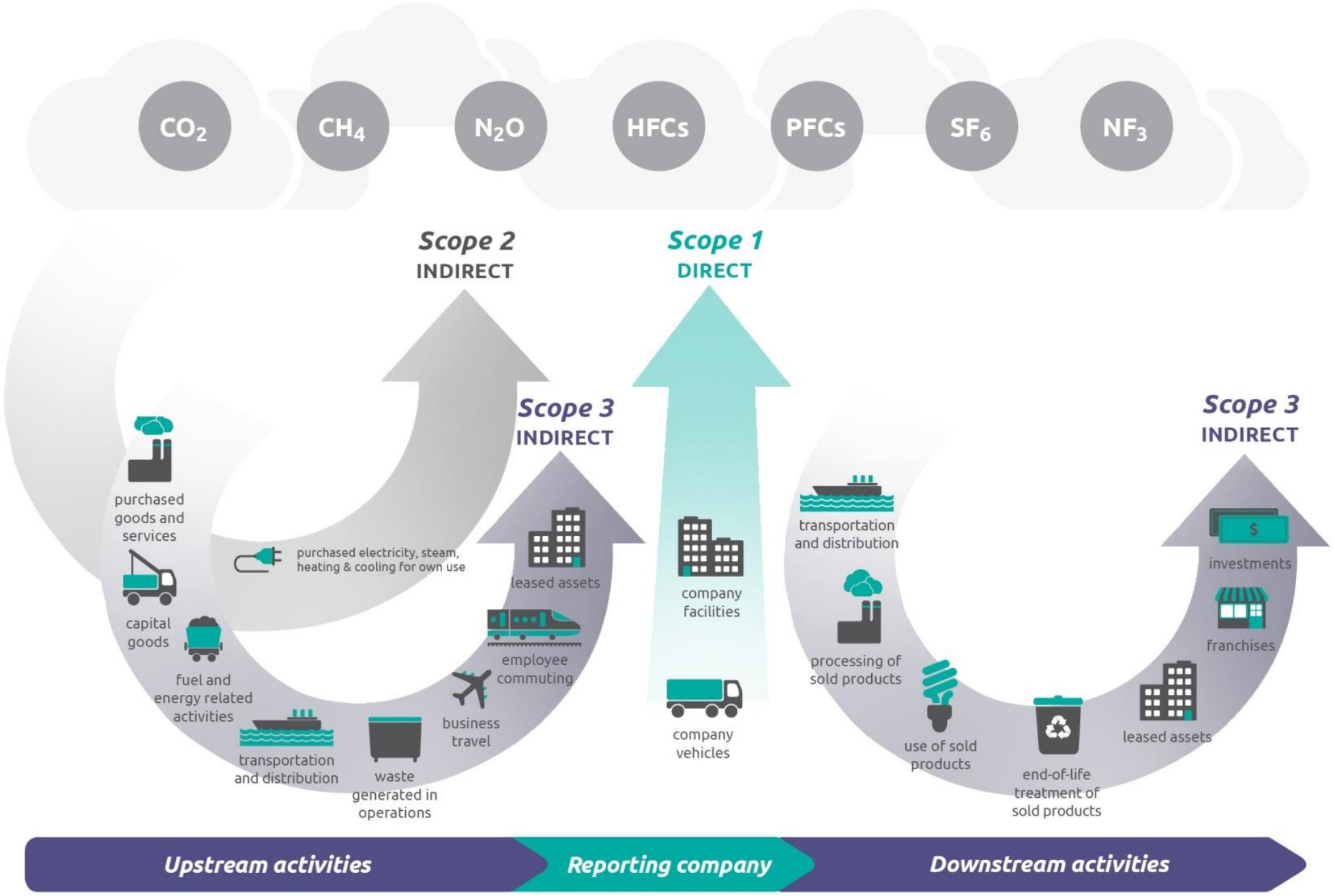
Refinement of transport pathways in the Sectoral Decarbonization Approach

