

Clean Air Outlook: the prospects for EU air quality for 2030 and beyond

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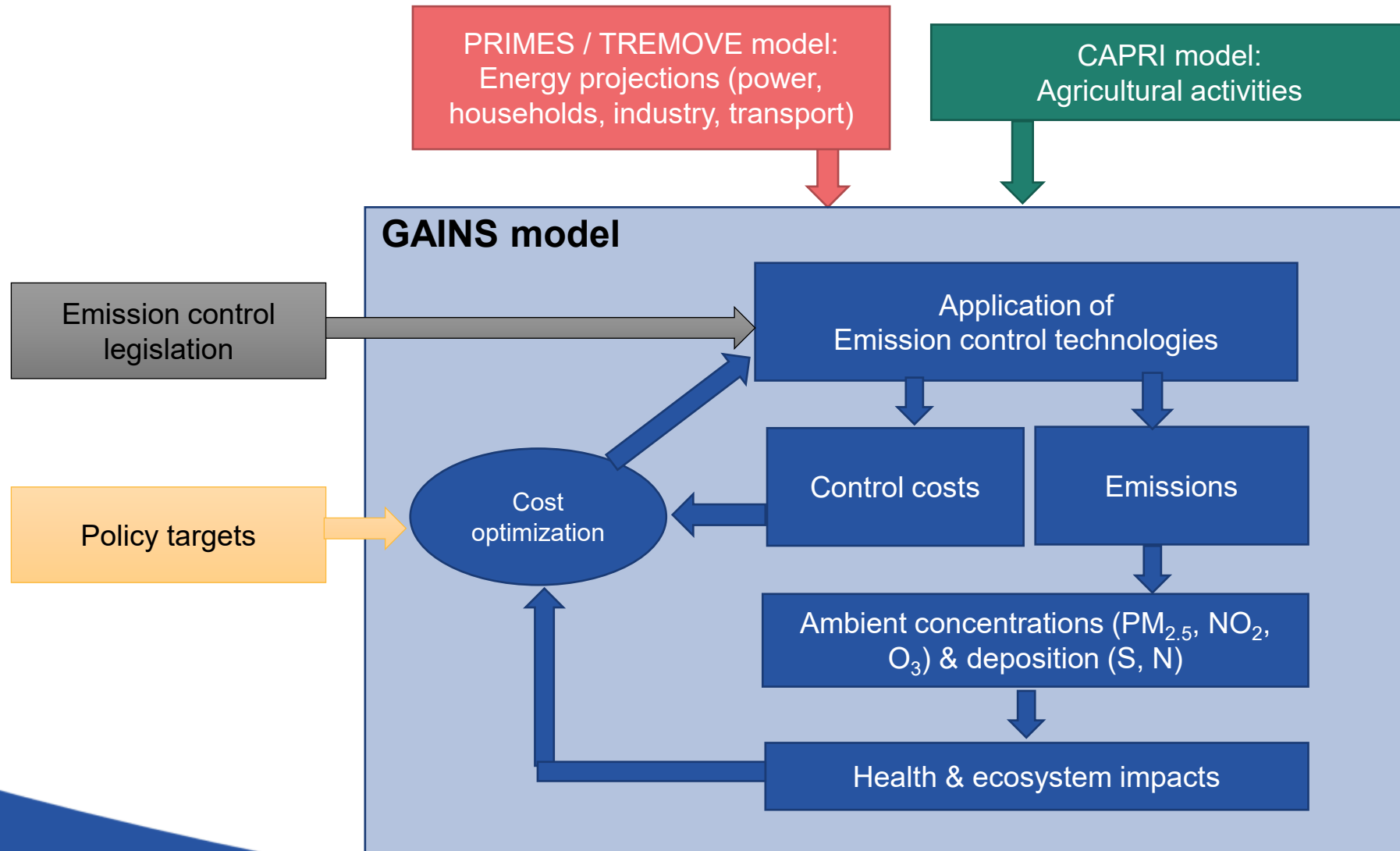
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*Clean Air in Europe for All
Brussels, 24 May 2023*

The European Commission's 3rd Clean Air Outlook

- Clean Air Outlook: Series of reports outlining possible futures of emissions and health / environmental impacts of air pollution in the EU
- Checking progress and likely attainment of National Emission Reduction Commitments (NEC directive)
- The 3rd Clean Air Outlook was published in December 2022 (COM (2022) 673 and IIASA Support Study, available online [here](#))
- Emission scenarios analysed were updated from the AAQD Impact Assessment
 - consultations with Member States to discuss emissions and implementation of policies
 - systematic update of soil NO_x emissions from agriculture
 - proposal for revision of the IED for agriculture is included in CAO3
- Expanded beyond the set of scenarios analysed for AAQD Impact Assessment
- Slightly different setup of the modelling in CAO3 compared to AAQD Impact Assessment
 - Main findings confirmed

