

TFEIP User Engagement

Additional guidance for emission inventory users

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Jeroen Kuenen (TNO, Netherlands)



Feedback from modellers (2025-2026)

- Key to have consistent datasets between Annex I template, gridded data, LPS
 - If LPS is not consistent with gridded data, it is very difficult to work with this data
- Key inputs beyond the regular emission inventories are:
 1. Speciation profiles for PM, NO_x and SO_x and how these change with time
 2. NMVOC speciation profiles
 3. Emission temporal profiles
 4. Emission release height and heat content

Draft guidance

- Delayed due to no resources – but initial draft (not yet complete) is available now
- Not for inventory compilers, but for users of our emission inventories
- Draft v0.2 was developed in 2025, and cross-checked with key stakeholders in the Convention (MSC-W, CEIP)
- Information currently included is largely based on global or European studies
- Next step is to complement this with information available from countries

“Using emission inventories for air quality modelling”

TFEIP Guidance document

Version 0.2, 23 March 2026

Drafted by: TFEIP Expert Panel on User Engagement

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Introduction

- Introduction to the elements of emission reporting which are not part of the main national inventory (NFR tables) and to the needs of the emission user community

Table 1 Reporting requirements related to emission inventories in Europe

Emission dataset	Legislative instrument	Comment	Reporting frequency
National emission inventories	Gothenburg Protocol (UNECE) NEC Directive (EU)	Annual totals, country totals	Annual
Gridded emissions	Gothenburg Protocol (UNECE) NEC Directive (EU)	Annual totals, 0.1°x0.1° horizontal resolution	Every 4 years
Large point source (LPS) emissions	Gothenburg Protocol (UNECE) NEC Directive (EU)	Includes lists of point sources	Every 4 years
IED emissions	Industrial Emissions Directive	Formerly E-PRTR	Annual
(tbc)			

Temporal profiles – simple method

- First a simple methodology

2. Temporal disaggregation of emissions

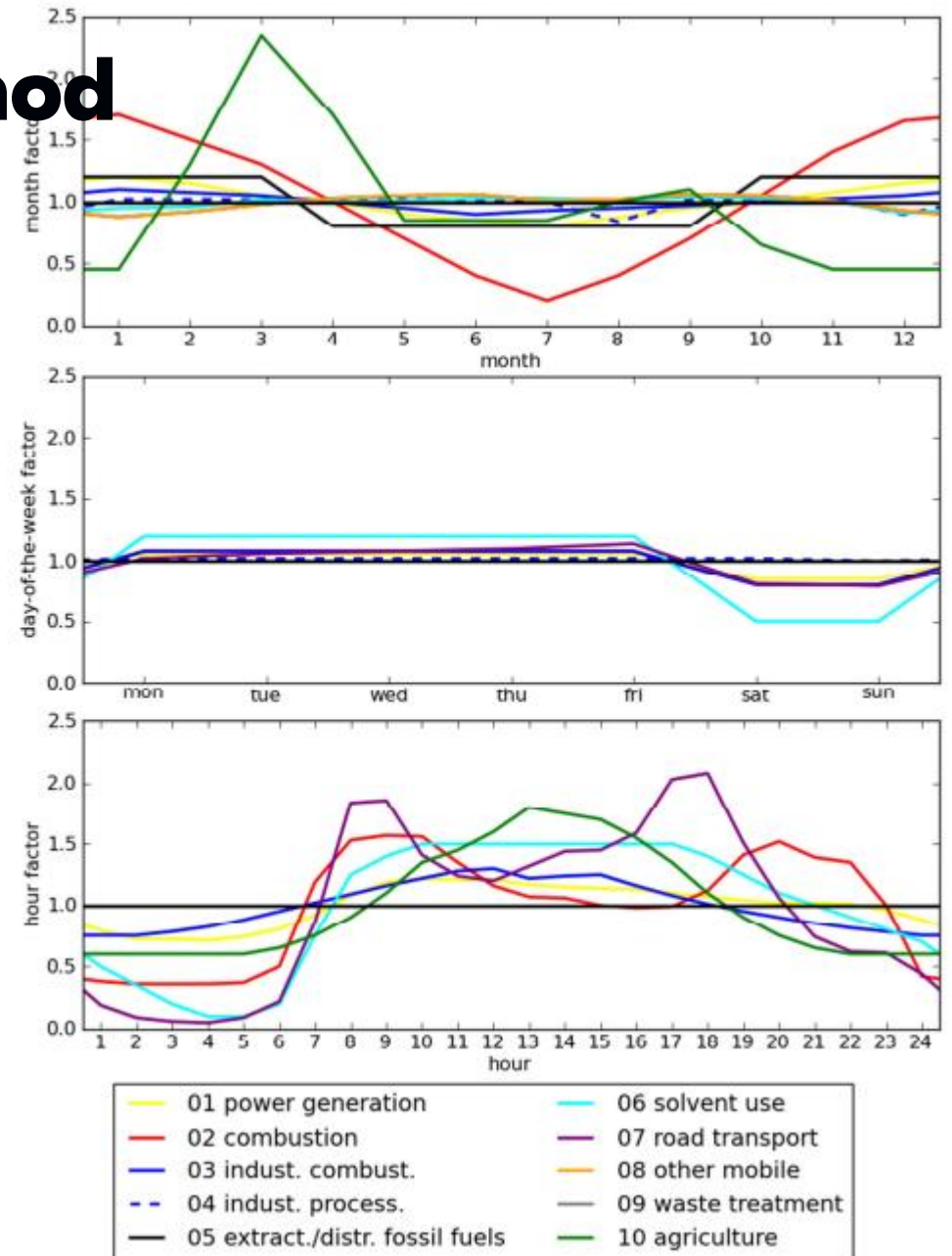
Emission inventories report annual totals per sector and pollutant for each country. For use in models, a breakdown of annual totals into hourly values is needed. Several datasets have been available in the past to perform this downscaling.

