

CIAM scenarios supporting the GP revision

Updated scenarios and feasibility of indicative health and ecosystem targets

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Informal delegations meeting, Leuven, 21-24 Oct 2024

Updating scenarios for GP revision

- Development of updated *Baseline*, *MTFR*, and *LOW* cases
- Further sensitivity and cost-effective policy scenarios
 - Achieving health targets
 - Inclusion of biodiversity targets
 - Ozone
- Modelling timeline

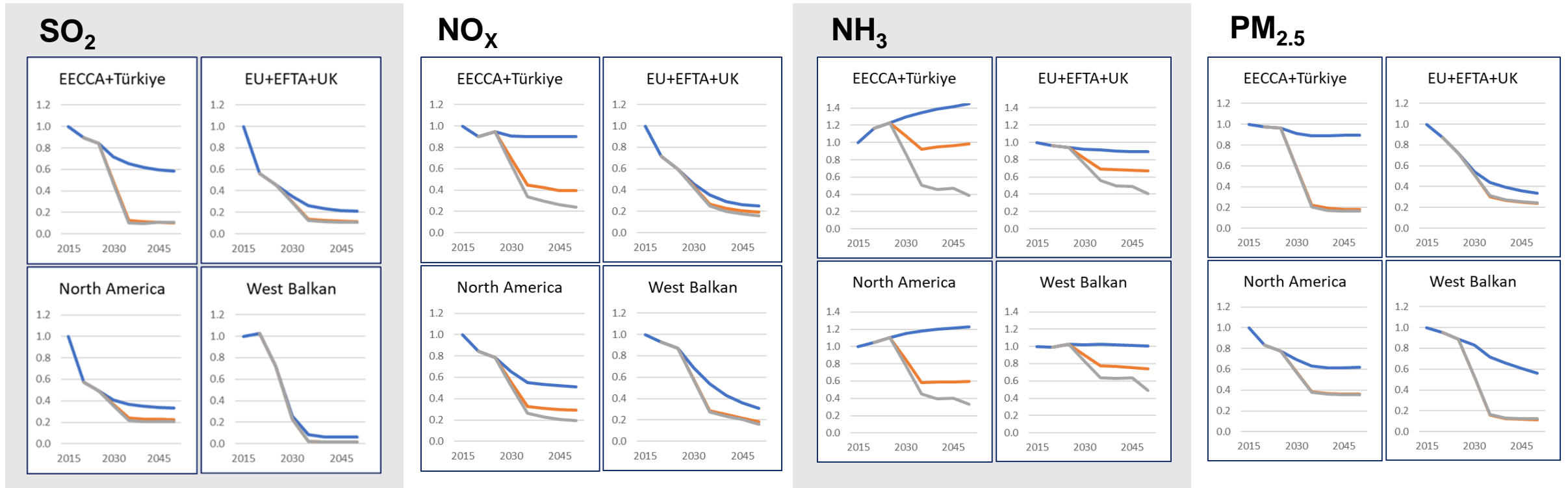
Development of updated Baseline for GP revision

- **Baseline** (*update compared to the scenario used for the GP review*)
 - **EU27** – European Green Deal, including Fit for 55 package, RePowerEU initiatives, revision of the IED, results of the MS consultation during Clean Air Outlook 4 (CAO4)
 - **West Balkan** – Using the same modelling tools as for EU, including decarbonization targets and compliance with the Energy Community agreements, consultations with all countries (EU4Green project)
 - Selected EECCA (**Moldova, Ukraine, Georgia**) using the same modelling tools as for EU, consultations with Moldova
 - **UK, Switzerland, Norway** – updates based on engagement in consultation meetings so far
 - **Remaining countries** – analysis of national submissions, reports, international statistics, projections updated based on recent IEA & FAO Outlooks