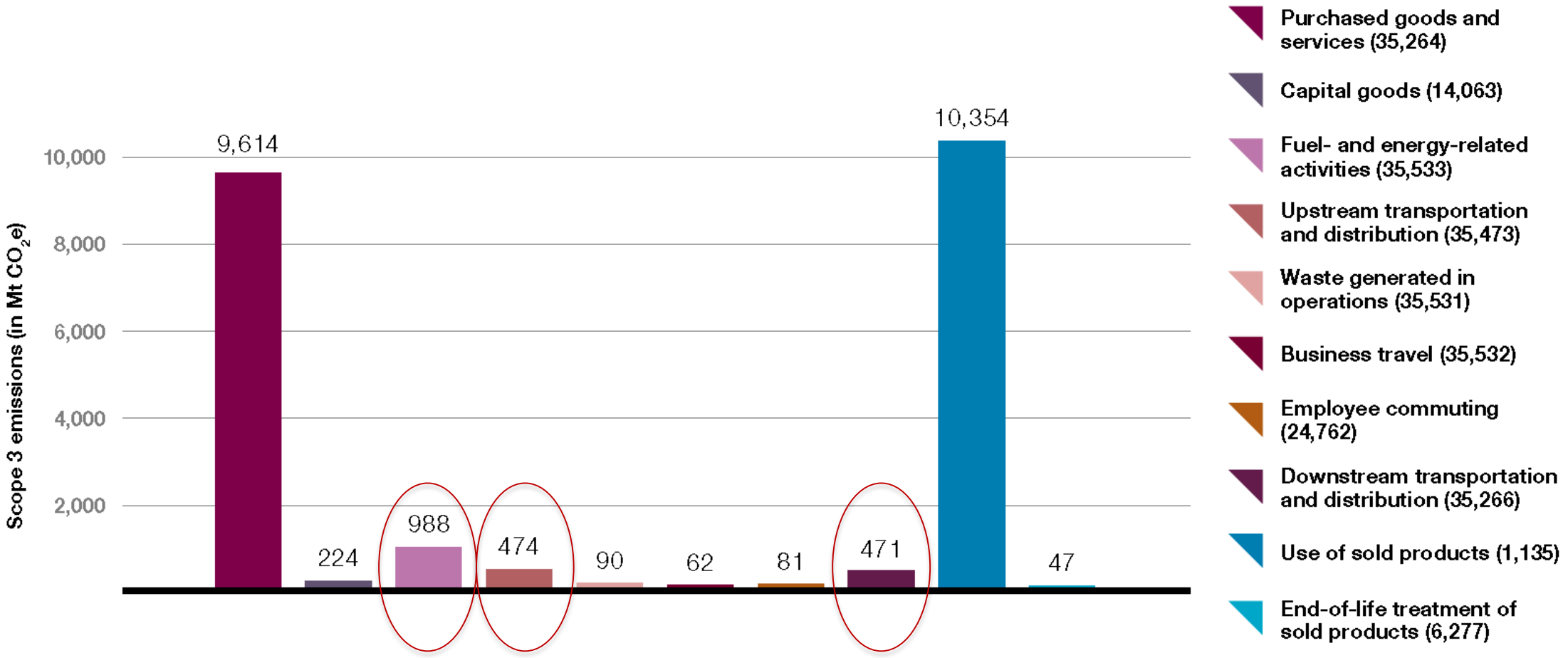
1. Background
2. Methodological choices
3. SDA tool preview

The core concept of this project is to address the need for target setting tools and guidance that cover transport emissions across different types of stakeholders, taking into account GHG reporting practices and the decarbonization pathway they need to converge to




CO_2
CH_4
N_2O
HFCs
PFCs
SF_6
NF_3
Scope 2
INDIRECT
Scope 1
DIRECT
Scope 3
INDIRECT
Scope 3
INDIRECT
purchased goods and services
capital goods
fuel and energy related activities
transportation and distribution
waste generated in operations
business travel
employee commuting
leased assets
purchased electricity, steam, heating & cooling for own use
company facilities
company vehicles
transportation and distribution
processing of sold products
use of sold products
end-of-life treatment of sold products
leased assets
franchises
investments
Upstream activities
Reporting company
Downstream activities

