# THE NORDIC CASE

## Measuring the Sustainability of Tourism

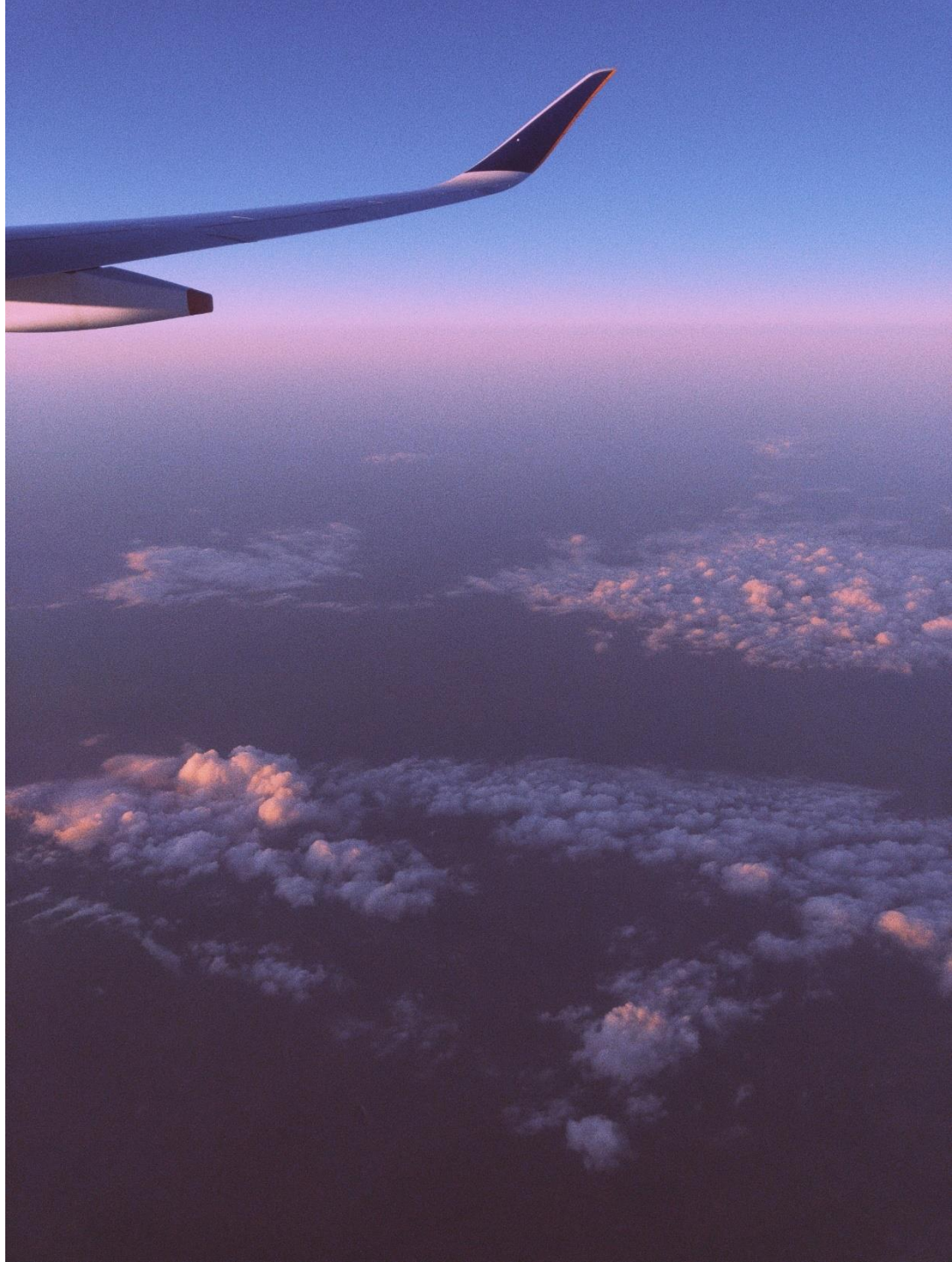
- 4th Meeting of the Expert Group

KATHRINE LINDESKOV JOHANSEN & JONATHAN LINDAHL

- CENTRE FOR REGIONAL AND TOURISM RESEARCH

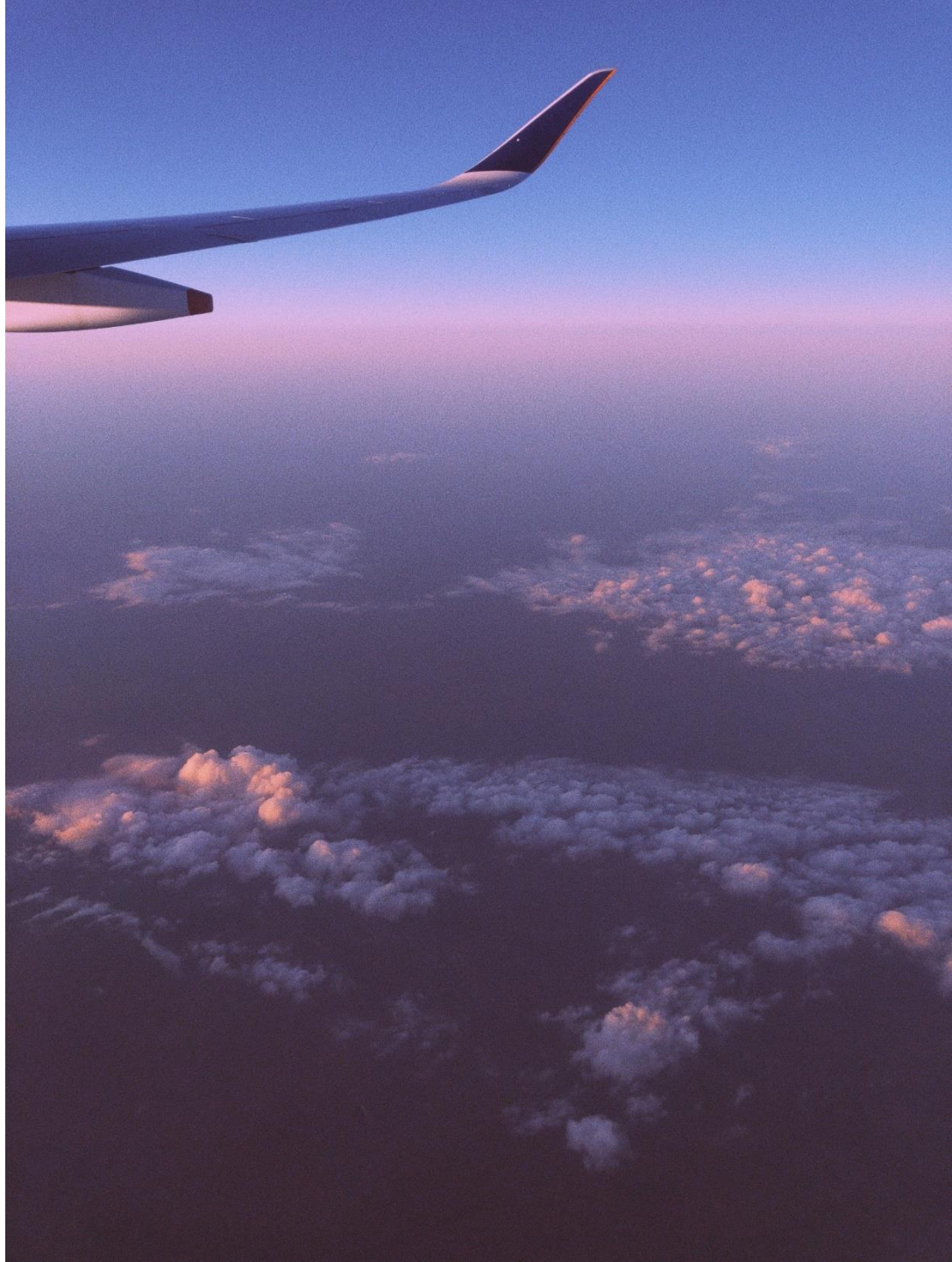
# TOURISM'S ENVIRON-MENTAL IMPACT

- Harmonizing methodology on tourism's $CO_2e$ emissions in the Nordics funded by Nordic Council of Ministers
- Current phase: Deliver a Nordic methodology guide and pilot compilations for at least 2 entities.
- We are compiling with Finland and Denmark; with Sweden we are in the planning stage and Iceland are deciding.
- Greenland, The Faroe Islands and Åland will need both a TSA or SEEA in a prerequisite path. Norway has declined to participate until the UNWTO have adopted regulations.
- We follow UNWTO's guideline → primary focus on direct effects

