Refinement of transport pathways in the Sectoral Decarbonization Approach

Summary of consultation on methodological choices

SUMMARY OF METHODOLOGICAL CHOICES

Key methodological choices for the transport refinement project have been discussed extensively in the past months with various industry and non-industry representatives. This consultation process included the following activities:

The participation of different types of transport related stakeholders has been instrumental in adding clarity and robustness to the project. Sections below summarize the proposed approaches, discussions and conclusions drawn by the project team from the different contributions gathered over the past 4 months.

1. Selection of transport modeling scenario: IEA MoMo

The IEA Mobility Model (MoMo) was pre-selected as the modeling scenario due to the following:

- *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*

The models assessed were:

Leading models	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

Survey question: The International Energy Agency Mobility Model (IEA MoMo) will be the basis for building decarbonization pathways in the SDA transport tool. Is the selection of the IEA MoMo as the transport modeling scenario clear and sufficiently justified?

Feedback received during consultation:	In general, survey respondents / consultees were not familiar with the MoMo, or they accepted it as the best option available.
Conclusions/ Decision(s):	The International Energy Agency Mobility Model (IEA MoMo) will be the basis for building decarbonization pathways in the SDA transport tool, since it provides the level of disaggregation and ambition levels required by the SBTi (B2DS). **Pending tasks:** • Include in the Deliverable 2 the comparison made with the ICCT and ITF models • Review GFEI data

2. Transport modes and vehicle categories

Proposed pathway disaggregation of transport modes and vehicle categories derived from the IEA MoMo:

Freight transport categories	Passenger transport categories
Total (all categories)	**Total (all categories)**
LDV / HDV	LDV / HDV
3 / 4 Wheelers	2 Wheelers
Light commercial vehicles	3 / 4 Wheelers
Medium trucks	Passenger cars
Heavy trucks	Passenger light trucks
Rail	Minibuses
Air	Buses
Shipping	BRT
	Rail (Urban and Non-Urban)
	Air
	Maritime

Survey question: Do you agree to the proposed disaggregation of transport modes and vehicle categories derived from the IEA MoMo?

Feedback received during consultation:	Survey results showed an overall acceptance of the transport modes and the vehicle categories included. However, vehicle manufacturers made the case that other considerations might be necessary. These considerations included: 1) Vehicle manufacturers produce different product mixes of (e.g. 2 wheelers, light commercial vehicles, buses etc.). Having specific pathways for each of these vehicle categories would be a constraint due to the disclosure of sensitive information, such as the company´s growth strategy. Alternatively, having a pathway that groups several vehicle categories (e.g. LDV, HDV) would allow the company to plan its growth considering vehicle diversification.

	2) In general, vehicle manufacturers are familiar with the unit v-km. Light duty vehicles could be used for passenger transport or freight transport. The difference when building the pathways for passenger and freight would be the occupancy rates or load factors used, but the fuel economy of newly produced vehicles would be the same. 3) For a vehicle manufacturer, it is important to see the split between WTT and TTW. Other suggestions included: 1. Check if rail could be further disaggregated into urban and non-urban rail. 2. Check if shipping could be farther disaggregated into containerized and non-containerized (bulk). 3. Check if river transport is modeled in the MoMo.
Conclusions/ Decision(s):	The transport modes and vehicles categories in the table above will be derived for the SDA transport tool. Pathways for passenger rail transport will be divided into Urban and Non-Urban sub-categories. Taking into consideration the comments from vehicle manufacturers, the team will model / test the following: 1) New LDV&HDV as a grouped category vs pathways per each individual new vehicle category, 2) Creating new LDV&HDV pathways separately for passenger and freight (t-km and p-km) vs grouping them (v-km) 3) All of the above while considering WTW and TTW basis The SBTi team will also check if it is possible to further disaggregate shipping as suggested by the consultees.

3. 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 information will be integrated into deliverable 2, which will consist of an online interactive report.

The list of proposed regions and countries that will be covered in the technical paper describing key assumptions, growth projections, levers of decarbonization, etc, includes: World, OECD, non-OECD, EU27, Russia, China, India, Japan, USA, Latin America, Middle East, Africa.

Survey question: Is the rationale for target-setting that converge to global decarbonization pathways clear and justified?

