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Synergies with other policy areas, *including climate, SDGs, and methane mitigation*

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IIASA, International Institute for Applied Systems Analysis

Context and key messages

- The obvious
 - Air quality policy has climate implications
 - Climate and SDG driven policies will have impacts on air pollutant and methane emissions and consequently their impacts
 - Costs of reducing air pollution and its impacts will be likely lower if climate policies are implemented
 - Not all what is good for climate is good for air quality...and vice versa

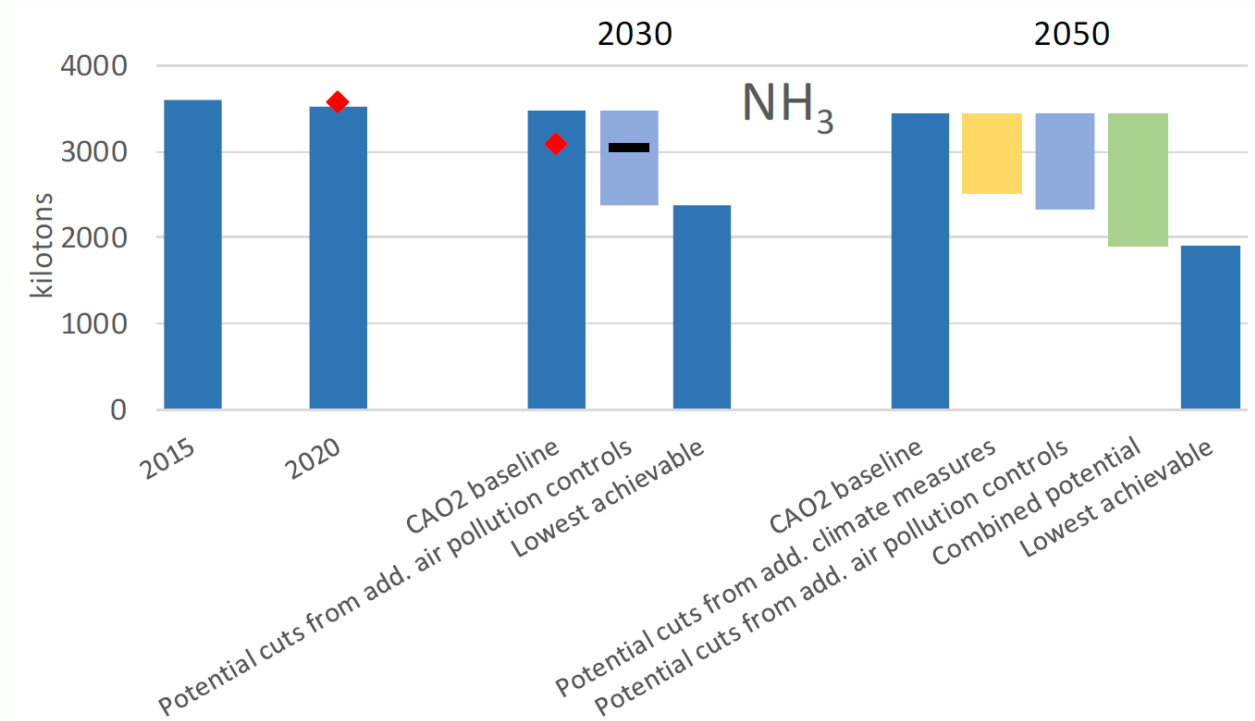
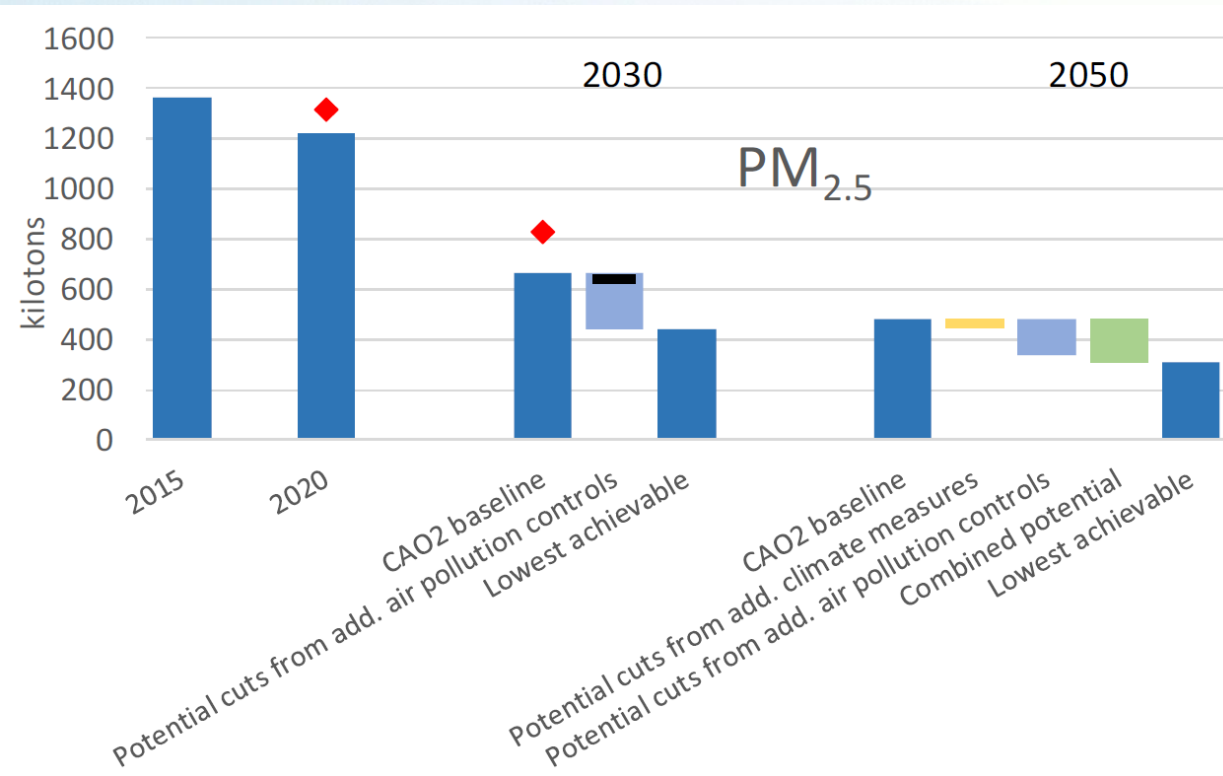