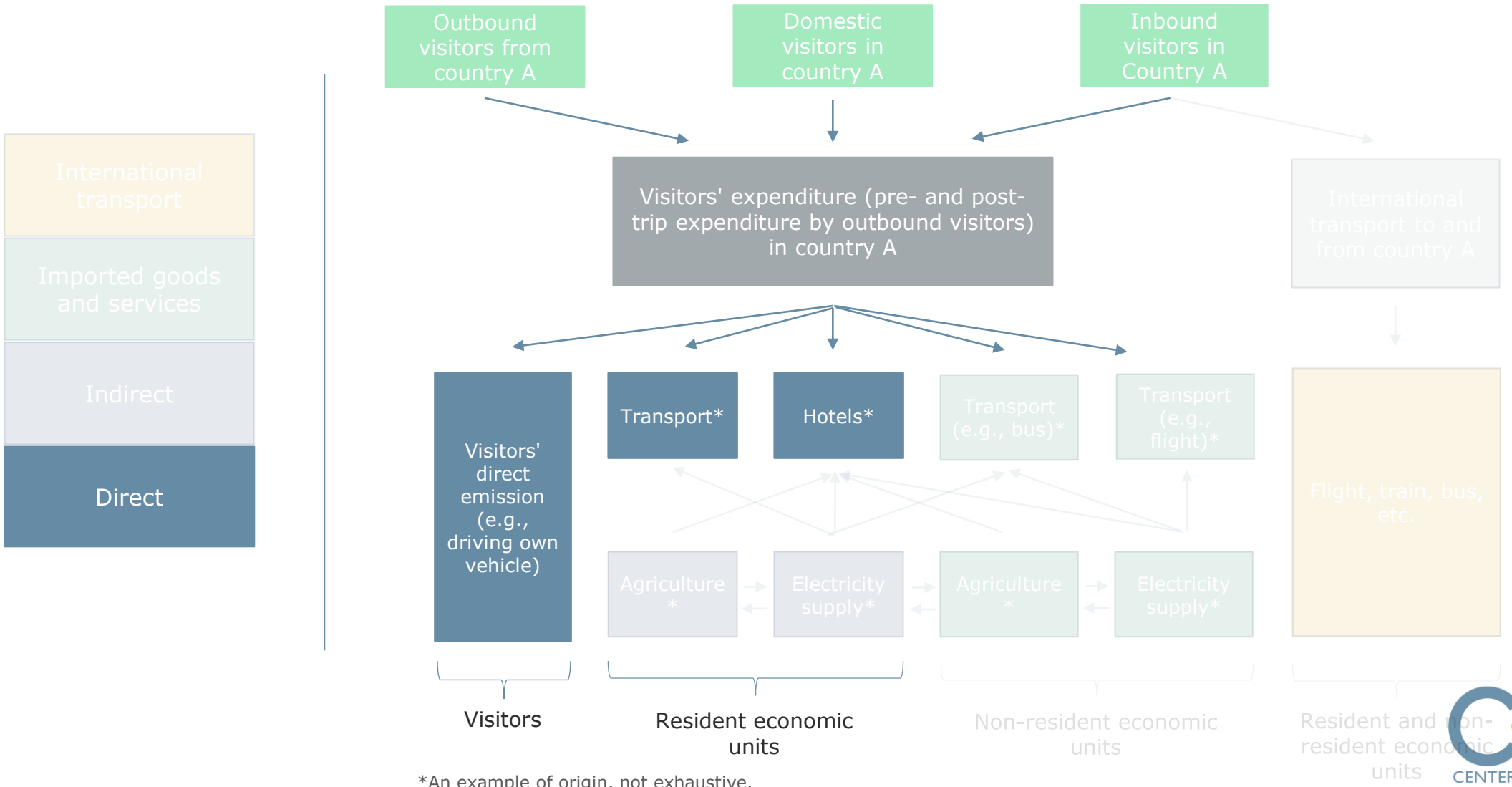


# TOURISM'S ENVIRON-MENTAL IMPACT

- We follow UNWTO's guideline → primary focus on direct effects
- *"However, beyond the measurement and attribution of direct environmental flows as discussed so far, there may be strong analytical and policy interest in understanding the environmental connection between visitor activity and the associated supply chains that provide goods and services to visitors."*
  *- UNWTO: SF-MST*