Development of scenarios for GP revision

- ***MTFR (Maximum Technical Feasible Reduction)***
 - Review of costs of control measures
 - Reassessment of applicability's (maximum penetration rates of a given measure for specific years), especially for the near term
- ***LOW (MTFR and transformation in energy and agriculture – behavioural changes)***
 - Currently not entirely consistent with the Baseline
 - Revisions ongoing considering more recent sustainable development scenarios and discussion about ambition level for dietary shifts
 - Revision needed for West Balkan and EECCA as the Baseline changes
- ***LOW+ (include further non-tech measures and ‘alternative’ projections)***
 - Initial discussion
 - Update needed to consider new developments (new fuels, hydrogen economy) – GAINS being updated but lack of respective driver scenarios yet

Emission trends across the UNECE region



LOW scenario is not entirely consistent for energy sources; work in progress

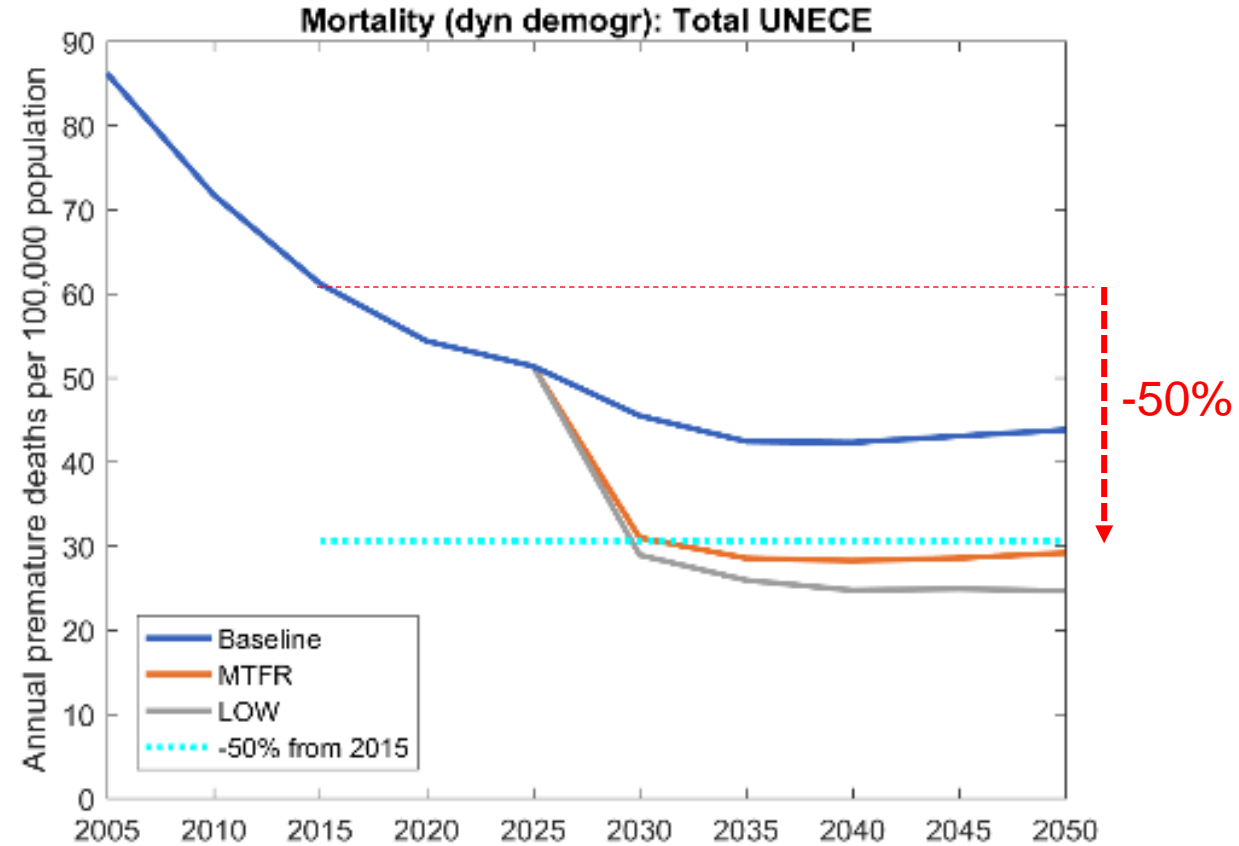
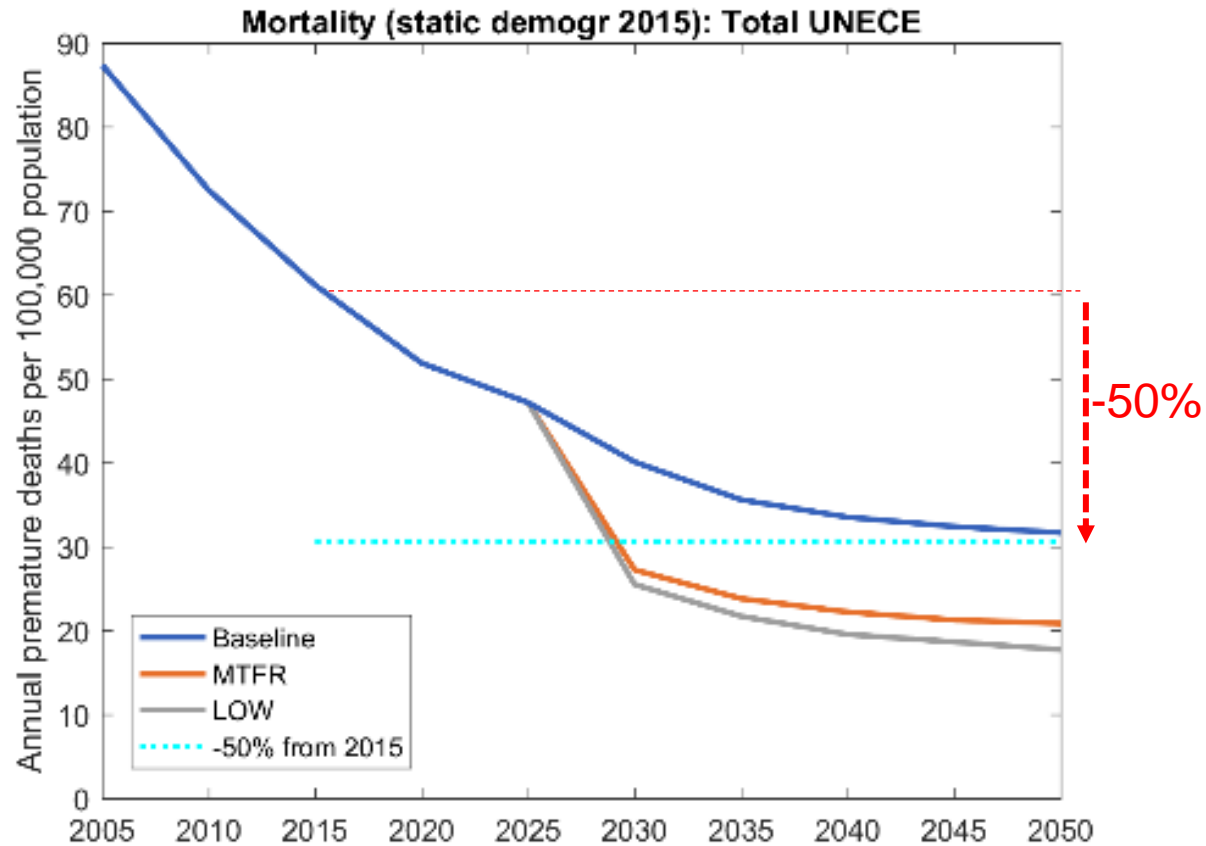
— Baseline — MFR — 'Low'