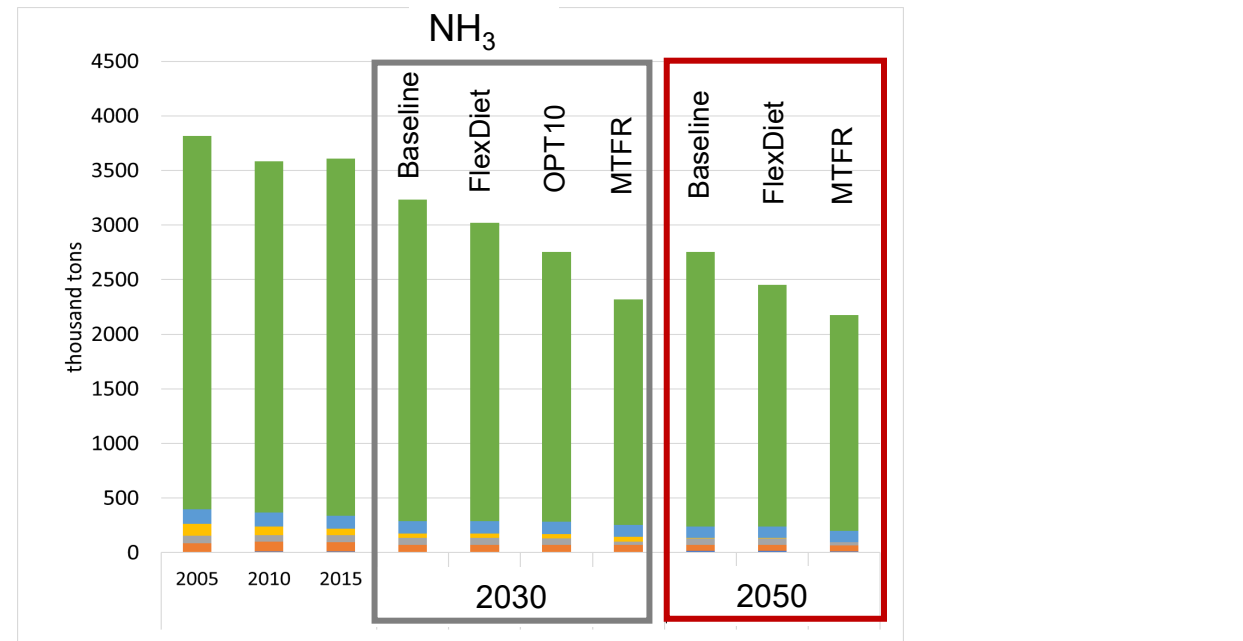
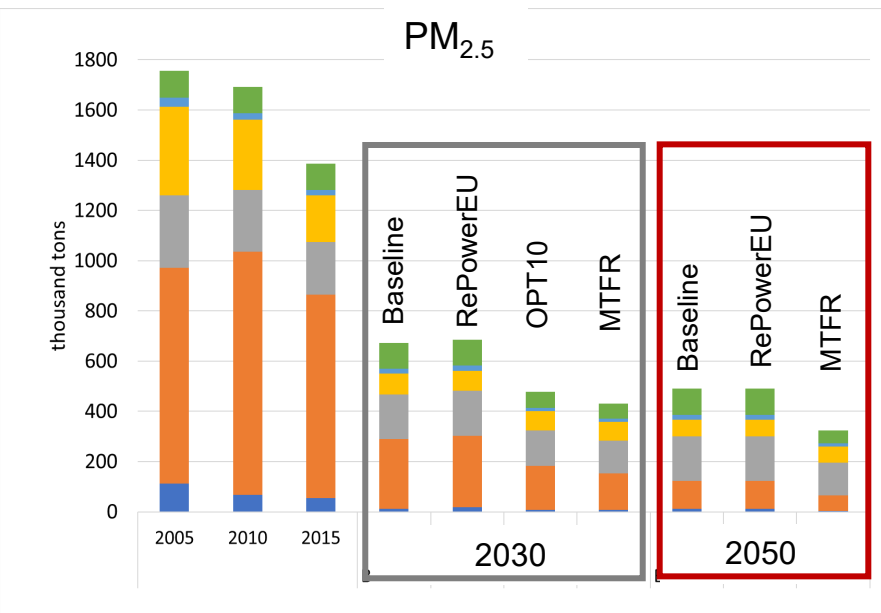
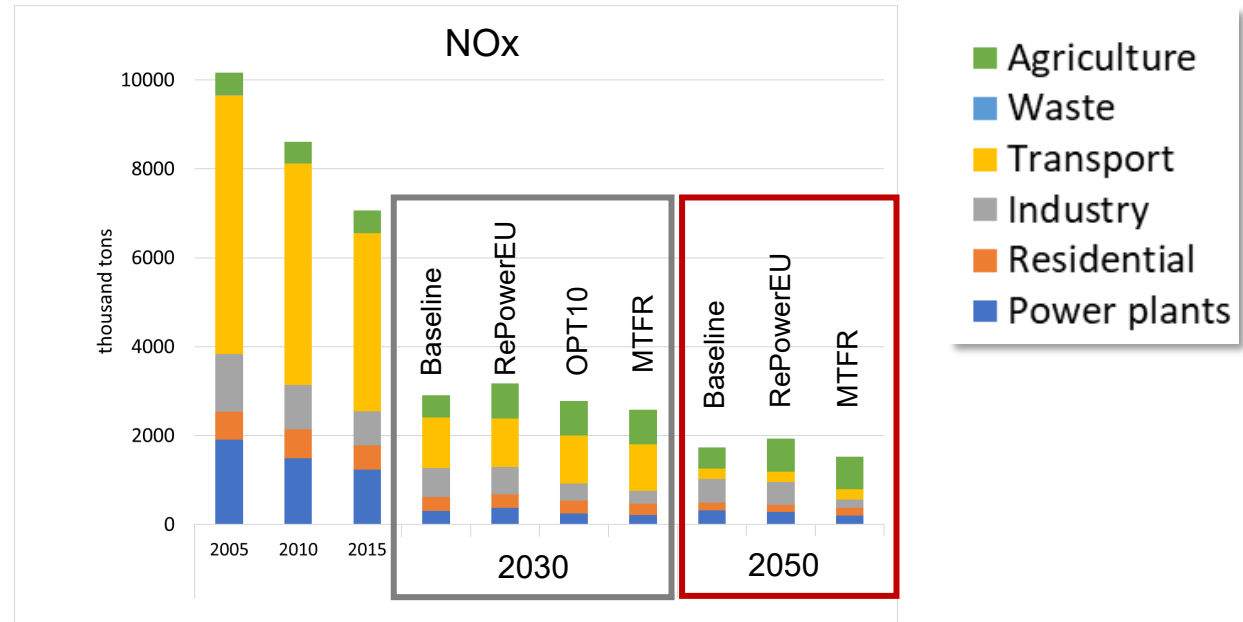
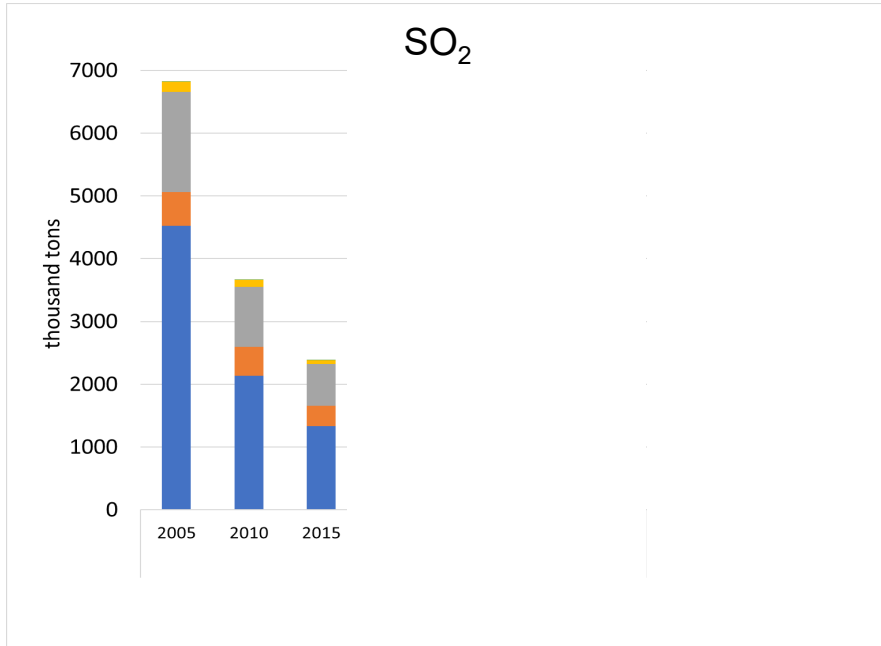
Modelling framework