Different methodologies are available as outlined below.

2.1. Simple method

The most simple way to derive hourly emissions based on the annual totals is by applying the following formula:

$$E_{hourly} = \frac{1}{N(year)} \times E_{annual} \times f_{month_in_year} \times f_{day_in_week} \times f_{hour_in_day}$$



Temporal profiles – more advanced method

More sophisticated methods are better able of capturing differences e.g. between different European countries

2.2. Detailed methodologies

The simple method described in Section 2.1 is a very simplified way to describe emissions. With increasing computational facilities, the demand for more accurate temporal representation of emissions is ever increasing. Multiple datasets have been developed over the last years which the user of emission inventories may be able to implement. Some examples are shown in Table X below.

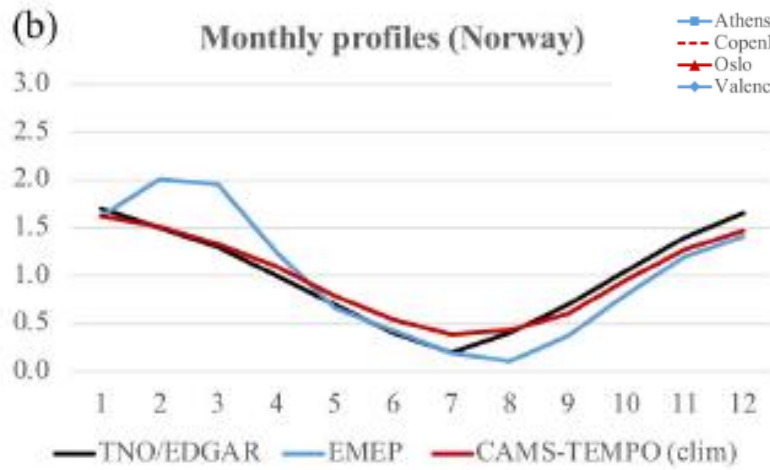
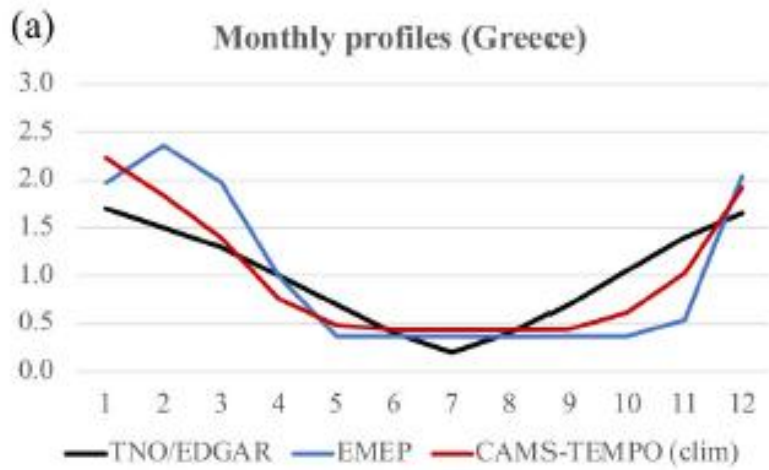
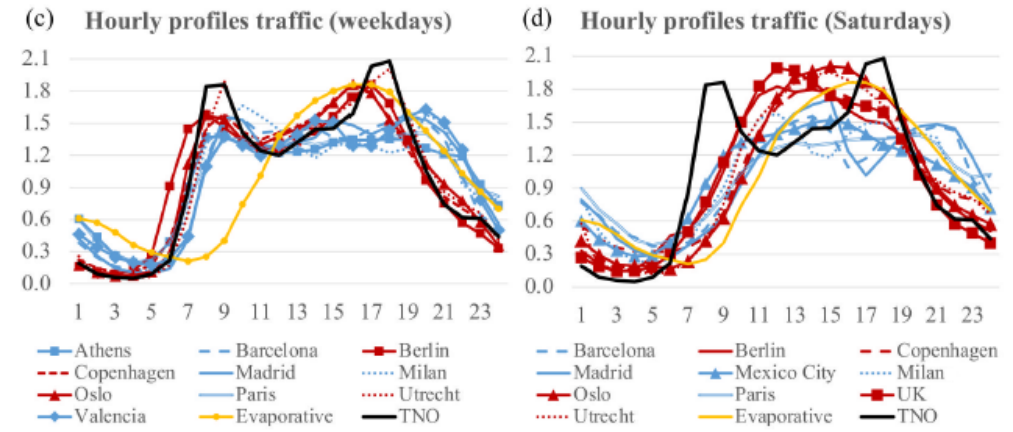
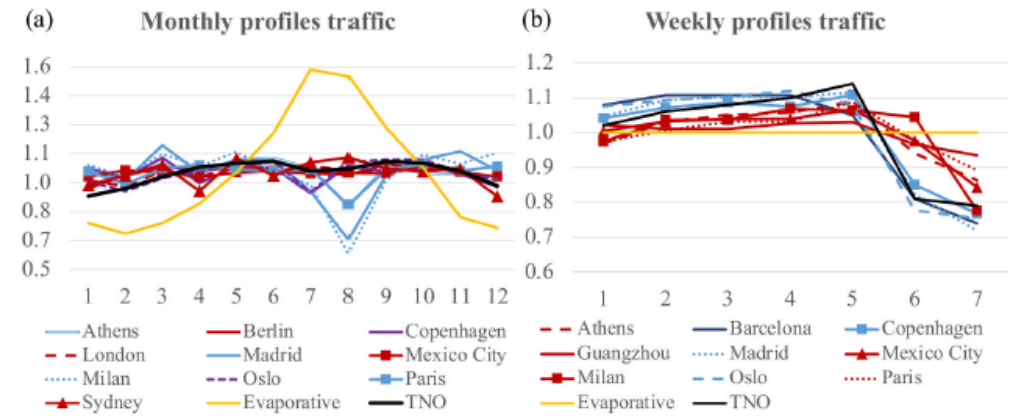
Table X: Different information sources for disaggregating annual emissions to daily/hourly scale

Reference	Highlights
CAMS-TEMPO (Guevara et al., 2021)	Temporal emission variation for main air pollutants and greenhouse gases including monthly, weekly, daily and hourly information. Results come as gridded profiles (0.1°x0.1° globally, 0.1°x0.05° for Europe) per GNFR category for the years. Depending on the source profiles may be in a different format. Also simplified profiles are available (per country, year, GNFR are available) which are more directly usable.
EDGAR temporal profiles (Crippa et al., 2020)	Monthly (and hourly) emission variation that fits well with the EDGAR global emission inventory. Data are sector (IPCC source category) and country specific. Monthly variation is available directly on the website, and also hourly data are reported to be available.
(more?)	