Second Clean Air Outlook (CAO2)

- Assesses prospects for achieving the objectives of the NECD for 2030 and beyond considering National Air Pollution Control Programmes (NAPCP) and an increased level of ambition for fighting climate change.
- CAO2 baseline and scenario including NAPCPs communicated in 2019; about -40% GHGs for 2030
- Additional climate policy variants:
 - (i) EU 2050 climate strategy vision (net zero GHG by 2050)
 - (ii) European Green Deal (-55% GHGs in 2030)

Published in January 2021: https://ec.europa.eu/environment/air/clean_air/outlook.htm

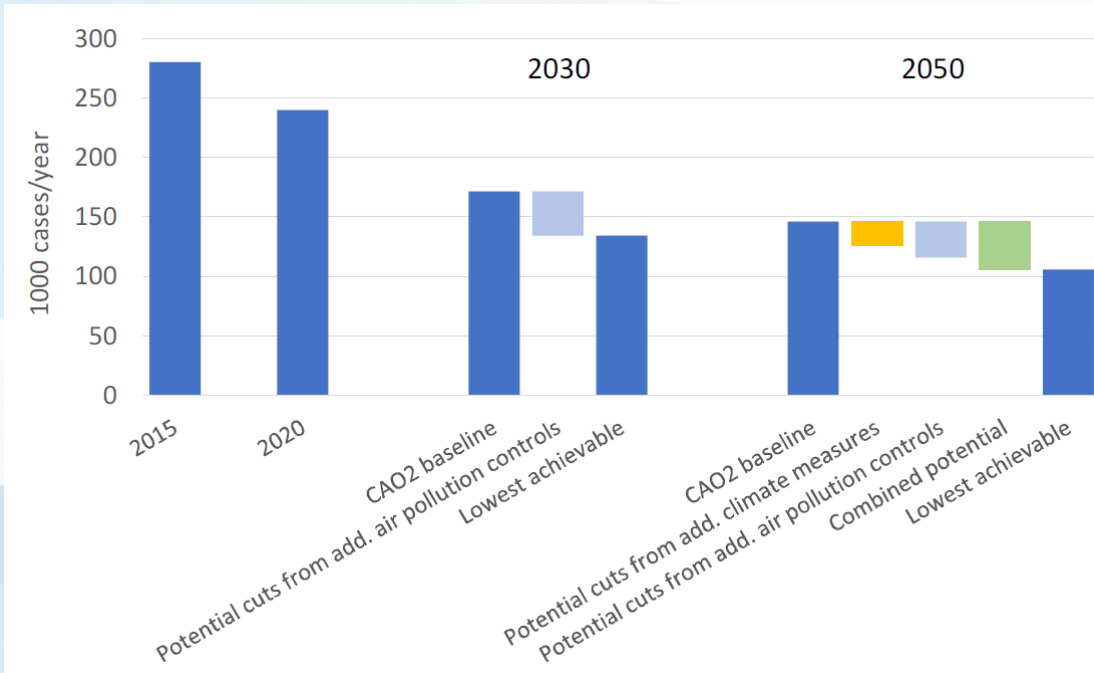
Emission projections for selected air pollutants under various scenarios for EU-27



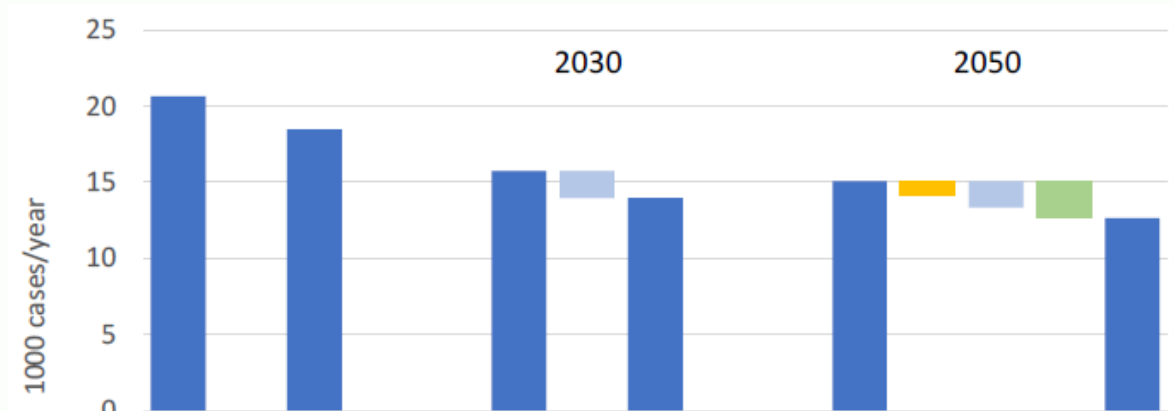
 : maximum emissions allowed under the NEC Directive
 : level of emission reduction achieved with the Additional Measures announced in the NAPCP

Cases of premature deaths attributable to the exposure to PM_{2.5}, ozone, and area of terrestrial ecosystems where N deposition exceed the critical loads for eutrophication, EU-27