Scenarios

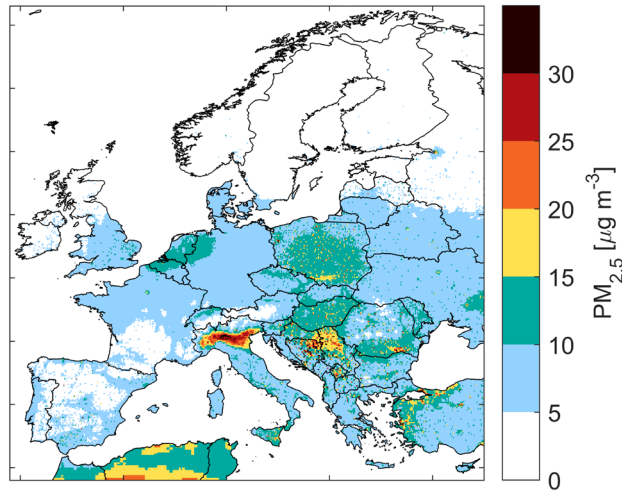
- **Baseline**
 - Review of the recent policies and measures and national implementation progress and plans
 - Energy, industry, and agriculture for the EU – Green Deal (Fit for 55)
- **Alternative baseline: RePowerEU**
 - Changed energy pathway due to war in Ukraine (reduced reliance on gas, extended use of renewable and solid fuels)
- **Cost-optimal scenario targeting $10\mu\text{g}/\text{m}^3$ (AAQD proposal)**
- **Maximum technically feasible reductions (MTFR)**
 - Best available emission control technologies are applied to the extent possible (irrespective of costs)
- **FlexDiet**
 - Dietary shifts towards less meat consumption
 - Changed agricultural activities