Feedback received during consultation:	Many comments were received on this topic during the different stakeholder consultation opportunities. In general, convergence to global decarbonization pathways is well accepted as a justified option. Some recurrent or key comments were: • Technology wise, it makes sense that these tend to convergence. Activity wise (i.e. pkm) there are some regional differences especially for land transportation. • There is the need to provide guidance on accounting of scope 2 emissions (electricity upstream emissions). • There is the need to take into account modal shift in logistics. If a logistic company models a target using current mix of transport modes, it is difficult to reflect potential future modal shifts (i.e. to more carbon efficient modes).

	• Global convergence makes sense for both WTT and TTW emissions. These are technology dependent and not intrinsically geography dependent. • Manufacturing of vehicles should be accounted for (*For clarification, this corresponds to a separate carbon budget*).
Conclusions/ Decision(s):	Based on the comments received, the arguments already provided above, and the following bullet points, the team decided to continue with the proposed option of developing global pathways and use the carbon allocation mechanism of convergence for GHG target-setting. • Global decarbonization pathways recognize the effort of early adopters, however, regulations are becoming stricter than these global pathways in many countries and these should be met. • Global decarbonization pathways capture a broader spectrum of mitigation opportunities, than those based on specific country pathways. • Global decarbonization pathways help ensure that the global carbon budget is maintained. **Pending tasks:** 1. The SBTi will make available default values (i.e. occupancy rates, load factors) on a regional basis to support GHG accounting, but the emissions allocation mechanism is global convergence. 2. The SBTi will provide guidance on scope 2 GHG reporting. 3. The SBTi will develop and test a combined freight pathway (multi-modal companies) to address the issue of modal shift. 4. The SBTi will provide a zoom-in into regional information in deliverable 2, "Technical Paper", which will consist of an online interactive report. The regions to include in these visualizations are: World, OECD, non-OECD, EU27, Russia, China, India, Japan, USA, Latin America, Middle East and Africa. 5. The SBTi will include in deliverable 3, "Target-setting guidance" additional guidance on targets modeled using regional pathways (e.g. using custom tools). The guidance is that these targets can be accepted by the initiative as long as they are more ambitious than the correspondent SDA global pathway. Also, that national regulations can be more ambitious than the global pathways and therefore companies would need to take this into consideration when modelling their targets. 6. The will include explain in deliverable 3, "Target-setting guidance" that emissions from vehicle or autopart manufacturing are part of the SDA tool, but these are considered in another sector called "Other industry", and therefore not addressed in this refinement project.

4. 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 WTW emissions for GHG target-setting, as more opportunities for mitigation are captured in a WTW basis, as well, as the shift of emissions between TTW and WTT due to the switch in power train technologies.

The SBTi encourages companies to use CO2e for all scopes (1, 2 and 3) and use this for target setting.

Survey question: Are the proposed reporting and target-setting requirements clear and justified?

Feedback received during consultation:	In general there were no objections on using CO2e.Only a doubt came out in the team if test procedures include non-CO2 gases. The team will investigate this. The matrixes built and shared with the consultees resulted a bit complicated to understand. Nevertheless, the main arguments on the WTW discussion were: For vehicle owners is relatively easy to influence upstream emissions (WTT), as they ultimately take the decisions of which vehicle technology to use as well as fuel / power source. On the other hand, some vehicle manufacturers believe they have little influence on these upstream emissions. Arguments provided in favor of using WTW modeling for vehicle manufacturers were: • There is a co-responsibility between supply and demand. • Electrification of road transport is required to meet the 2DS and B2DS goals. Therefore, there is the need for innovative and collaborative action. • Requiring WTW targets opens the possibility to reduce emissions, upstream, downstream or in both. Setting this requirement levels the playing field, for example for companies already manufacturing electric vehicles for which their product use emissions should cover electricity generation. All vehicle manufacturers can set a WTW target and freely decide how to best mold their strategy to maximize emissions reductions where possible. *Note: The IEA confirmed that WTT emissions already includes emissions due to electricity generation.*
Conclusions/ Decision(s):	Based on the discussions during the consultation period, the SBTI concluded: 1. WTW targets will be required for all companies regardless if they are vehicle owners, vehicle manufacturers or for emissions in the value chain. The GLEC framework requires reporting on a WTW basis. The GHG Protocol also requires upstream and downstream emissions reporting but spread out through different scopes. The “target setting guidance” will provide guidance on what scopes to input into the tool to obtain the full WTW picture. 2. Best practice is to report in CO2e (GLEC framework, GHG Protocol). Therefore, the SBTi recommends using CO2e for GHG target-setting. Any exclusions, for the purpose of the SBTi Call to Action campaign, can´t be greater than 5% of combined scope 1 and 2 emissions.