- Therefore, we extend at least one pilot compilation (the Danish) going beyond the direct flows, yet still within the UNWTO guidelines but with some state-of-the-art exploratory compilations
- This phase is expected to be finalized at the end of this year.



# UNWTO FRAMEWORK - FINLAND




*An example of origin, not exhaustive.

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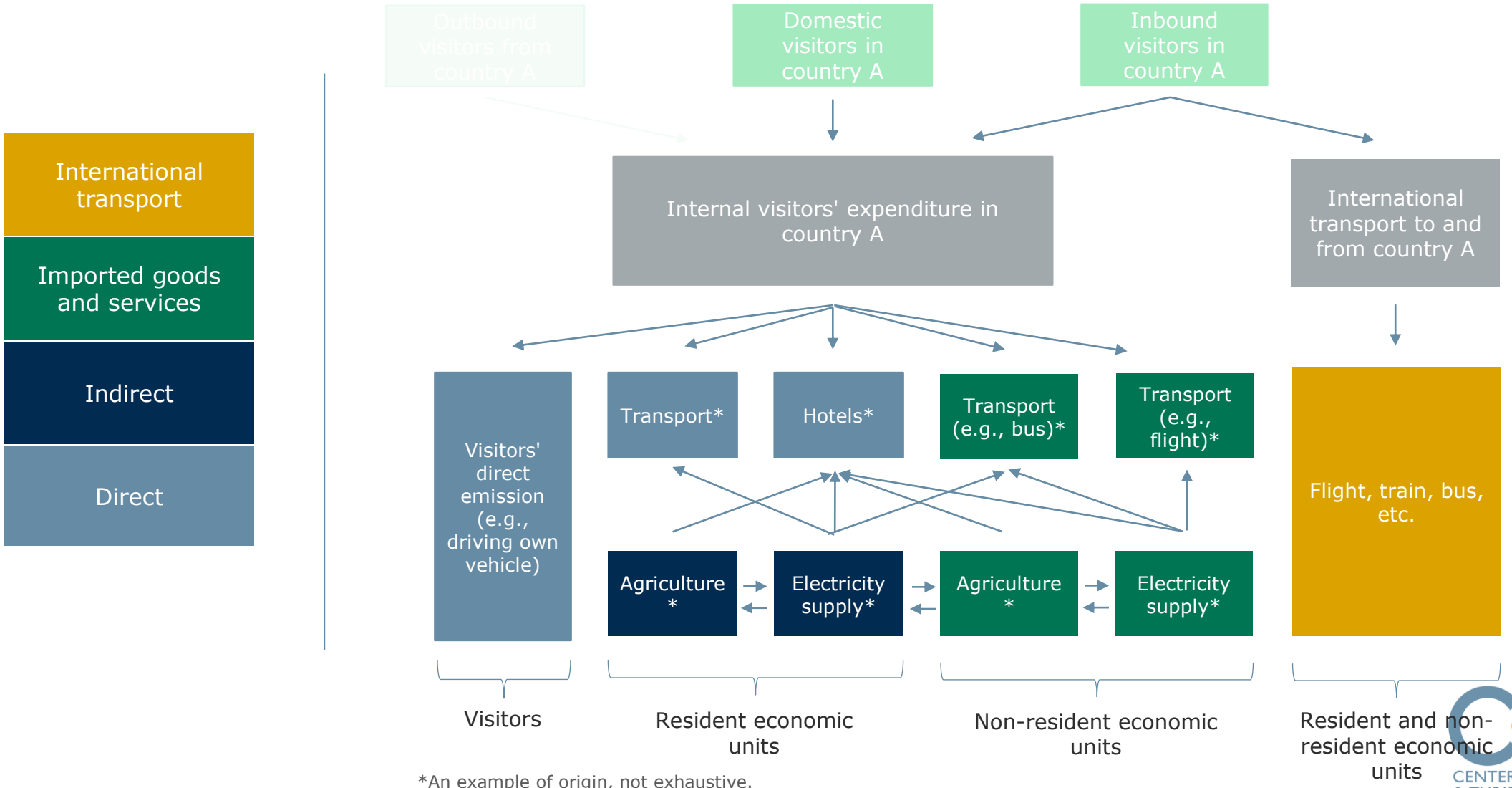
# UNWTO FRAMEWORK - DENMARK