Emission projections

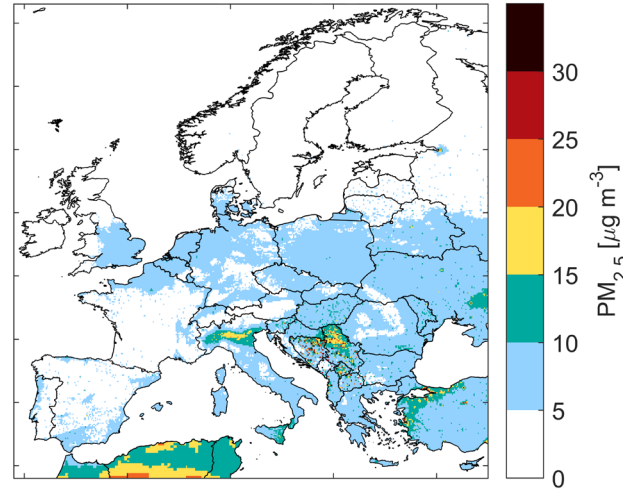


Ambient PM_{2.5} concentrations

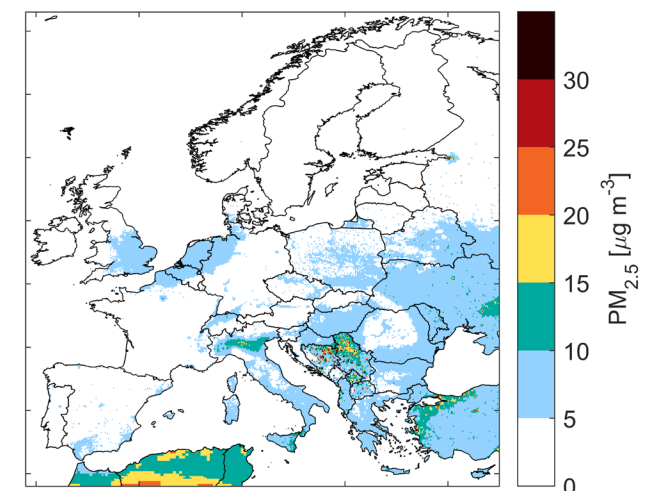
2020



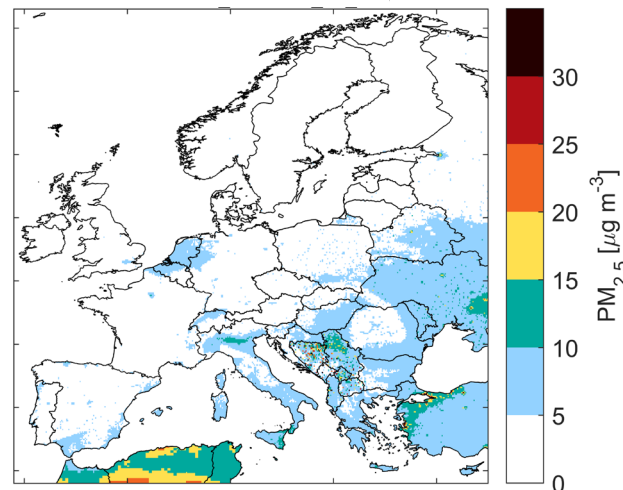
2030 Baseline



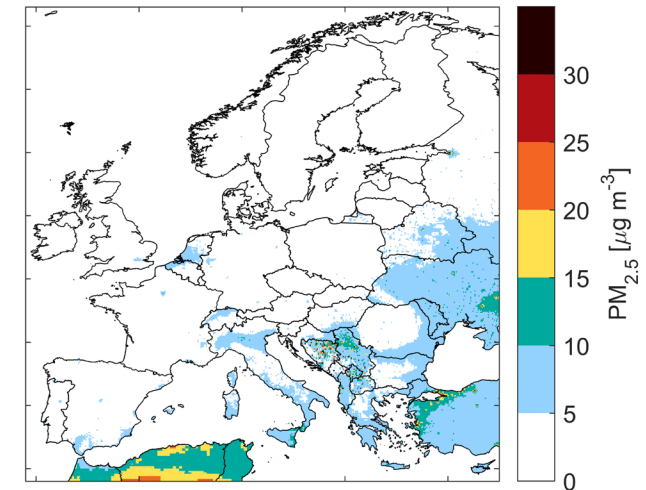
2030 MTR