Relevant scope 3 categories



- Selection of transport modeling scenario: IEA MoMo
- Target-setting under a B2DS
- Transport modes and vehicle categories
- Convergence to global decarbonization pathways
- Target boundary: WTT, TTW and WTW emissions / CO2 and CO2e emissions
- Accounting of electricity emissions of electric vehicles
- Boundary: Idling and empty running
- Data Quality: Real emissions vs test procedure emissions (mostly applicable to vehicle manufacturers) / Actual vs Default factors
- Calculating air freight emissions

Selection of transport modeling scenario: IEA MoMo

Model name	Organization	Scope	Public	2DS	B2DS
MoMo model / ETP 2016	International Energy Agency	All modalities	No	Yes	Yes
International Transport Outlook	International Transport Forum (ITF)	All modalities	Yes	No	No
Global Transport Roadmap Model	International Council for Clean Transportation (ICCT)	All modalities	Yes	No	No

Source: Ecofys

Why use MoMo?

- Compatibility with IEA ETP sectoral budgets (basis for SDA tool)
- Availability of both B2DS and 2DS scenarios
- Its mitigation levers are transparent; and
- It covers both passenger and freight transport

Target-setting under a B2DS

The SBTi partners have agreed to move from 2DS to B2DS target-setting to raise the level of ambition to be recognized by the SBTi. This means that in the future all targets that are submitted to the initiative will be validated against B2DS (i.e. all sectors covered by the SDA, including transport).

This entails setting more ambitious targets than those derived using the IPCC RCP 2.6 and IEA 2DS that methods to date rely on. Exceeding the requirements of a 2°C scenario will provide essential first steps to “pursue efforts to limit the temperature increase to 1.5°C.”

Considering that both the 2DS and B2DS scenarios involve the same information companies need to set targets and involve similar technological feasibilities, companies should take action now on raising ambition beyond the 2°C minimum. Delaying action on increasing ambition beyond 2°C is detrimental to averting the worst impacts from climate change.

Target-setting under a B2DS

Paris Agreement Article 2

1. The Paris Agreement aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by:

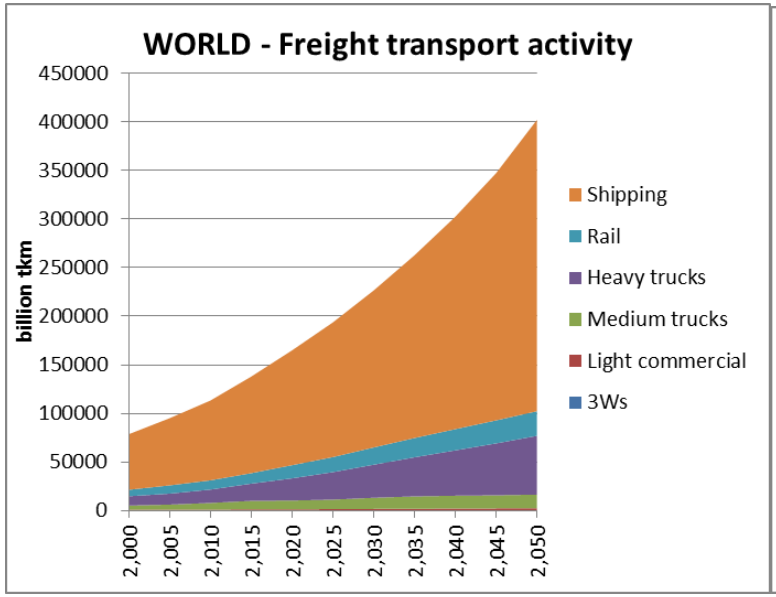
"(a) Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change […]