Example dataset

CAMS-TEMPO dataset, [Guevara et al. \(2021\)](#)

- Designed for CAMS-REG inventory – but also very suitable for reported gridded data (GNFR)
- Country specific profiles
- Even gridded profiles available

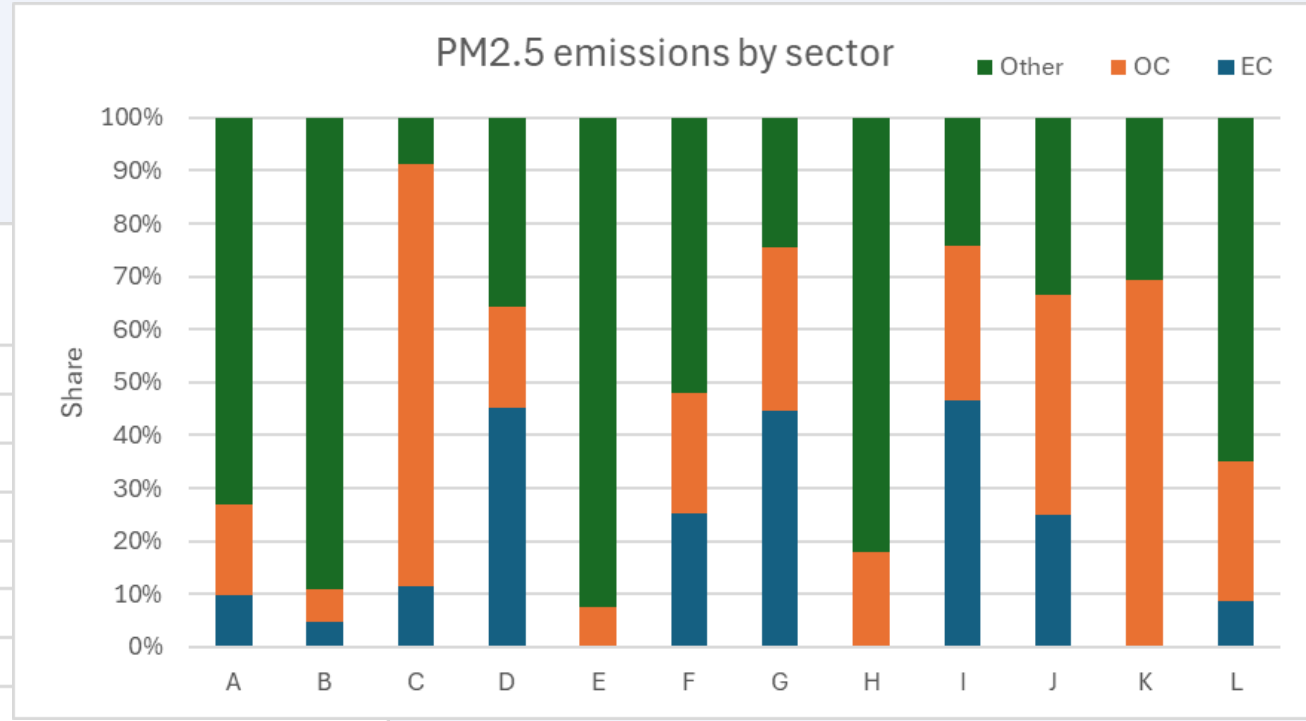
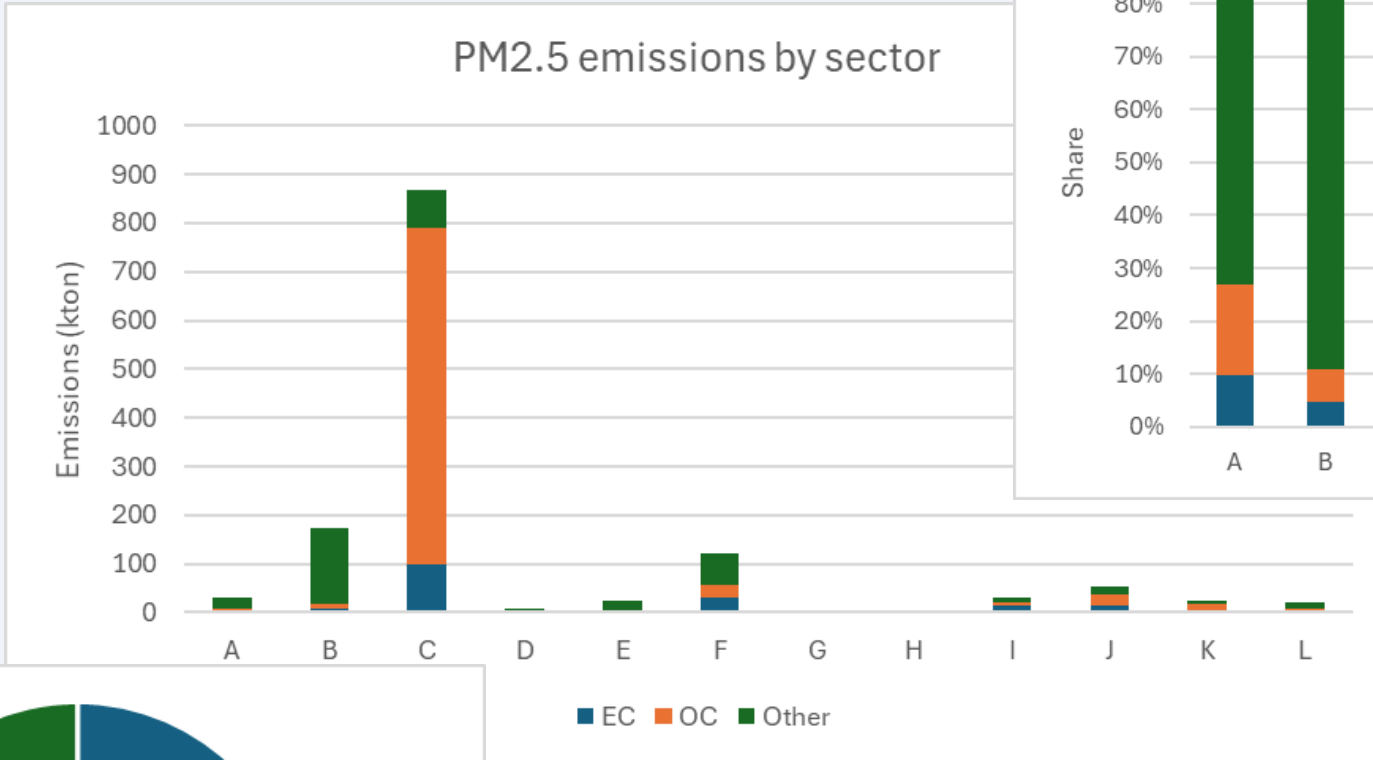