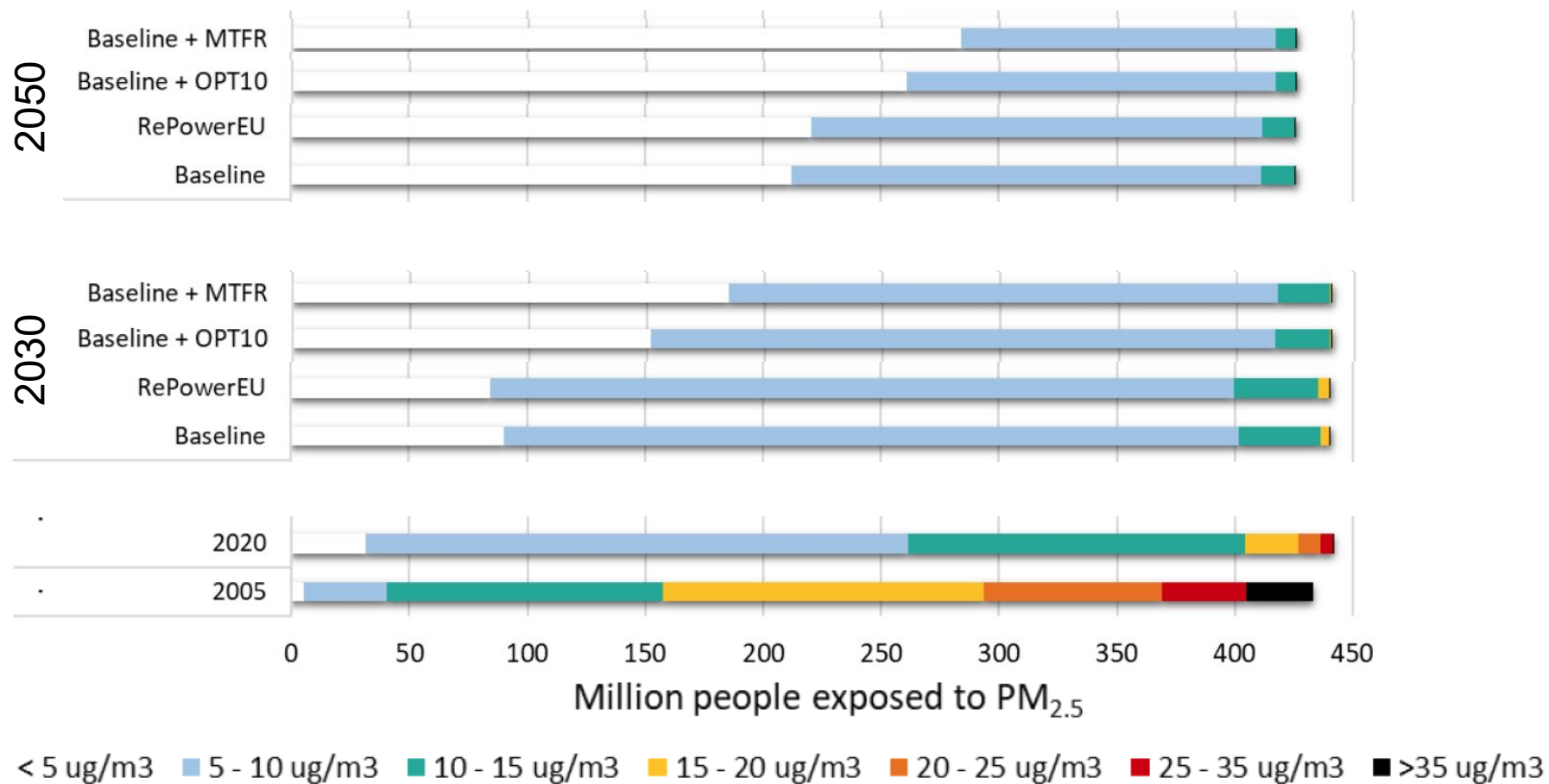
2050 Baseline



2050 MTR

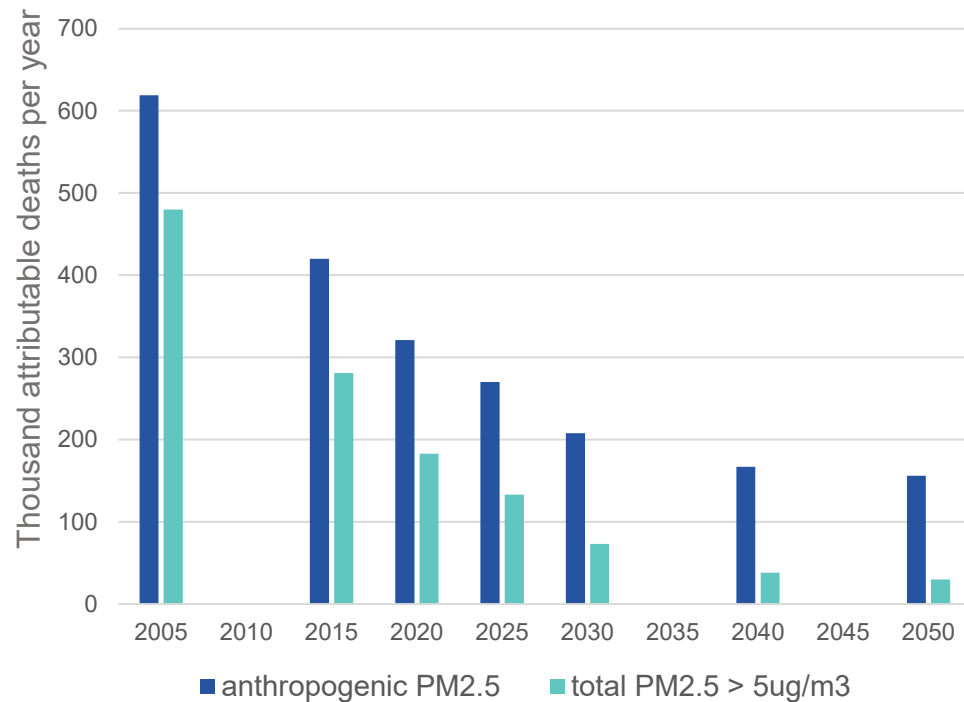


Population exposure to PM_{2.5}

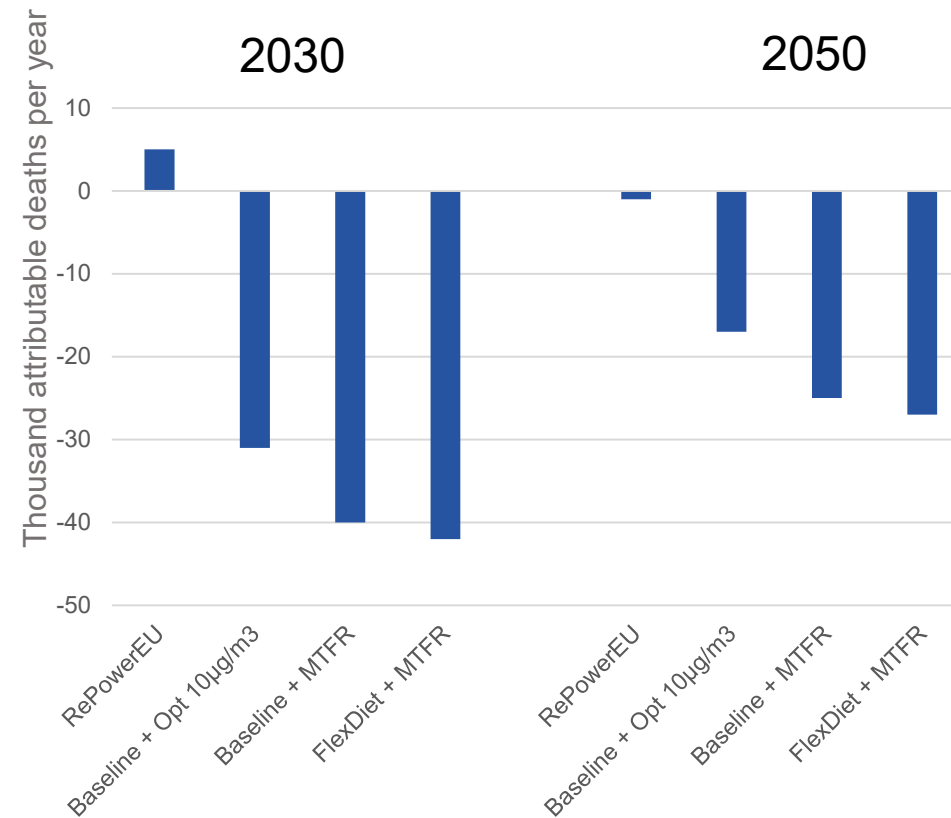


Health impacts from PM_{2.5}: mortality

Attributable deaths (EU): Baseline