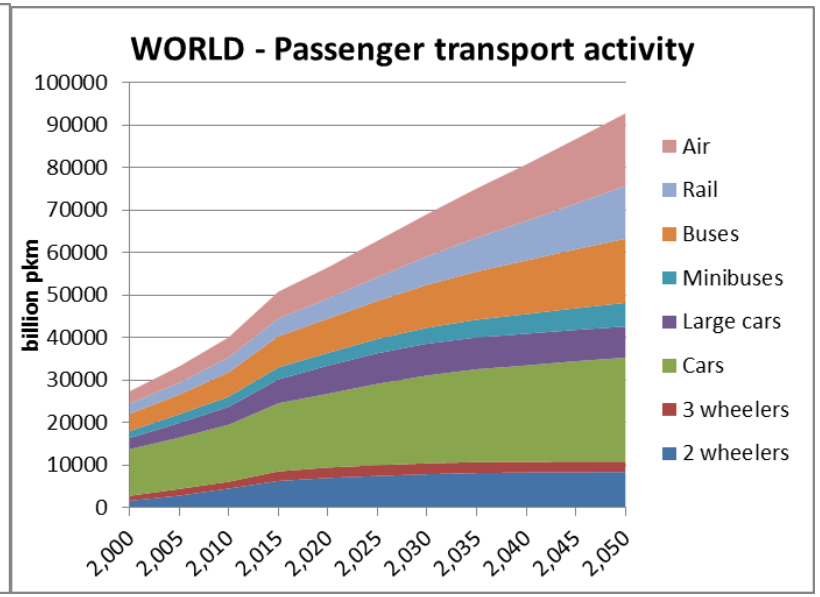
Paris Agreement Article 4

1. In order to achieve the long-term temperature goal set out in Article 2, Parties aim to reach global peaking of greenhouse gas emissions as soon as possible […]

Transport modes and vehicle categories

Freight transport categories	Passenger transport categories
Total (all categories)	Total (all categories)
2-3 Wheelers	2-3 Wheelers
Light commercial vehicles	Light passenger vehicles
Large road (MFT, HTF)	Large road (Buses, mini buses)
Rail	Rail
Air	Air
Shipping	N/A





Convergence to global decarbonization pathways

The SDA transport tool will model targets aligned with global carbon intensities per transport category, with no regional focus, since:

a) **technologies tend to normalize over time and**

b) **it is applicable to multinational companies operating in different markets**

Regional differences will be discussed in deliverable 2, “Technical Paper” describing what is behind the model (assumptions, growth projections, levers of decarbonization).

Target boundary: WTT, TTW and WTW emissions / CO2 and CO2e emissions

The emissions from the use of a vehicle consist of well-to-tank (WTT) emissions and tank-to-wheel (TTW) emissions. WTT emissions occur upstream in the value chain of the fuel production, for example during the extraction and processing of diesel or petrol. TTW emissions occur during the combustion of the fuel during the use of the vehicle. Together these form the well-to-wheel (WTW) emissions.

All companies should report WTT and TTW emissions in accordance with the GHG Protocol and the GLEC Framework.

The SBTi encourages companies to use CO2e for target setting. GHG exclusions are allowable if less than 5% of the combined scope 1 and 2 emissions.

Transport project | Methodological choices

Owned vehicles					
		Reporting requirements	Vehicle electrification	Target-setting	
				Passenger	Freight
Road transport (LDV, HDV)	TTW	Scope 1 emissions Scope 2 emissions	Accounted for in Scope 2 emissions	Passenger TTW intensity pathway (LDV, HDV)	Freight TTW intensity pathway (LDV, HDV)
	WTT	Scope 3 category 3 Fuel and energy related activities emissions	N/A	Passenger WTT intensity pathway (LDV, HDV)	Freight WTT intensity pathway (LDV, HDV)
Rail transport	TTW	Scope 1 emissions Scope 2 emissions	Accounted for in Scope 2 emissions	Passenger TTW intensity pathway (Rail)	Freight TTW intensity pathway (Rail)
	WTT	Scope 3 category 3 Fuel and energy related activities emissions	N/A	Passenger WTT intensity pathway (Rail)	Freight WTT intensity pathway (Rail)
Air transport	TTW	Scope 1 emissions	N/A	Passenger TTW intensity pathway (Aviation)	Freight TTW intensity pathway (Aviation)
	WTT	Scope 3 category 3 Fuel and energy related activities emissions	N/A	Passenger WTT intensity pathway (Aviation)	Freight WTT intensity pathway (Aviation)
Maritime transport	TTW	Scope 1 emissions	N/A	Absolute reduction as per "Other transport"	
	WTT	Scope 3 category 3 Fuel and energy related activities emissions	N/A	Absolute reduction as per "Other transport"	