5. 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.

Survey question: Idling and empty-running should be included in reporting Scope 1, 2 and 3 emissions as well as in the target setting process. Assumptions made by transport companies on idling and empty running should be transparent.

Feedback received during consultation:	There is an overall acceptance that these emissions should be included in both emissions reporting and for target-setting. This seems to be common practice for scope 1 and scope 2 reporting. The challenge is for scope 3. Currently, empty running and idling is included in calculations for scopes 1 and 2 (as this is part of the fuel use), while for scope 3 it is mostly either reflected via an adjusted load factor or by adding an extra amount for empty running and idling.
Conclusions/ Decision(s):	These emissions should be included in the GHG inventory and target, to be reflected in real global GHG accounting (also empty running and idling are including in test procedures) and to ensure all emissions are covered under a target and therefore considered for mitigation. **Pending tasks:** There are several options to calculate these emissions: a) Adopt an average load factors (ex. 50%), b) Adopt a company or region-specific load factor based on actual operating conditions or, c) Add +5% of distances for example to consider empty running. Include GLEC guidance in the deliverables of this project.

6. Accounting of electricity emissions of electric vehicles

Survey questions:

A) Vehicle owners & sub-contracted transport

The proposed approach for accounting of electrification of transport (rail, road) is a follows: Emissions related to electricity generation for the electricity used per transport mode, and other upstream emissions from fuel and energy related activities (WTT), are added to the direct emissions (TTW), then divided by the activity level to calculate a combined WTW carbon intensity pathway in gCO2e/p.km or t.km per transport mode/vehicle category. This approach reflects the shift of emissions from one scope to another, due to electrification. This approach would be applicable to vehicle owners and sub-contracted transport.

B) Vehicle manufacturers

The proposed approach for accounting of electrification of newly built vehicles (Light-duty vehicles, Heavy-duty vehicles) is a follows: emissions related to electricity generation (the electricity used over the product use phase of a vehicle emissions) are accounted for in the WTT carbon intensity calculated for existing LDVs and HDVs. This carbon intensity is added to the TTW carbon intensity of new vehicles (derived from fuel efficiency) to develop a combined WTW intensity pathway in gCO2e/v.km per vehicle category. This approach would be applicable to product use phase emissions reported by vehicle manufacturers.

Feedback received during consultation:	Some comments received were: • Measuring Scope 2 emissions can be very difficult as companies don't know how their clients/employees source their electricity and this can lead to uncertainties. • WTT and TTW have a different nature to mitigate the emission. Combining part or all of them would influence the difficulty in target setting.

Conclusions/ Decision(s):	In general, these approaches were accepted. **Pending tasks:** 1) Since it is now confirmed that scope 2 emissions are embedded in the IEA's WTT portion, the SBTi would only need to provide guidance on which scopes to input into the tool, to obtain a full WTW pathway. In addition the SBTi can provide electricity emissions factors for different regions. 2) Even if the tool uses a combined pathway (WTW) for all transport modes, further insights can help companies to build their GHG reduction strategy. For example, showing the pathway for scope 2 emissions (electrification is the main difference between the 2DS and B2DS), or for vehicle manufacturers a split between WTT and TTW would be useful. Therefore, the SBTi team will propose a way to reflect these pathways in the SDA transport tool.

7. 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 it is less accurate and limits 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. Chapter 7 of the GHG Protocol Scope 3 Standard provides further guidance on data quality issues; GLEC Framework offers additional details for freight transport.

Feedback received during consultation:	Most of the survey respondents agree or strongly agree that using real emissions should be the norm. However, the challenge is providing a recommendation of a standardized approach to estimate/adjust these emissions. On the topic of actual vs default factors, comments were around data constraints on fuel consumption and activity, due to several reasons: a) subcontracting, b) difficulty to install meters, c) aggregated measurements (i.e. global consumption of fuel for Air transport).
Conclusions/ Decision(s):	All companies must report emissions and set targets based on actual emissions and not on estimated emissions using test procedure emission factors. SBTi will provide the conversion factor used in the MoMo, e.g. a table with suggested factors for different driving cycle test procedures, which may be used by vehicle manufacturers in estimating emissions for new vehicles. The SBTi encourages to use the best data available, and preferably actual data since these will better reflect the impact of different companies and facilitate the evaluation of target progress.