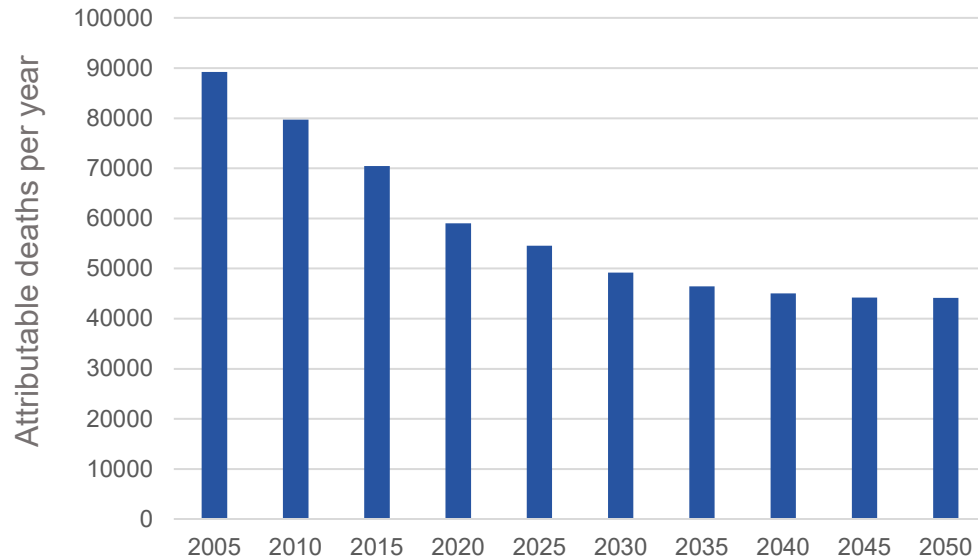
Avoided premature deaths, compared to Baseline



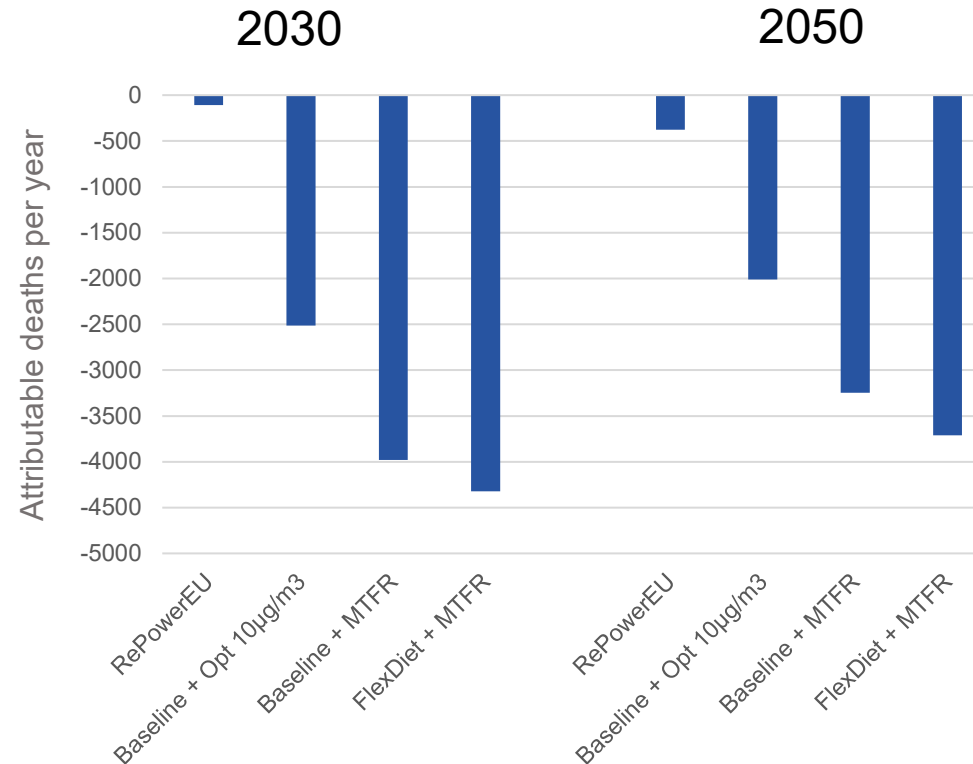
Concentration-response functions: Chen & Hoek (2020).
Constant 2010 population data for comparability over time.