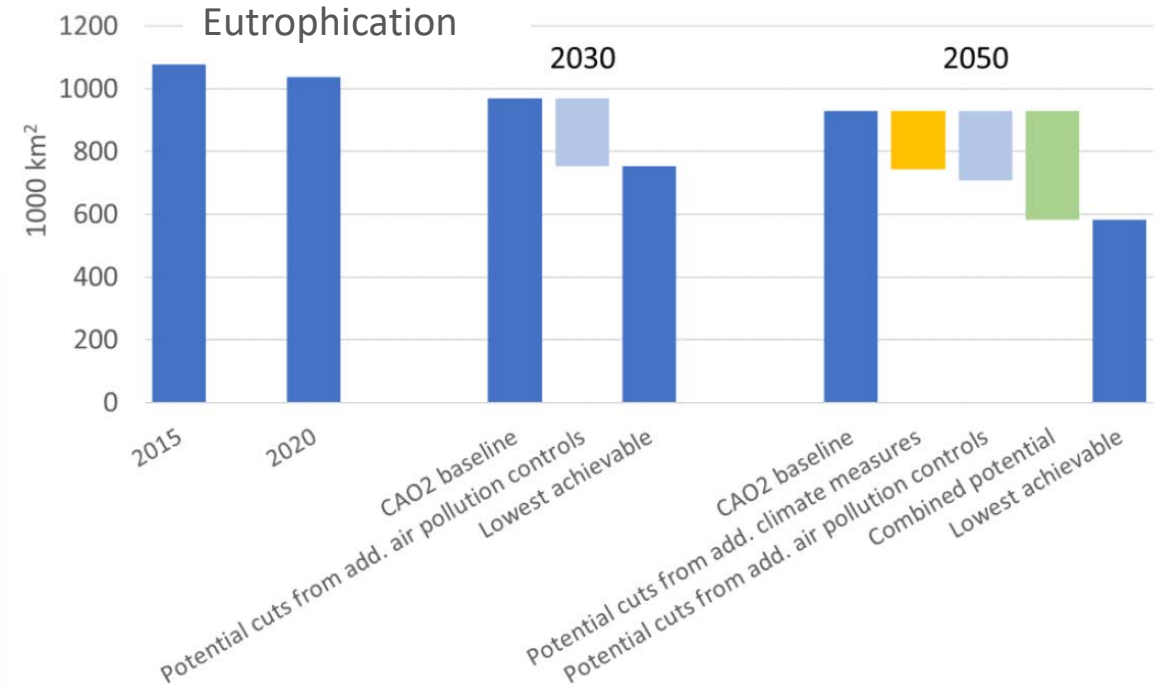
Premature deaths - PM



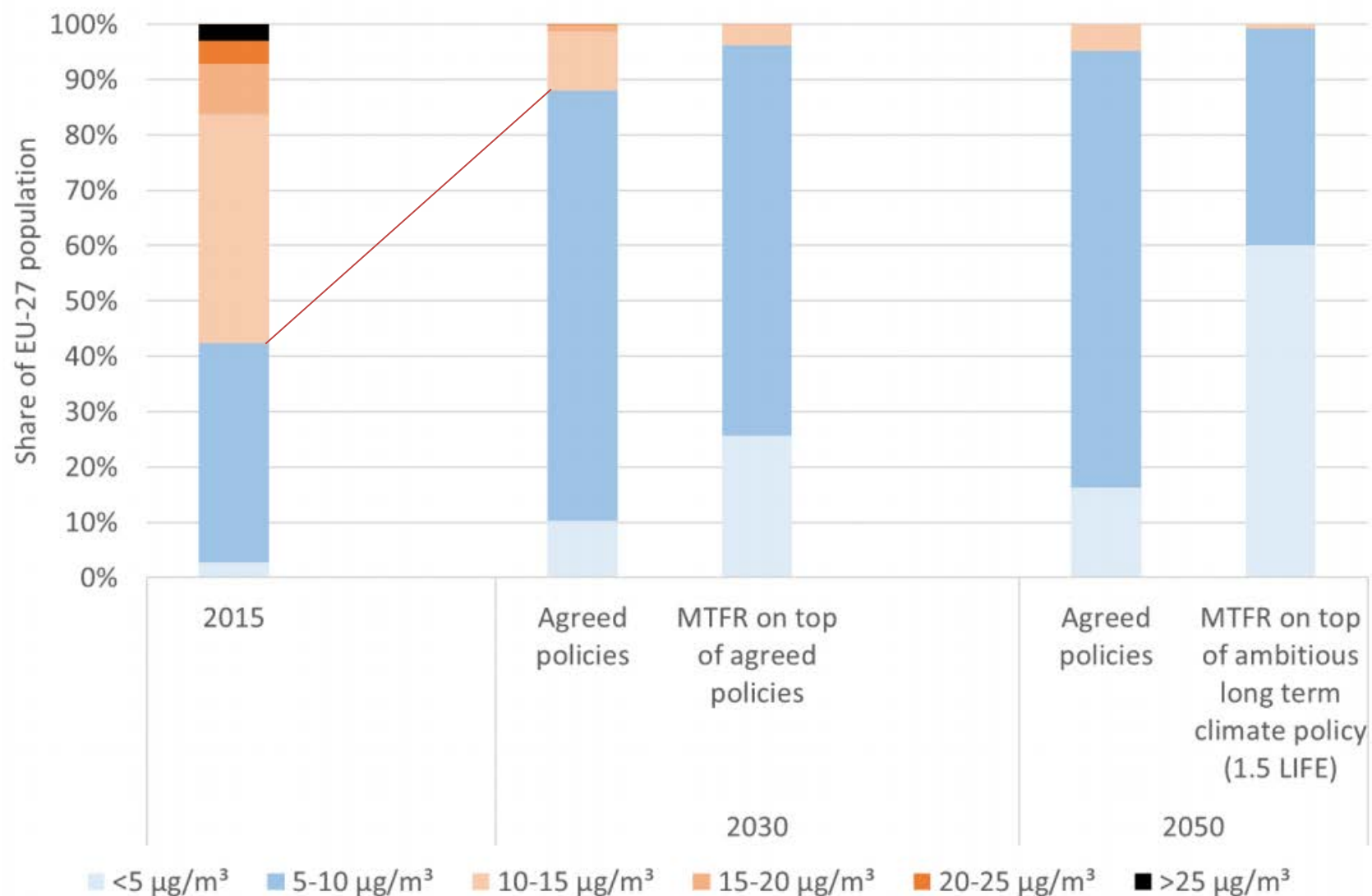
Premature deaths - ozone



Eutrophication



Distribution of population exposure to PM2.5 for key scenarios, EU-27