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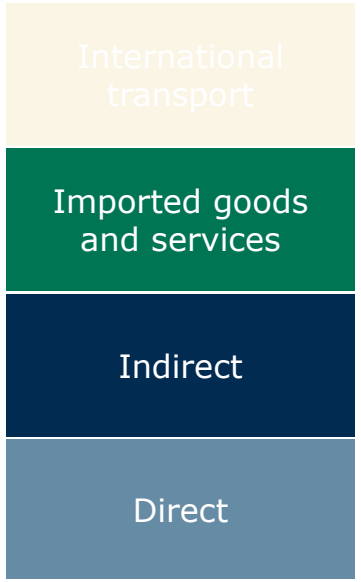
# METHOD - DENMARK




- Performed by utilizing an environmentally extended MRIO model combined with a regional TSA.
- The calculation of GHG emissions from international transport is not based on a MRIO model.
- Instead, we compute it separately using physical data.
- Attention points:
  - We lack precise information about the route for the visitors.
  - Difficult to distribute GHG emissions if the tourist visits different countries.

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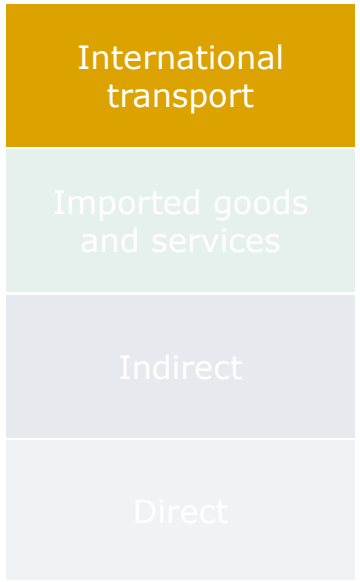