Health impacts from O₃: mortality

Attributable deaths from O₃: Baseline



Avoided premature deaths, compared to Baseline

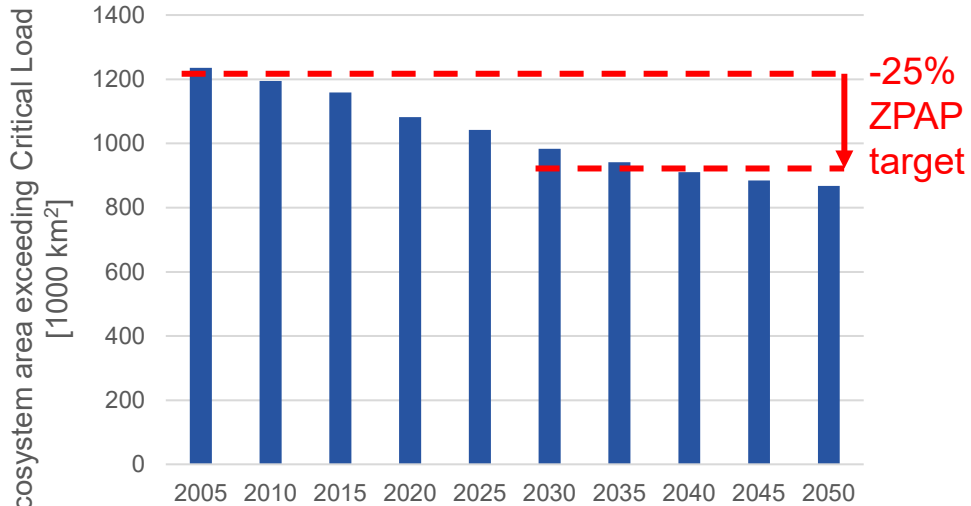


Exposure metric: SOMO35

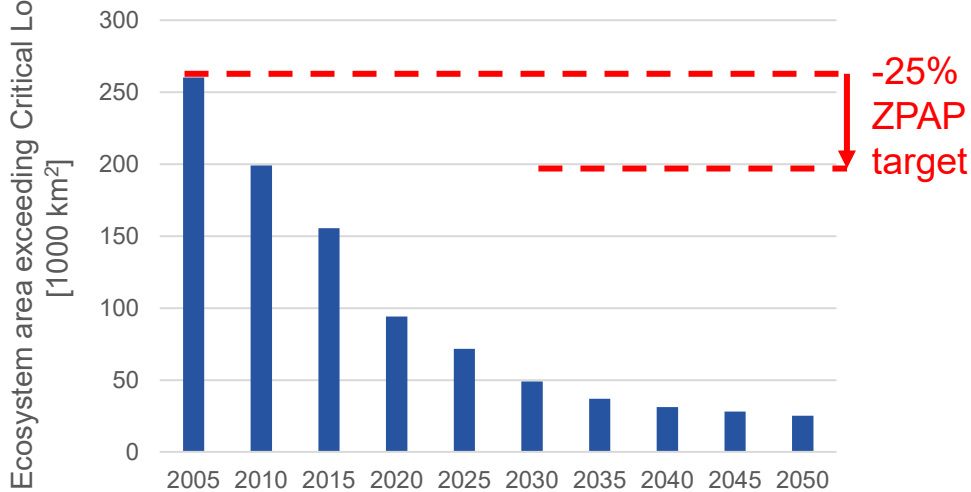
Concentration-response function: Huangfu & Atkinson (2020)