(using climatology, averaged HDD-based profiles for 2010-2017)

Speciation profiles

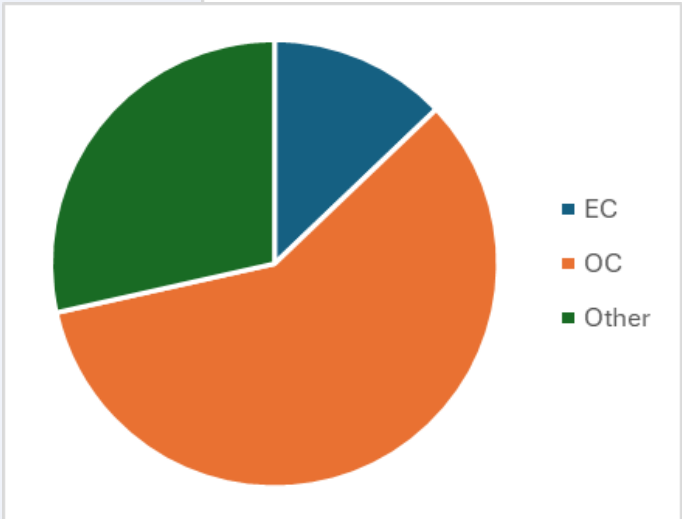
- Crucial information for modellers
 - PM split into at least elemental carbon (~ black carbon) & organic carbon
 - NMVOC split into key species groups
 - NOX and SOX split
 - ~~Heavy metals and POPs~~