Transport project I Methodological choices

Sold vehicles					
		Reporting requirements	**Vehicle electrification**	**Target-setting**	
				Passenger	**Freight**
Road transport (LDV, HDV)	TTW	Scope 3 category 11 Product use emissions (WTT+TTW+Scope 2 emissions)	Accounted for in Scope 3 emissions	Passenger WTW intensity pathway for new vehicles (LDV, HDV)	Passenger WTW intensity pathway for new vehicles (LDV, HDV)
	WTT				
Rail transport	TTW	Scope 3 category 11 Product use emissions (WTT+TTW+Scope 2 emissions)	Accounted for in Scope 3 emissions	Not available	Not available
	WTT				
Air transport	TTW	Scope 3 category 11 Product use emissions (WTT+TTW)	N/A	Pathway not available	Pathway not available
	WTT				
Maritime transport	TTW	Scope 3 category 11 Product use emissions (WTT+TTW)	N/A	Pathway not available	Pathway not available
	WTT				

Transport project I Methodological choices

Transport supply chain emissions					
		Reporting requirements			Target-setting
		Passenger	Freight	Vehicle electrification	
Road transport (LDV, HDV)	TTW	Scope 3 category 6 Business travel emissions Scope 3 category 7 Employee commuting emissions	Scope 3 category 4 and 9 Upstream/Downstream transportation and distribution	Accounted for in Scope 3 emissions	**Question:** Absolute reduction OR TTW intensity pathway (LDV, HDV)
	WTT	N/A	N/A	N/A	N/A
Rail transport	TTW	Scope 3 category 6 Business travel emissions Scope 3 category 7 Employee commuting emissions	Scope 3 category 4 and 9 Upstream/Downstream transportation and distribution	Accounted for in Scope 3 emissions	**Question:** Absolute reduction OR TTW intensity pathway (Rail)
	WTT	N/A	N/A	N/A	N/A
Air transport	TTW	Scope 3 category 6 Business travel emissions	Scope 3 category 4 and 9 Upstream/Downstream transportation and distribution	N/A	**Question:** Absolute reduction OR TTW intensity pathway (Air passenger only)
	WTT	N/A	N/A	N/A	N/A
Maritime transport	TTW	Scope 3 category 6 Business travel emissions	Scope 3 category 4 and 9 Upstream/Downstream transportation and distribution	N/A	Absolute reduction
	WTT	N/A	N/A	N/A	N/A

Accounting of electricity emissions of electric vehicles

Vehicle owners

Account for emissions related to electricity generation (i.e. World's power sector decarbonization pathway) for the electricity used per transport mode. These scope 2 emissions are added to the TTW (direct emissions) to calculate a combined carbon intensity metric in gCO2e/p.km or t.km per transport mode/vehicle category.

Vehicle manufacturers

Account for emissions related to electricity generation (i.e. World's power sector decarbonization pathway) for the electricity used over the product use phase of a vehicle. These scope 2 emissions are added to the WTT (upstream emissions) and TTW (direct emissions) over the estimated product use phase of any applicable vehicle category to calculate a combined carbon intensity metric in gCO2e/v.km.

Boundary: Idling and empty running

All emissions related to the operation of vehicles should be included in the carbon intensity of the company. This includes the emissions from idling, repositioning and empty running. These emissions should also be included in the targets setting process.

Calculating air freight emissions

- MoMo does not contain the activity or emission levels for air freight transport.
- The emissions of air freight which is shipped on passenger aircraft is included in the air passenger emissions.
- Emissions of dedicated freight planes are not modelled. However, IATA has historical data on activities, but no projections.
- Conclusion: We will need to develop an approach for a 2°C trajectory for air freight.

Calculating air freight emissions

- An approach for **combined air freight and passenger transport** by estimating the share of activity and emissions for freight in comercial flights.