Other impacts: ecosystems

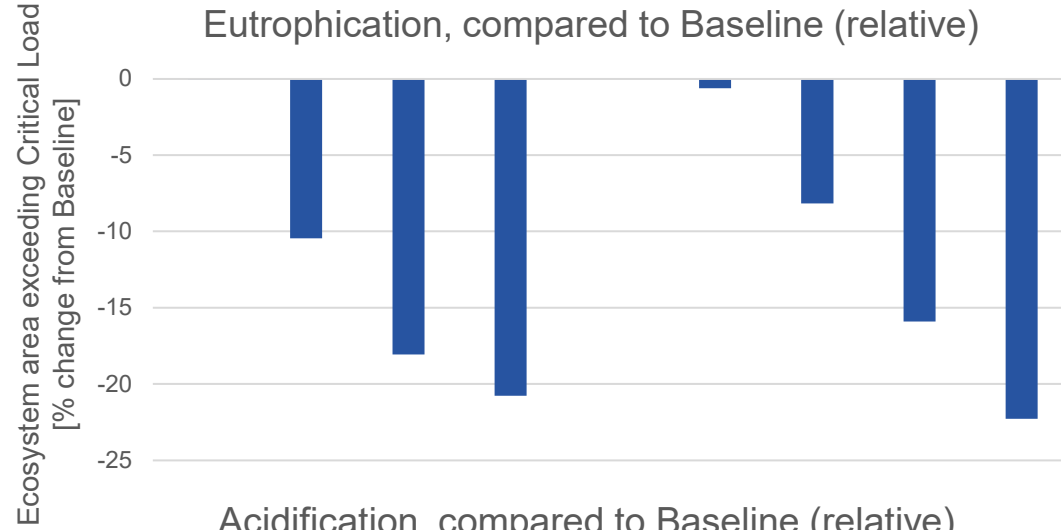
Eutrophication: Baseline



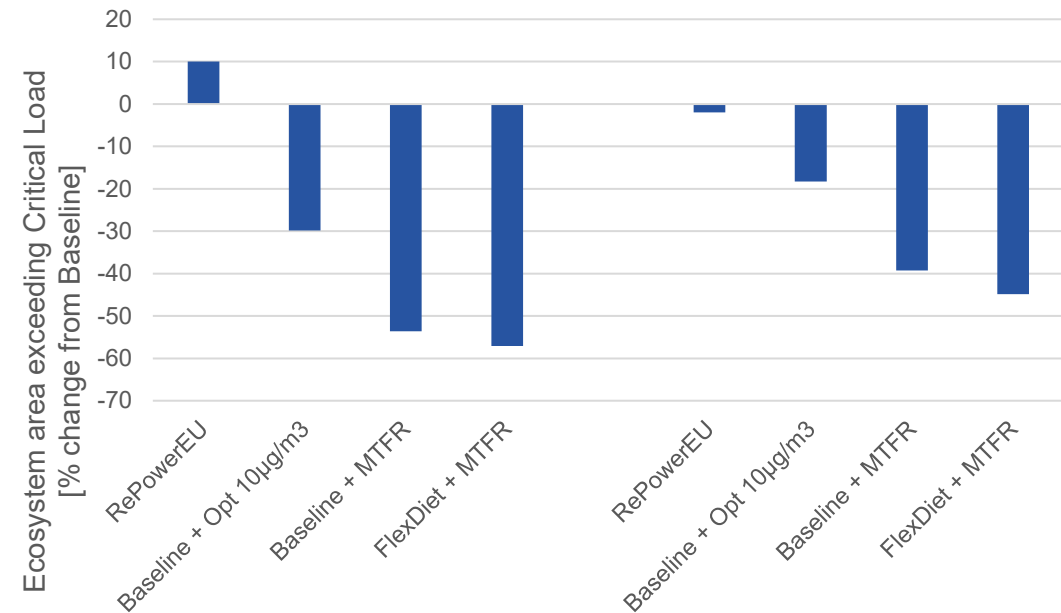
Acidification: Baseline



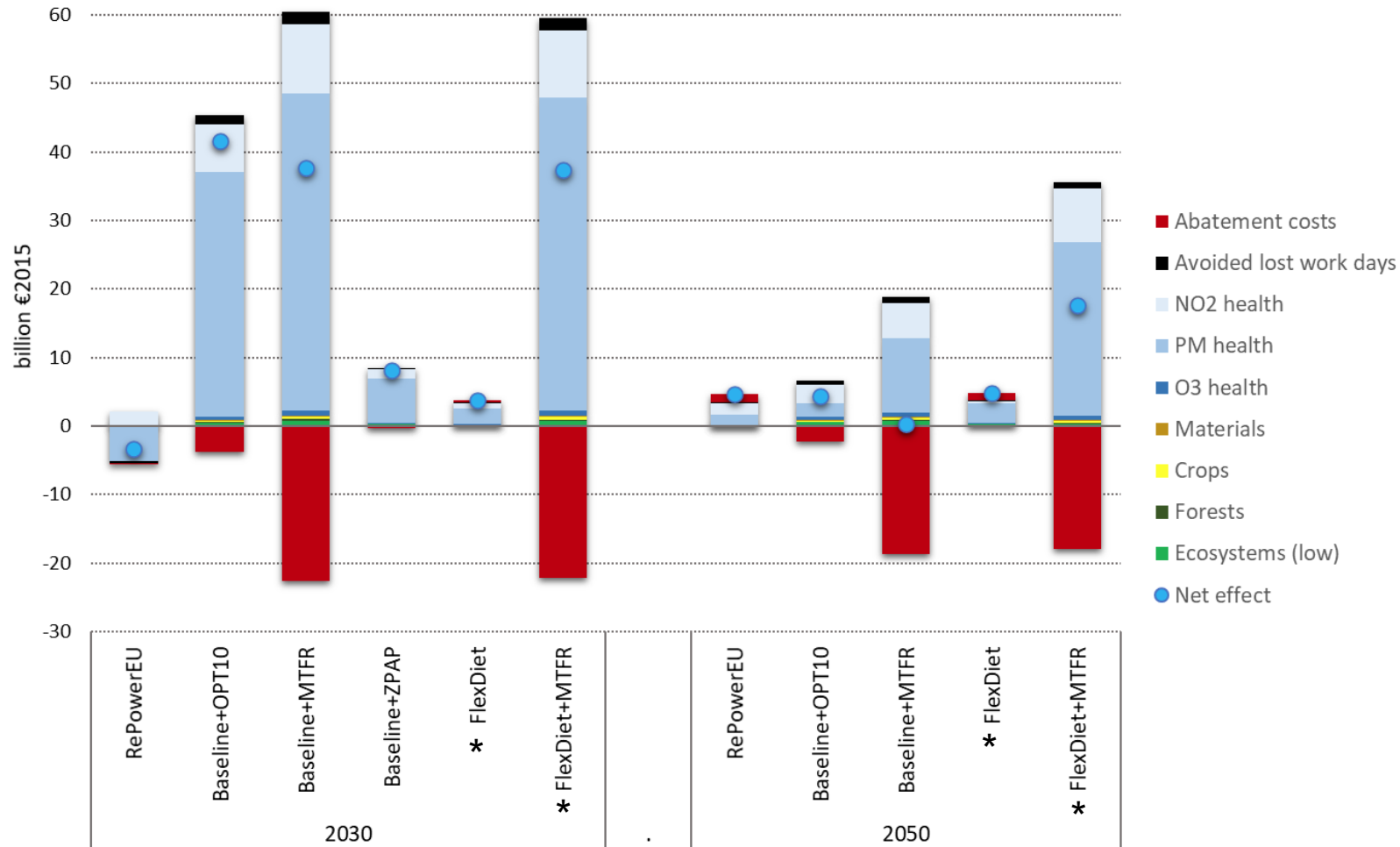
Eutrophication, compared to Baseline (relative)



Acidification, compared to Baseline (relative)



Cost-benefit analysis



* only ambient air pollution included in benefits analysis – not diet!

Summary

- Scenarios developed for the Clean Air Outlook 3 are updated from the AAQD Impact Assessment and explore a few more variants
- **Baseline**: Substantial decreases of emissions. But WHO Guideline exceeded in large areas
- **RePowerEU**: Slightly higher than Baseline in the short term due to increased use of solid fuels
- Potential exists for mitigation through technical measures:
 - **OPT10** scenario aims to achieve the proposed PM_{2.5} limit value in a cost-optimal way
 - The **MTFR scenario** explores full implementation of all available technical measures
- There are clear health and ecosystem benefits of further mitigation measures which outweigh the costs
- National-level technical measures may not be enough to achieve the proposed AAQD limit values everywhere – local measures needed in hot spot areas (and/or behavioural changes)

Difference in PM_{2.5} due to RePowerEU vs Baseline