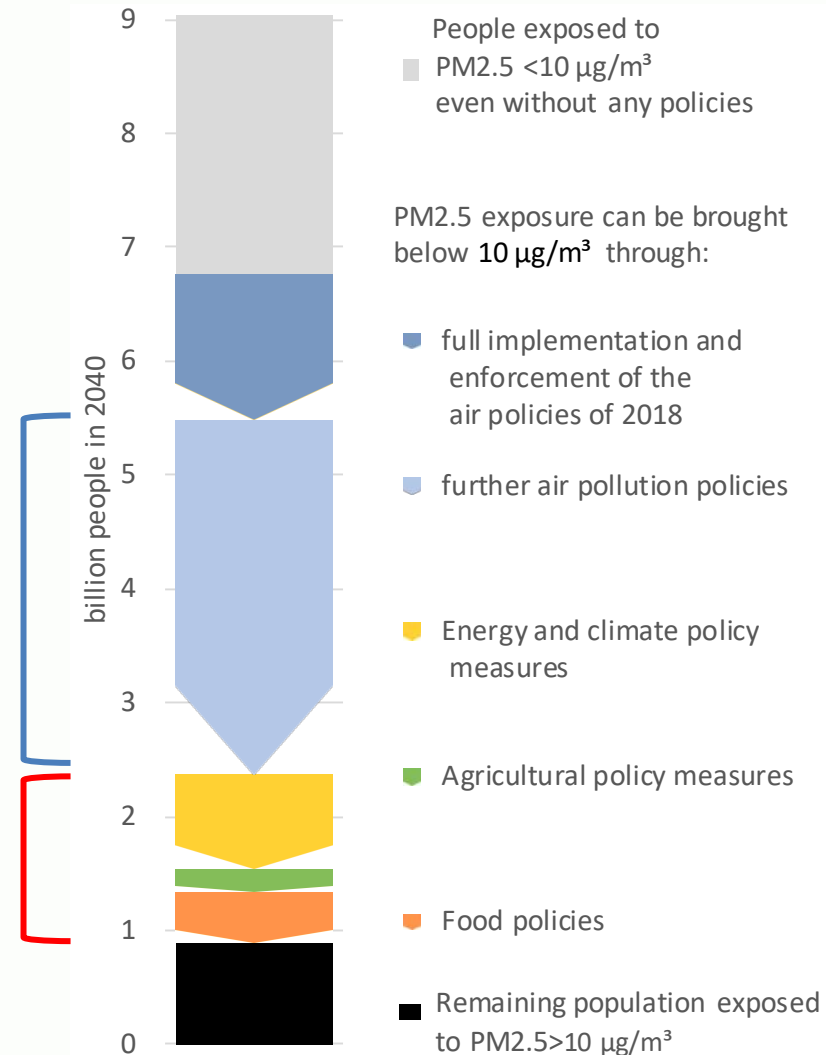


Source: GAINS model (IIASA), Second Clean Air Outlook (2020)

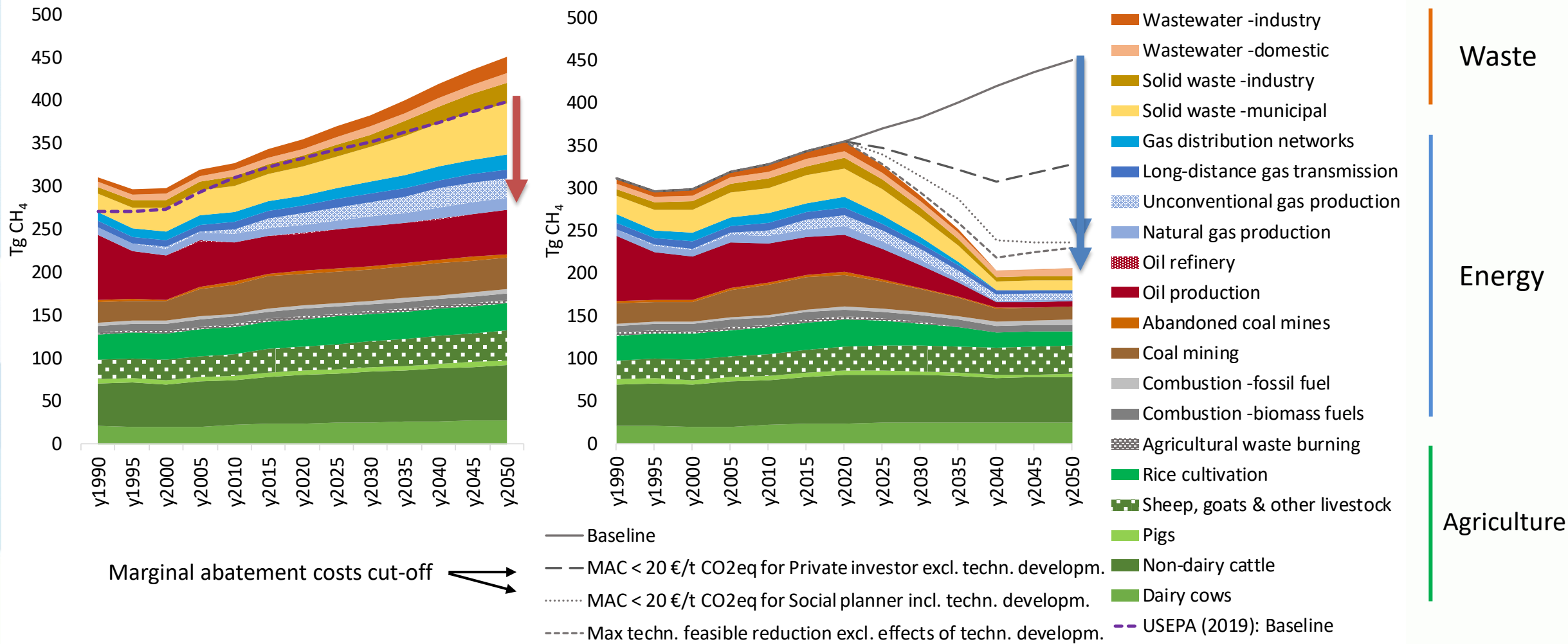
Global Perspective: Moving towards the WHO air quality guideline requires a mix of policies