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# METHOD - DENMARK

International transport

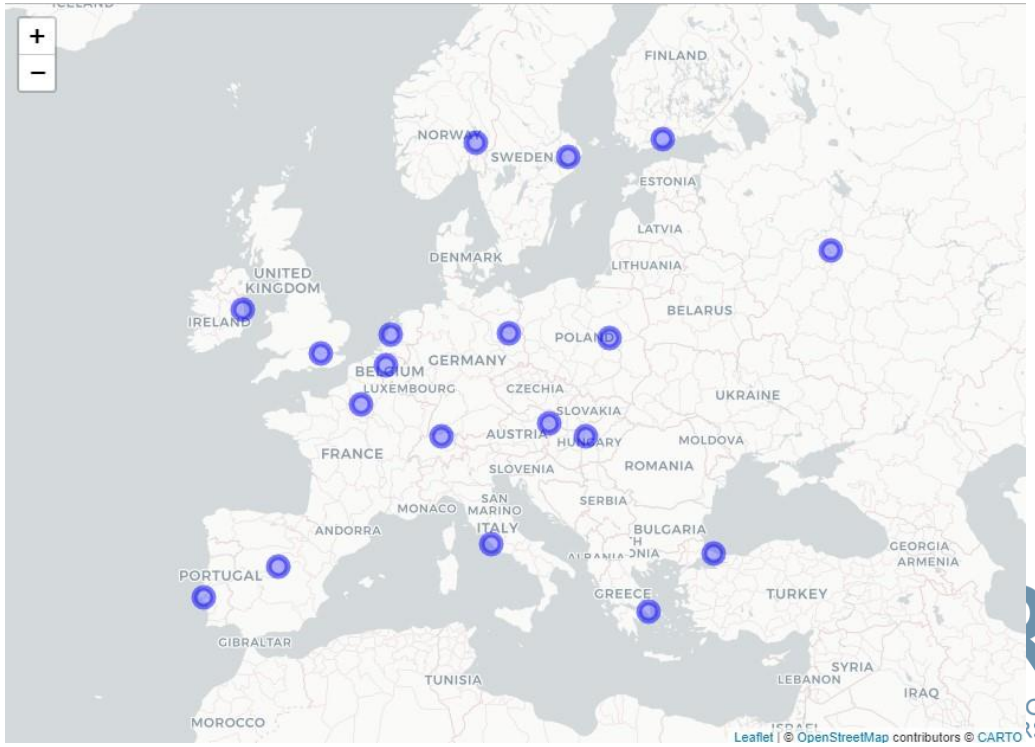
Imported goods and services

Indirect

Direct

- We assume each country/region starts from its capital city and follows the fastest route to Denmark.
- Hence, we don't consider visitors visiting multiple countries.

- **Driving** (e.g., cars, auto camper, etc.): Google Maps
- **Transit** (e.g., bus, etc.): Google Maps
- **Flight** (we might expand with multiple routes using airport data.): ICAO
- **Ferry** (direct connec-tion): Google Maps



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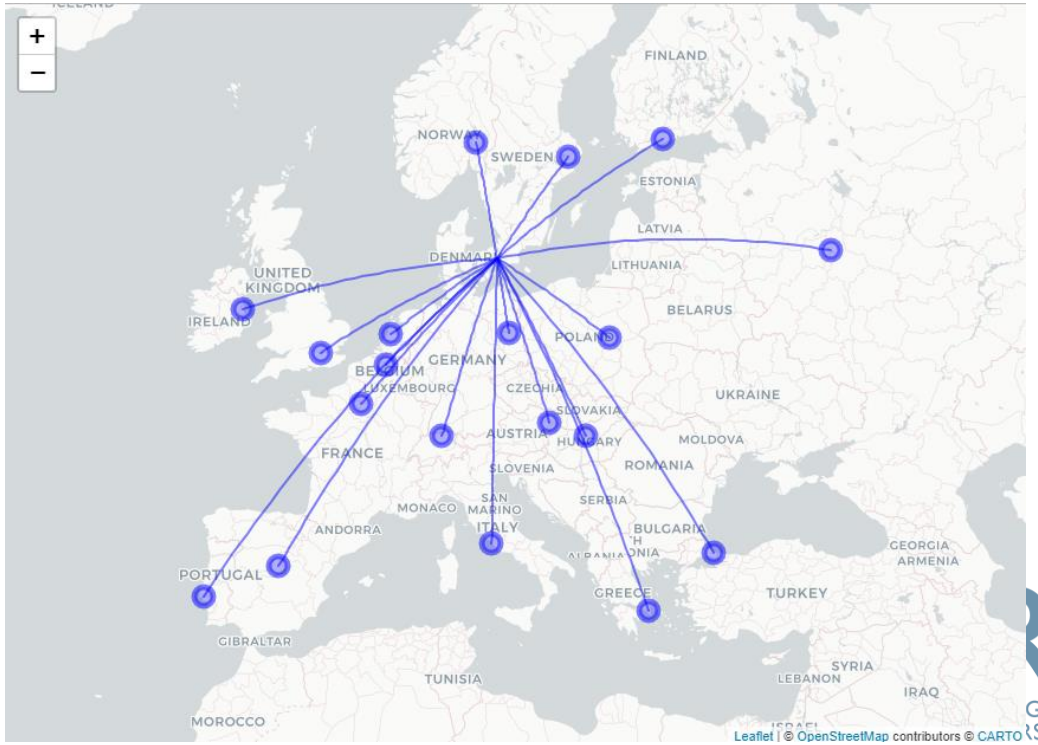

