



Norwegian
Environment
Agency

The Norwegian emissions inventory

Methodologies for SLCFs inventory

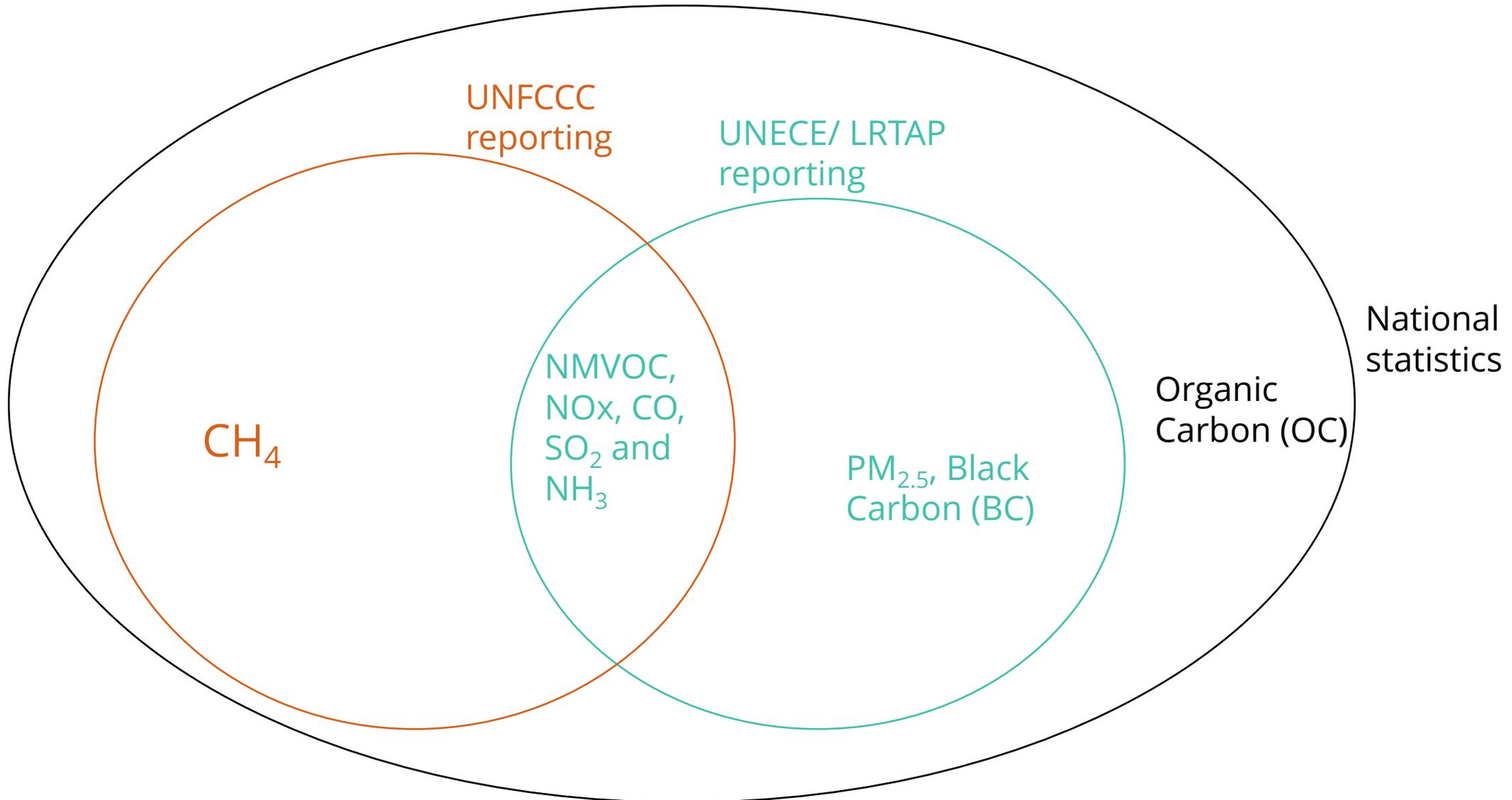
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Inventory in Norway

- **Cooperation** between Statistics Norway, the Norwegian Environment Agency and Norwegian Institute of Bioeconomy Research (LULUCF).
- National emission inventory developed **first in the 90s**.
- Norway reports emissions to UNFCCC, UNECE/LRTAP, Arctic council and EU.



Which SLCFs are estimated and reported?



Inventory, a long-term improvement process

T1 methodologies,
default AD, default EF

Advanced models, T2/T3
methodologies, reported data
from plants, CS or PS EF



Key categories have been prioritized and new methodologies have been developed based on:

- *Guidebooks and guidelines, international models*
- *Reporting from industries, including reporting under EU-ETS*
- *Scandinavian projects (peer to peer review, **practices exchange, emissions measurements, etc.**)*
- *Emission measurements to develop **specific EF or models***



Methane

- CH₄ emissions are estimated with the use of the IPCC guidelines (1996, 2006, 2019)

ENERGY	IPPU	Agriculture	Waste
AD: Energy balance	AD: Reported activity data from the plants	AD: Statistics and surveys	AD: Statistics and reported activity data
EF: CS, D	EF: PS, D	EF: CS, D	EF: CS, D

D: default, CS: Country Specific, PS: Plant Specific



BC and other SLCFs

- Emissions from PM_{2.5}, NO_x, CO, NMVOC, SO₂ and NH₃ are estimated based on the **EMEP guidebooks** (CORINAIR, ..., 2019)

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Methodological issues

- Data Collection:
 - Energy balance
 - Norwegian authorities give emission **permits** to industrial plants (air), wastewater treatment plants (water) which have to **report emissions and activity data**.
 - Annual surveys sent to farmers: activity data and practices (Norwegian Agriculture Agency)
- Time series consistency
 - Emissions are **recalculated** for the whole time series for any changes



Methodological issues – QA/QC

- Specific procedures within and between the different institutions involved in the inventory production:
 - Checks of emission factors and activity data and their documentation
 - Check of reported activity and emission data
 - Check of emission estimations
- Review process
 - Peer to peer
 - UNFCCC, EU
 - LRTAP



BC / OC

- Mainly based on estimated fractions of **PM_{2.5} inventory**
- BC/OC inventory has been developed in 2013, based on the work done by IIASA
- Norway used specific EF for:
 - wood burning
 - Flaring
- Some EF have been revised with the EMEP/EEA guidebook (from the 2013 version)

References

- IIASA: [Kupiainen, K. and Z. Klimont \(2004\). Primary Emissions of Submicron and Carbonaceous Particles in Europe and the Potential for their Control., International, \(IIASA\). and](#)
- [Kupiainen, K. and Z. Klimont \(2007\). "Primary emissions of fine carbonaceous particles in Europe." Atmospheric Environment 41\(10\): 2156-2170](#)
- Wood Burning: [Seljeskog, M., F. Goile, et al. \(2013\). Particle emission factors for woodstove firing in Norway. Trondheim, SINTEF Energi AS](#)
- Flaring: [McEwen, J. D. N. and M. R. Johnson \(2012\). "Black Carbon Particulate Matter Emission Factors for Buoyancy Driven Associated Gas Flares." Journal of the Air & Waste Management Association 62\(3\): 307-321.](#)



References

- Statistics Norway: [Aasestad, K. \(2013\): Emissions of black carbon and organic carbon in Norway 1990-2011 Statistics Norway](#)
- [The Norwegian National Inventory Report](#)
- [The Norwegian Informative Inventory Report](#)