- No single policy field alone can exhaust the full potential for air quality improvements
 - About 2/3 of the potential improvements can be delivered by further air quality policies
 - The remaining 1/3 is connected to other policy fields, including
 - energy and climate policies,
 - food policies,
 - agricultural policies.
- Achieving clean air requires integrated multi-sectoral policy approaches
- **Multi-sectoral solutions to achieve clean air will deliver a wide range of benefits on multiple development priorities (SDGs)**
- **A role for the Global Forum on Air Pollution that has been launched by the Air Convention in Dec 2019!**

Population exposed to PM_{2.5} < 10 µg/m³ from anthropogenic sources in 2040



Global anthropogenic CH₄ emissions 1990-2050

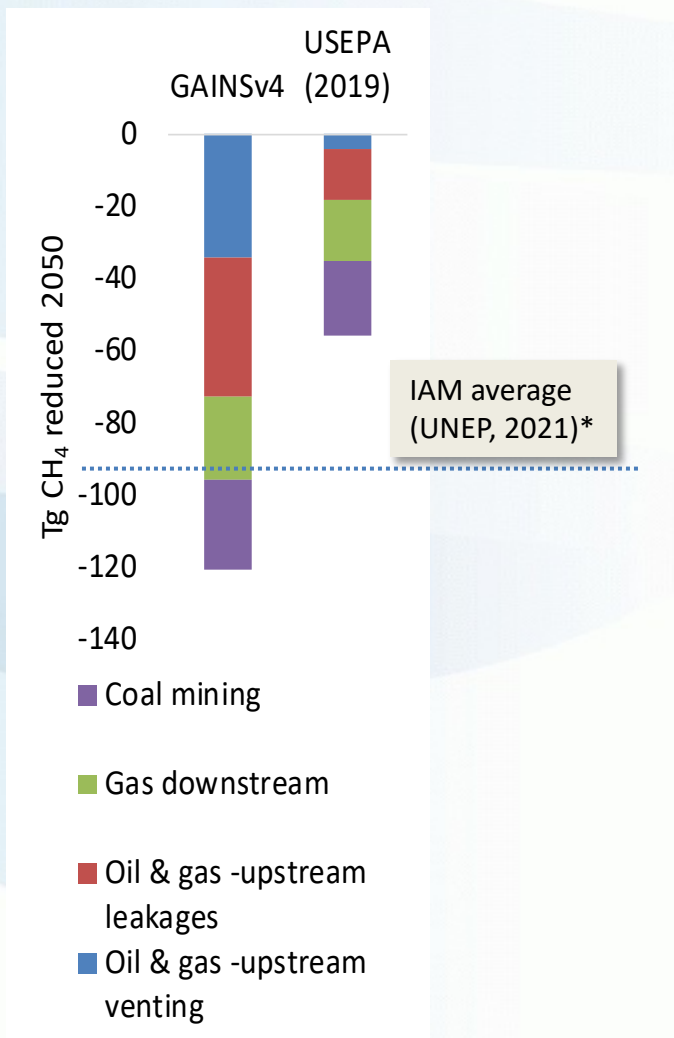


Max technical feasible reduction: ~120 (US-EPA-2019) to ~245 (GAINsv4) Tg CH₄

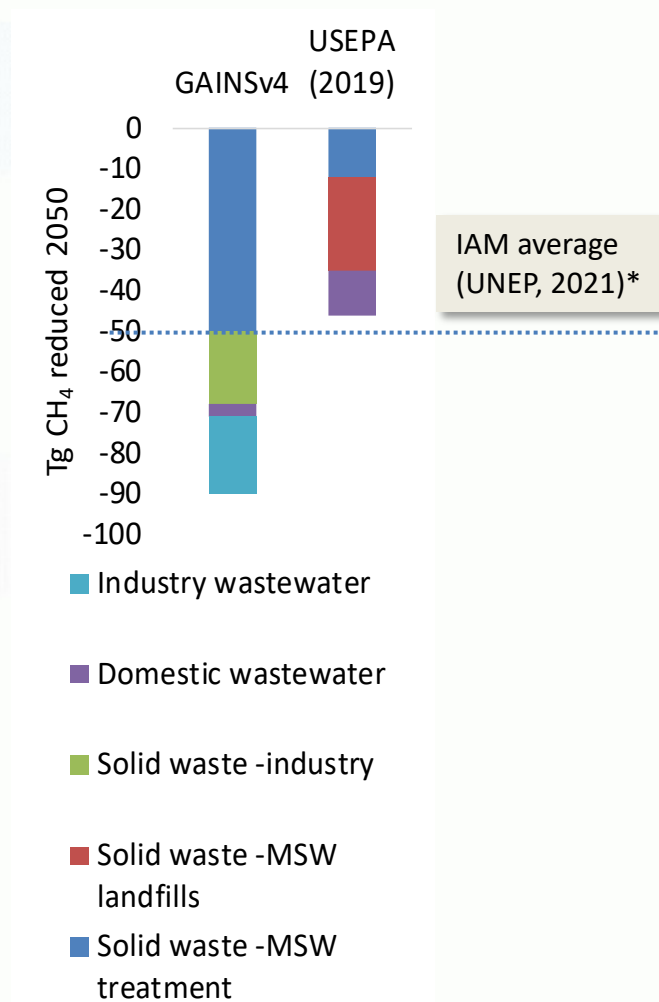
Global CH₄ mitigation potential estimates – 2050

(estimates of mitigation potential for 2030 are quite similar)