PM speciation profiles



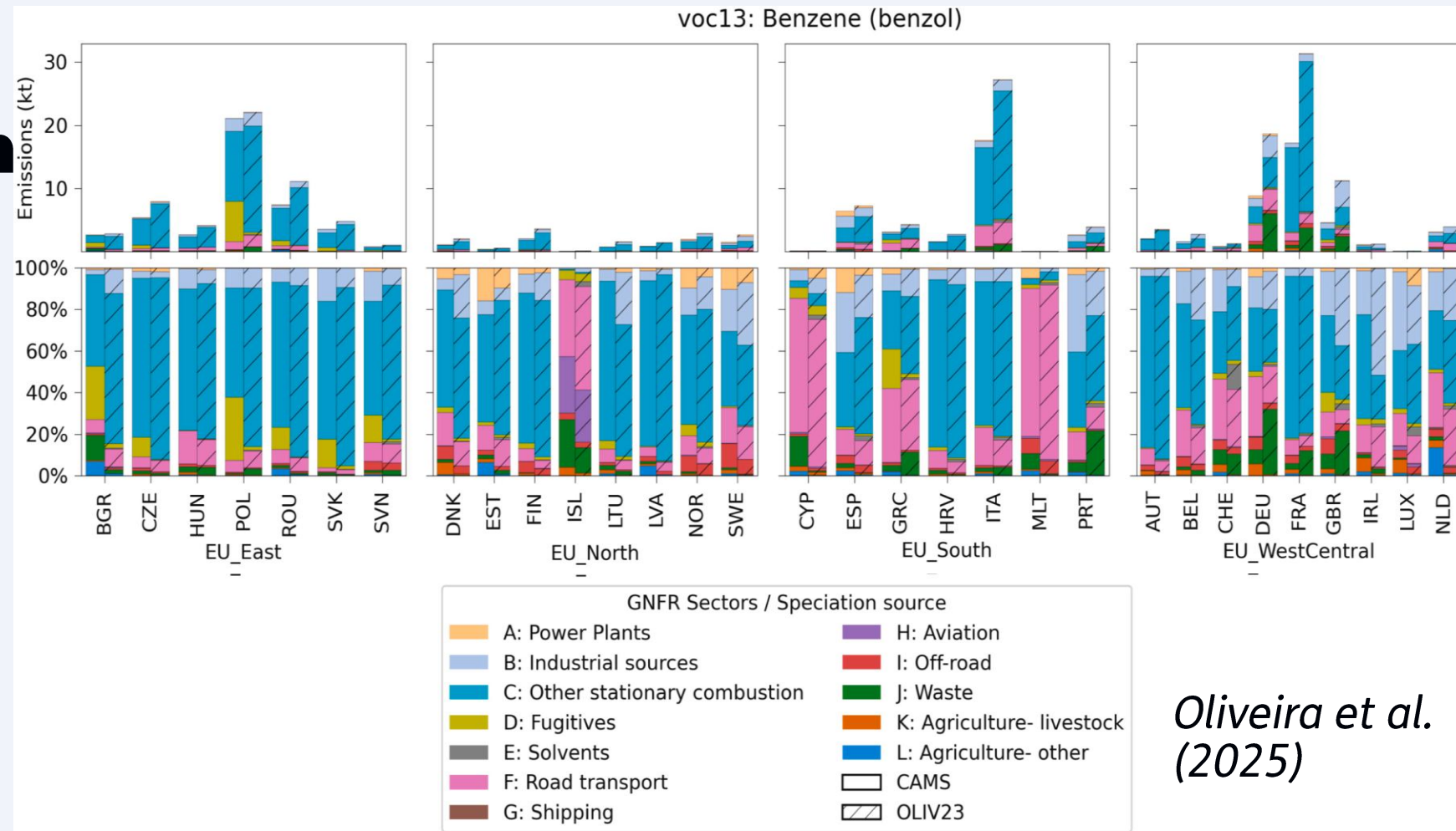
Source: CAMS-REG v8.1 inventory with PM speciation applied to PM2.5 (fine PM)

Coverage: EU27 + NO,CH,IS,UK, year 2022



- PM2.5 emissions dominated by small combustion sector => majority of PM emission is organic
- Speciation profile strongly dependent on sector

VOC speciation



*Oliveira et al.
(2025)*

- Varies considerably between countries because of different (sub)sources
- New profiles developed by Oliveira et al. (2025) – focussed on Spain but applied here for all of Europe

Next steps – refine the document

- **Feedback** on the document is welcome from everyone at TFEIP!
 - See the link on the TFEIP website (below the agenda of this meeting)
 - Corrections as well as additions (specific points, datasets, anything is welcome!)
 - Provide links to specific sources of information from your country (or elsewhere)
- Is there interest to do a **data collection exercise**, collect speciation information for those countries which have it available and are willing to share this?
 - We can collect country specific profiles to complement the European or global default profiles
 - A template can be developed which can be used to collect information

Thank you for your attention!

Please reach out for any questions or comments, and also if you'd like to contribute to this group

Jeroen.Kuenen@tno.nl