- An approach for **dedicated air freight transport** by assuming that the efficiency of comercial flights is the same for dedicated air freight transport.

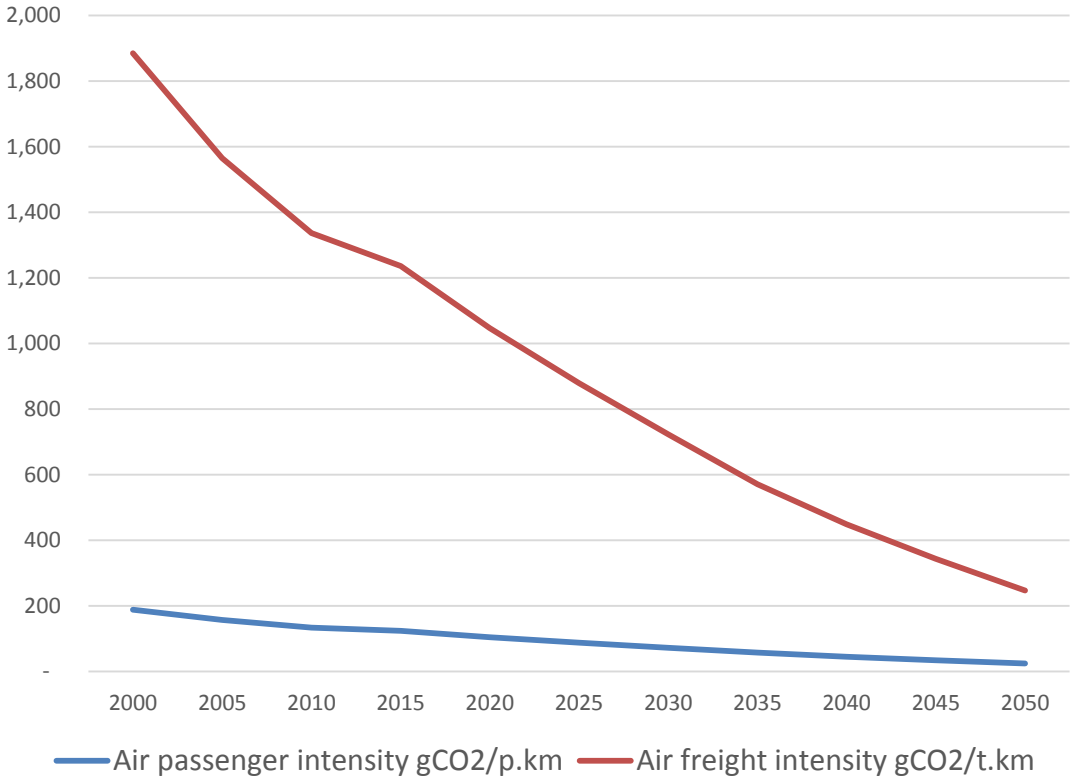
Calculating air freight emissions

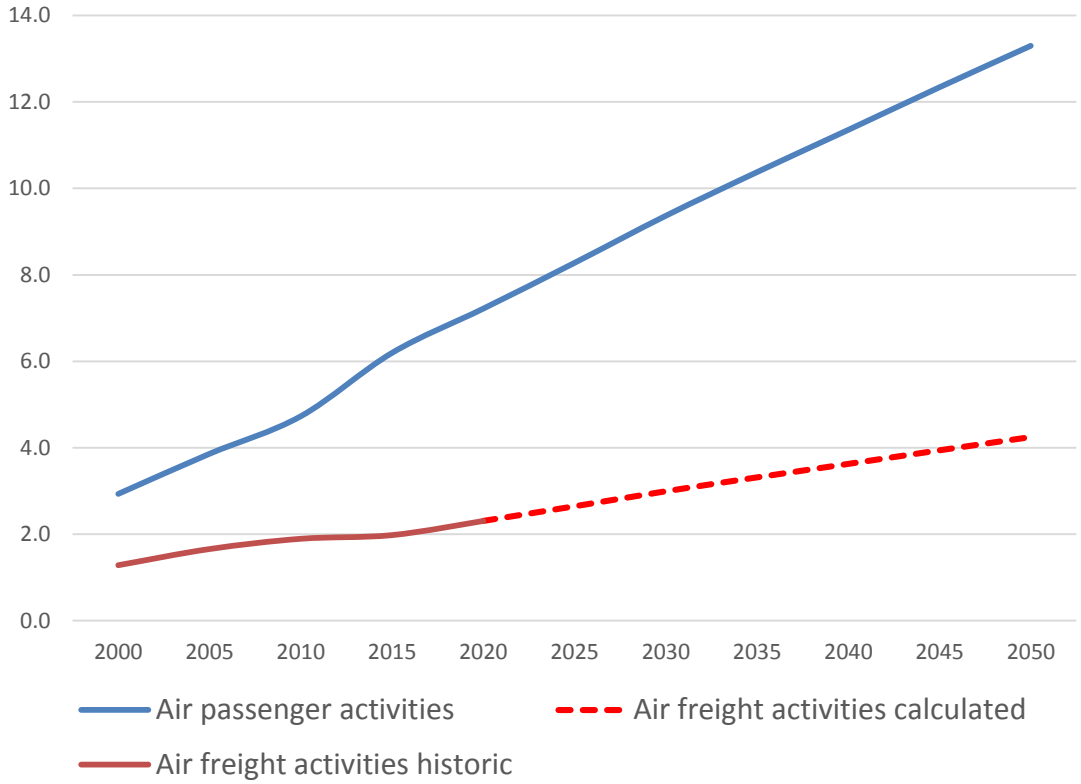
Approach for commercial flights (passenger & freight)

- To calculate the intensity of air freight transport sector ($kgCO_2$/t.km), the proposed approach is to divide the emissions from air freight transport ($MtCO_2e$) by the activities from air freight transport (billion t.km).
- In the MoMo, the emissions from air freight transport are included in the emissions for air passenger transport. Thus, emissions for air freight transport must be estimated using the percentage of air freight transport emissions in air passenger transport emissions.
- This percentage is calculated by dividing the air freight activities expressed in passenger kilometres by the sum of this value and the air passenger activities in passenger kilometres.
- The expression of air freight activities in passenger kilometres can be done by:
  - Using a ratio of **0.1 t.km per p.km** EU ETS/EN16258 (e.g. used by DPDHL)
  - Or using a ratio of **0.15 t.km per p.km** IATA, recommended practice 1678
- This percentage is calculated for the years 2000 to 2015. For 2020 until 2050, the approach assumes the average percentage from 2000 until 2015 as constant.

Calculating air freight emissions

Approach 1: Commercial flights (passenger & freight)