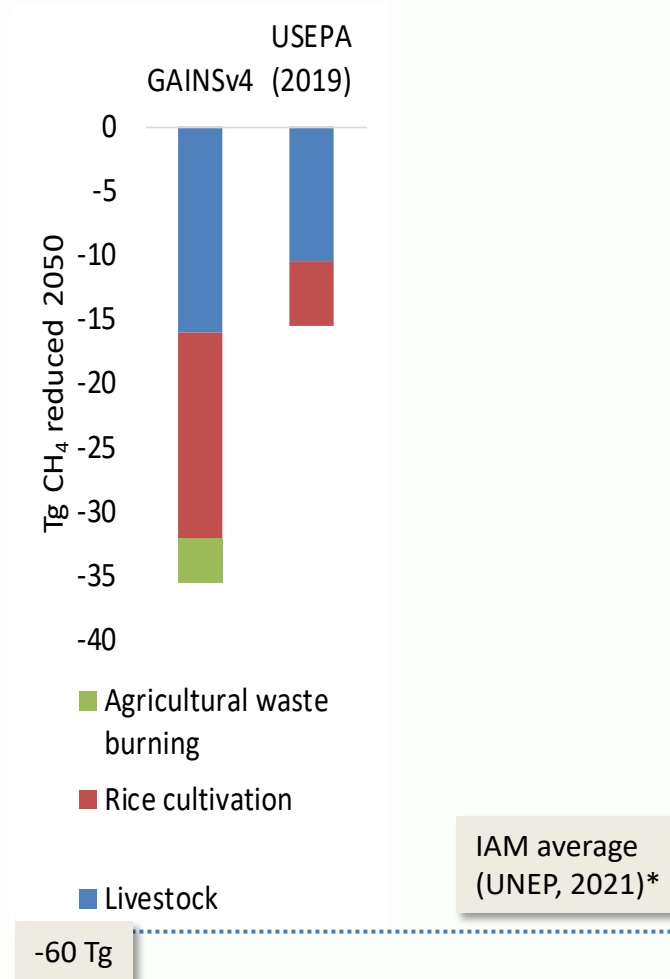
Energy



Solid waste and wastewater



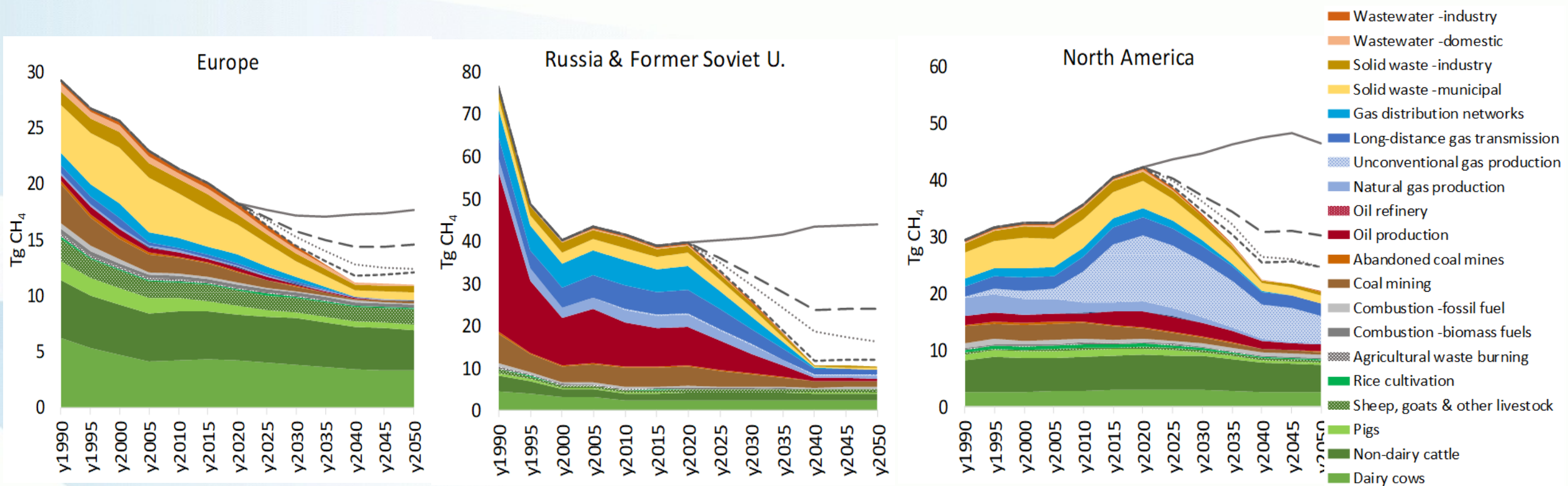
Agriculture



* Global Methane Assessment (UNEP, 2021)

Source: GAINsv4; Höglund-Isaksson et al., 2020 (<https://doi.org/10.1088/2515-7620/ab7457>)