8. Calculating air freight emissions

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.

Survey question: Is this approach for estimating air freight emission from shared passenger and freight commercial aviation clear and robust?

Feedback received during consultation:	There is some agreement that this could be a reasonable approach. However, there is the need to put together a specialized group on air transport to further validate this approach. Another comment received is that the effect of radiative forcing needs to be addressed in the carbon intensity pathways for both passenger and freight air transport.
Conclusions/ Decision(s):	The IEA confirmed that the air transport emissions embedded in the MoMo are all aggregated into a single pathway (passenger flights, combined passenger-freight flights and dedicated cargo flights). There is complexity in trying to disaggregate these emissions, due to data availability. The SBTi team is contacting interested consultative group members and survey respondents to integrate this group and find a practical approach for disaggregating air freight transport

9. Approach for logistic companies

Using a combined freight pathway: A company relying on multiple transport modes needs to account for modal shifts as part of its decarbonization strategies. This could be reflected by creating a combined freight pathway in gCO2/t-km, where activity and emissions data from all freight transport modes could be utilized to create a single combined carbon intensity trajectory for all freight (i.e. road, rail, air and maritime)

Potential applicability

For this approach to be robust, it is key to differentiate between single/multiple mode companies:

- Single-mode companies would have to utilize the corresponding modal intensity decarbonization pathway
- Multi-mode companies would have to utilize a combined freight modal intensity decarbonization pathway

The combined freight intensity approach must be applied consistently for target setting across S1, S2 and S3. This means that a logistics company owning only HDVs would need to define a S1+S2 target around HDV intensity pathway and, if its S3 emissions are deemed multi-mode, then they'd need to set a target against the combined freight intensity pathway.

Setting a growth threshold: Companies should project growth equal to or higher than that of the sector, otherwise underestimating growth (in terms of absolute emissions) could lead to an exceeded carbon budget.

Survey question: Is the proposed approach for addressing avoid and shift in logistics companies (i.e. converging to a combined freight intensity pathway clear and robust?

Feedback received during consultation:	**Note:** This proposal came out during the Paris Consultation Workshop. Therefore, it was included as another methodological choice in the online survey. This approach makes sense, but in general consultees would like the SBTi to test it. Some comments received: • Convergence approach doesn't always apply for multi-mode companies, as this would force the companies to have the same mode division in 2050 (year of convergence). As the modal shift mainly applies to air transport, the suggestion is to provide guidance on the volume of this modal shift. • It may be useful to include discussion of avoided emissions.
Conclusions/ Decision(s):	The SBTi will test the proposed approach. This topic is not related to avoided emissions (i.e. comparison against a BAU or other reference technologies), but about reflecting modal shift. This will be explained in the project deliverables.

10. Target-setting under a B2DS

The SBTi continues to recommend that companies go beyond the minimum required 2°C pathways and pursue targets that are in line with the well below 2°C objective. This entails setting more ambitious targets than those derived using the IPCC RCP 2.6 and IEA 2 degree scenarios (methods to date rely on these scenarios). 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." The Science Based Targets initiative plans to develop guidance on pursuing a well below 2°C pathway as scenario information becomes available.

Considering that both the well-below 2°C and the within 2°C 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.

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 […]

Survey question: Which of the following options do you consider to be most adequate as a transition process by the SBTi for a new target setting requirement based on a below 2 degree scenario?

Feedback received during consultation:	Several alternatives were suggested, for example: a) having a phased B2DS requirement, b) applying differentiated recognition to 2DS and B2DS targets, c) having a revision mechanism for 2DS targets to migrate to B2DS targets; and others.
Conclusions/ Decision(s):	All comments received will help inform a broader discussion within the SBTi. The SBTi intends to align its requirements and guidance with the goals of the Paris Agreement. A broader consultation will be conducted by the SBTi on this topic, not only for transport but for all other sectors. For the purpose of this transport project, 2DS and B2DS pathways will be developed in the tool.