Data Quality: Real emissions vs test procedure emissions (mostly applicable to vehicle manufacturers) / Actual vs Default factors

The B2DS scenario that is underlying the SDA and the detailed transport pathways is based on projected carbon budgets for different economic sectors. To set science-based targets and stay within the carbon budget, all companies must report emissions and set targets based on actual emissions and not on estimated emissions using test procedure emission factors.

Companies should use data that are most representative of actual fuel consumption. Default data are acceptable, but they are less accurate and limit a Company's ability to track performance. Companies should collect high quality ('primary') data from suppliers and other value chain partners for scope 3 activities deemed most relevant and targeted for GHG reductions.

Data Quality: Real emissions vs test procedure emissions (mostly applicable to vehicle manufacturers) / Actual vs Default factors

Resources:

- **Chapter 7 of the GHG Protocol Scope 3 Standard provides further guidance on data quality issues;**
- **GLEC Framework offers additional details for freight transport.**

SDA target-setting tool for transport

Inputs:

- Scope 1 emissions (base year)
- Scope 2 emissions (base year)
- Activity (base year and target year)

Outputs:

- Scope 1 emissions (target year)
- Scope 2 emissions (target year)
- Emission reductions %
- Scope 1 intensity (target year)
- Scope 2 intensity (target year)
- Combined intensity reduction (target year)

SBT tool test

Thank you

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