Large regional variation in sectoral emissions and mitigation potentials

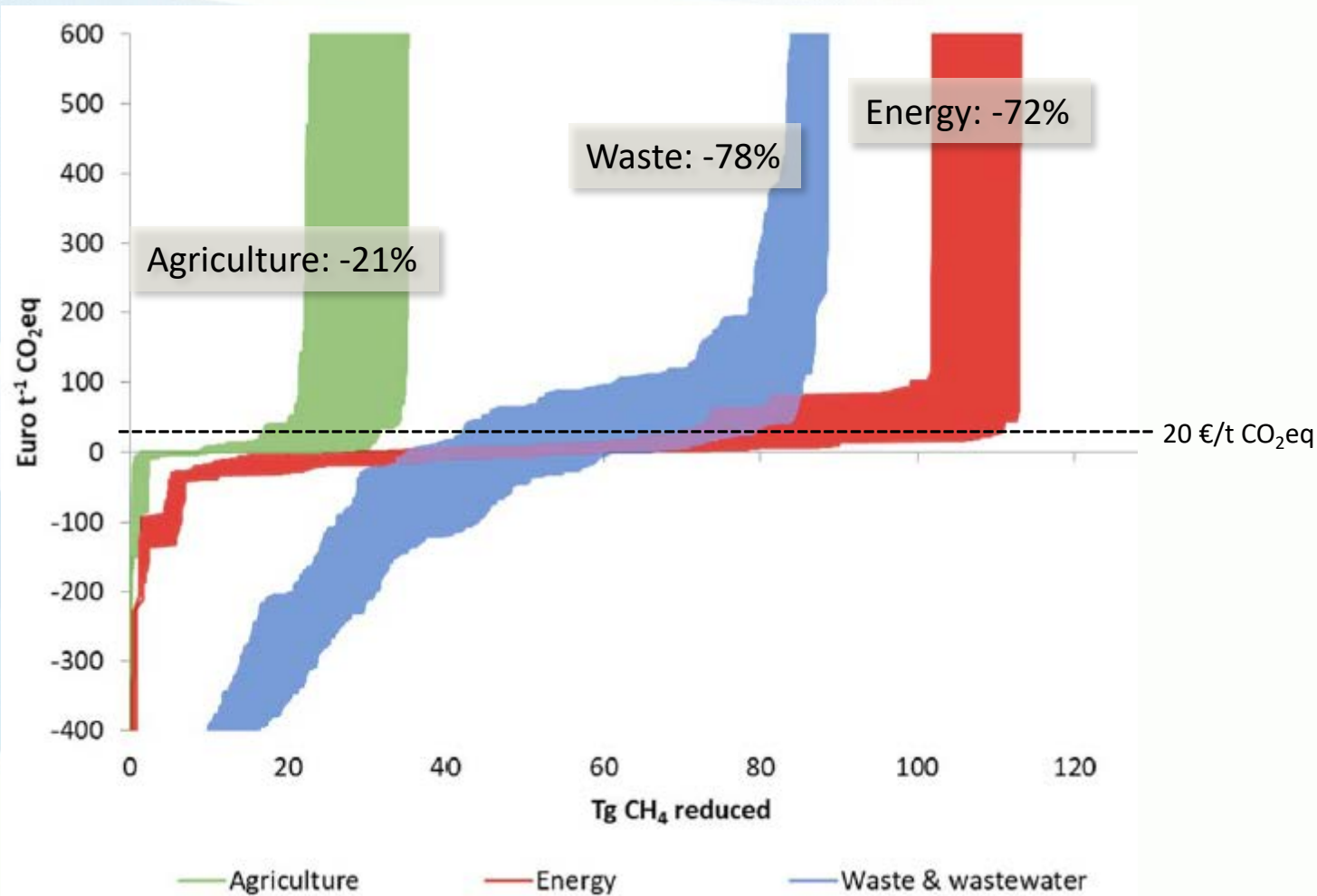


Marginal abatement costs cut-off

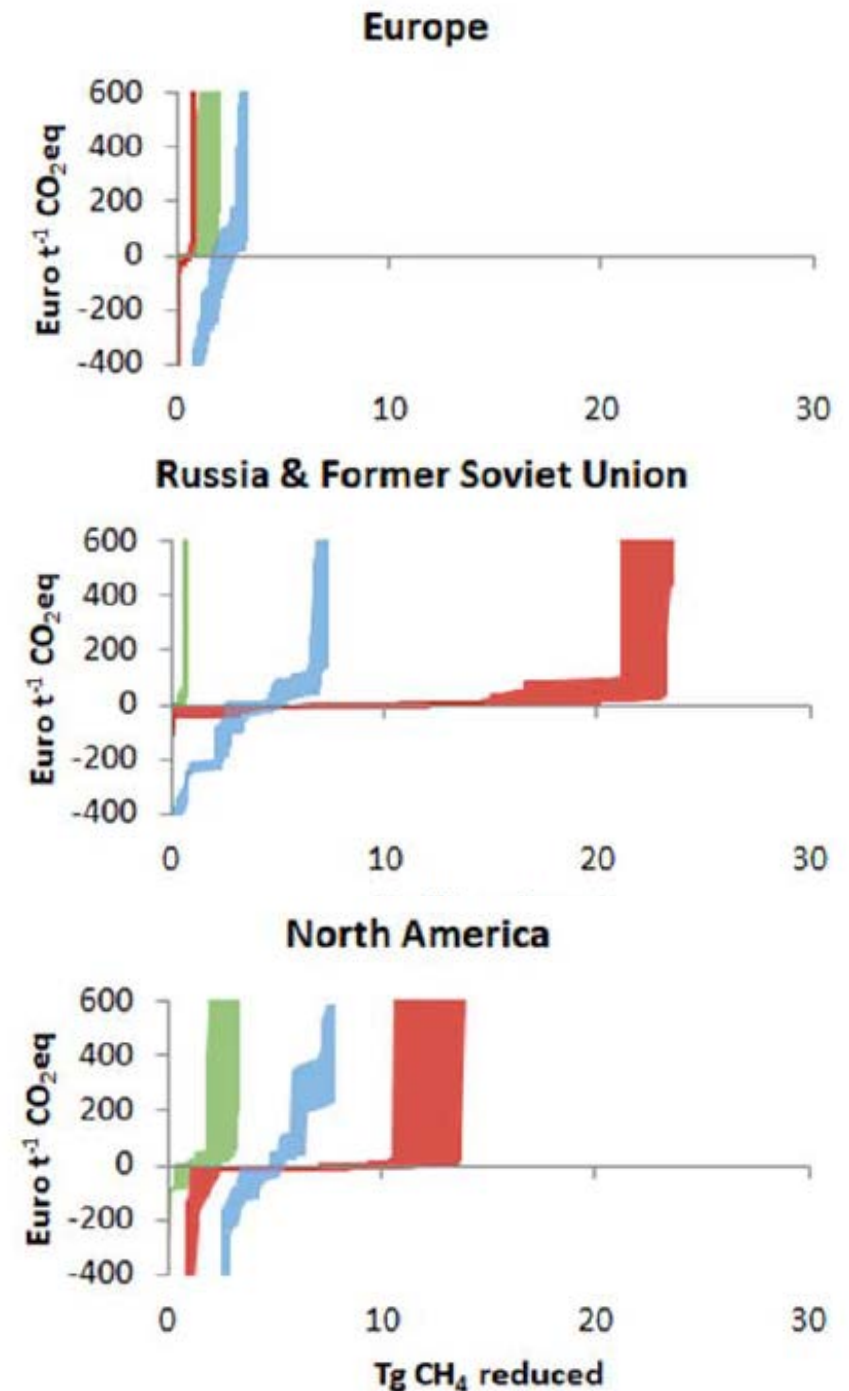


- Baseline
- - - MAC < 20 €/t CO₂eq for Private investor excl. techn. developm.
- MAC < 20 €/t CO₂eq for Social planner incl. techn. developm.
- - - - Max techn. feasible reduction excl. effects of techn. developm.

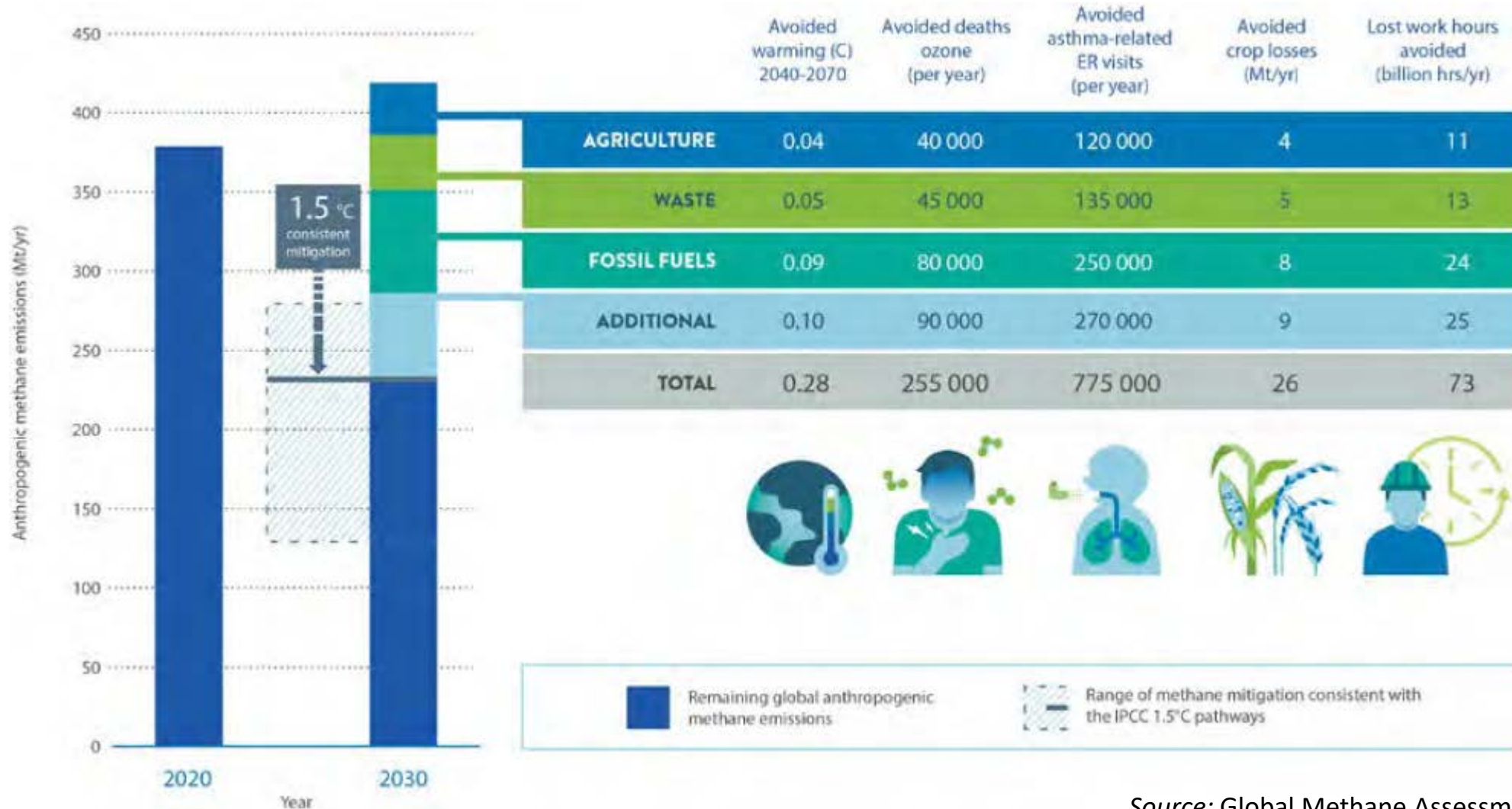
Marginal abatement cost curves (ranges*) for global and regional CH₄ mitigation in 2050



* Ranges reflect private sector (upper) and social planner (lower) investment perspectives as well as inclusion of technological progress/development



Anthropogenic emissions of CH₄, mitigation potential and several benefits (UNEP, 2021)



Source: Global Methane Assessment (UNEP, 2021)

Summary

- NH_3 remains the most challenging pollutant for the achievement of the reduction commitments.
- The increased ambition of European climate policies leads to important reductions of energy-related air pollutants and thereby reduces the pressure on other sectors for reaching compliance with the NECD reduction commitments – but not for NH_3 .
- Local and regional analysis reconfirms the relevance of the international component of air pollution and reveals the importance of (past and future) regionally coordinated policies
- A mix of policies (involving air quality, climate, and SDGs) needed to achieve WHO air quality guideline targets
- Important role for methane in climate mitigation providing several (and significant) co-benefits on health, crops and ecosystems
- Low-cost mitigation of methane available and provides a cost-effective way of reducing background ozone