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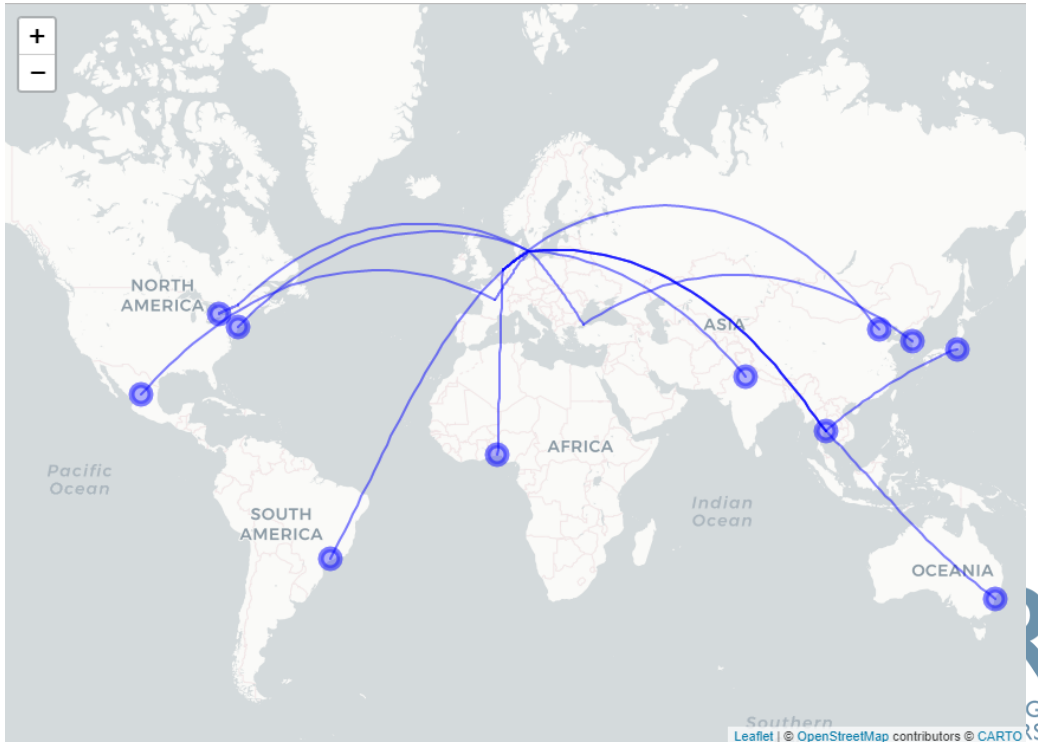

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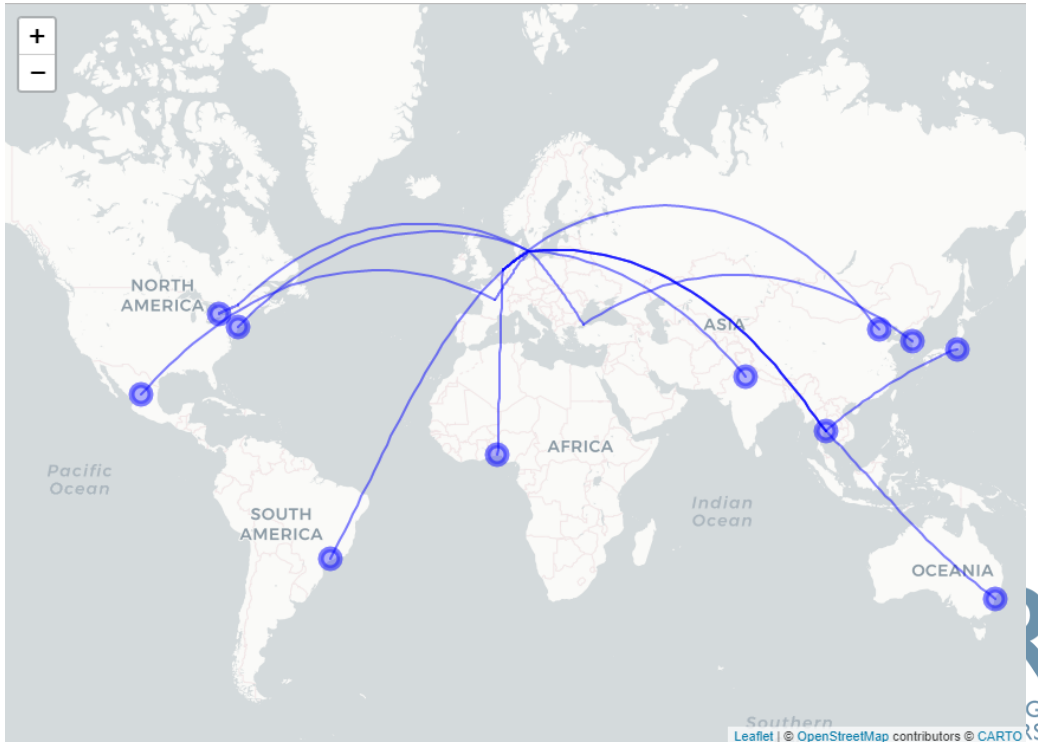

# METHOD - DENMARK

International transport

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Direct

The distances are multiplied by the emission factor and numbers of travelers:

**Emission factor:**

- Mainly based on Danish data
- Flight: ICAO's flight emissions tool

**Numbers of travelers:**

- The transport mode by the travelers as well as occupancy rate in private vehicle (e.g., cars, auto camper, etc.) is based on a survey

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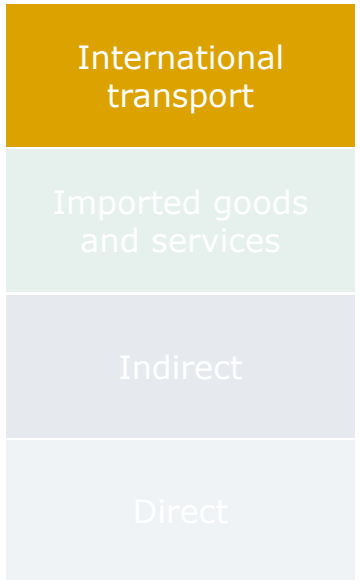
# CONCLUSION




This framework provides a blueprint for calculating the entire carbon footprint of tourists mainly based on public data, aligning with the UNWTO framework.

There is still room for improvement (future work), particularly in international transport, including:

- Obtaining better data.
- Determining how to allocate GHG emissions when visitors travel to multiple countries.
- Developing a method or framework for accounting for cruise ship emissions.

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# APPENDIX: EXAMPLE - DENMARK

International transport

Imported goods and services

Indirect

Direct

**Example: Finland (Helsinki) → Denmark (Copenhagen)**

Distance (km):

| Transport mode | Driving (e.g. gasoline car) | Bus | Train | Ferry - gangway | Ferry - with car | Flight |
|---|---|---|---|---|---|---|
| Driving | 926 | | | | 206 | |
| Transit | | 172 | 639 | 317 | | |
| Flight | | | | | | 890 |

CO2 (g) per person kilometer:

| Car - gasoline | Bus | Train | Ferry - gangway | Ferry - with car | Flight |
|---|---|---|---|---|---|
| 65 | 26 | 14 | 109 | 391 | 119 |

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# APPENDIX: EXAMPLE - DENMARK

International transport

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**Example: Finland (Helsinki) → Denmark (Copenhagen)**

Results*:

| Transport mode | CO2 (kg) |
|---|---|
| Car – gasoline | 141 |
| Transit | 48 |
| Flight | 106 |

The calculations is done for 31 countries/regions and other transport mode as well (e.g. motorbike, auto camper, electrical car, hybrid car, etc.). Thereafter, the numbers are multiplied by the numbers of travelers by transport mode.

* The results for this example is still preliminary.

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