Updated feasibility analyses

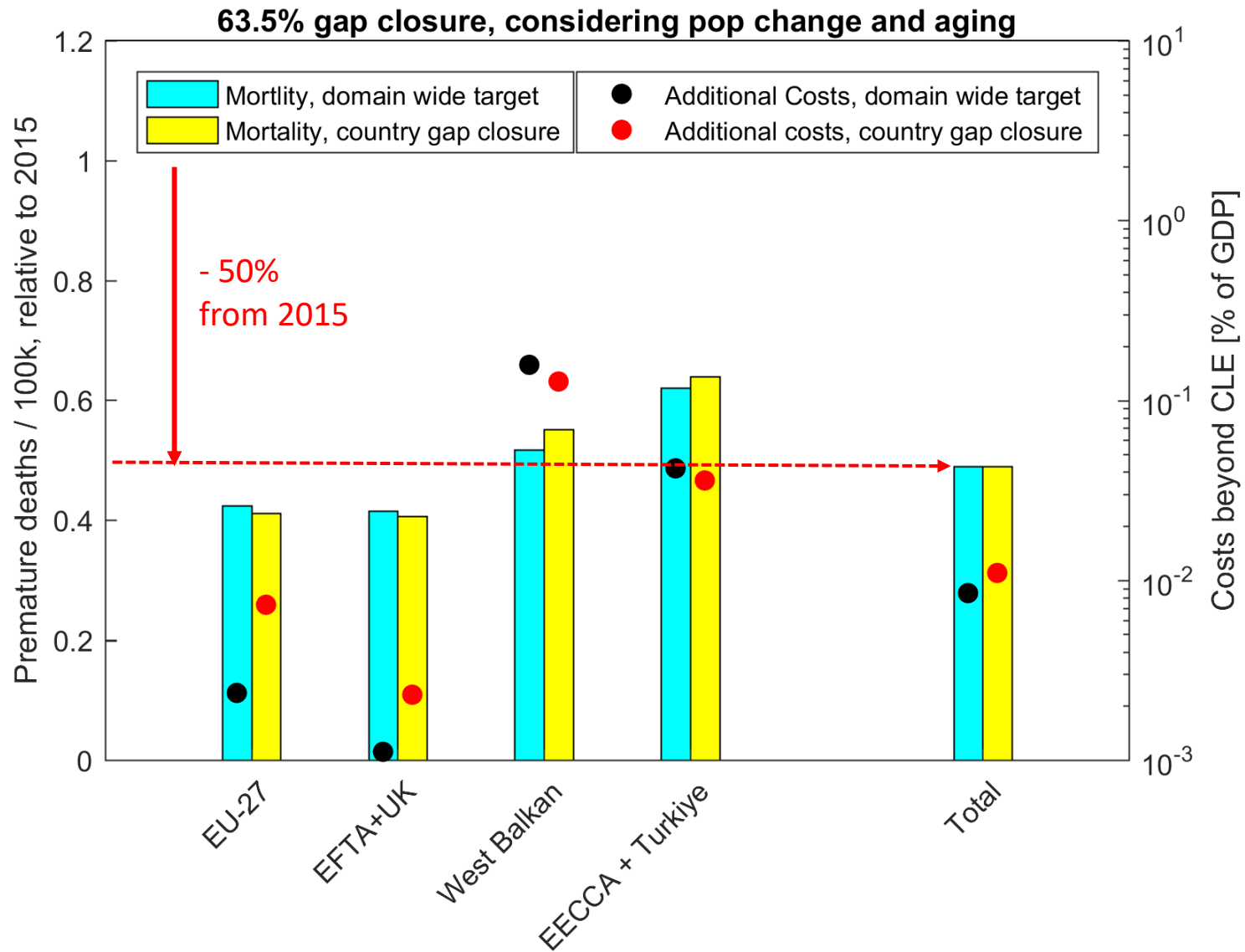
Achieving PM health impact targets by 2040

Scope for further mitigation in the UNECE region

Exploring attainability of reducing $PM_{2.5}$ related health risks by 50% , including North America



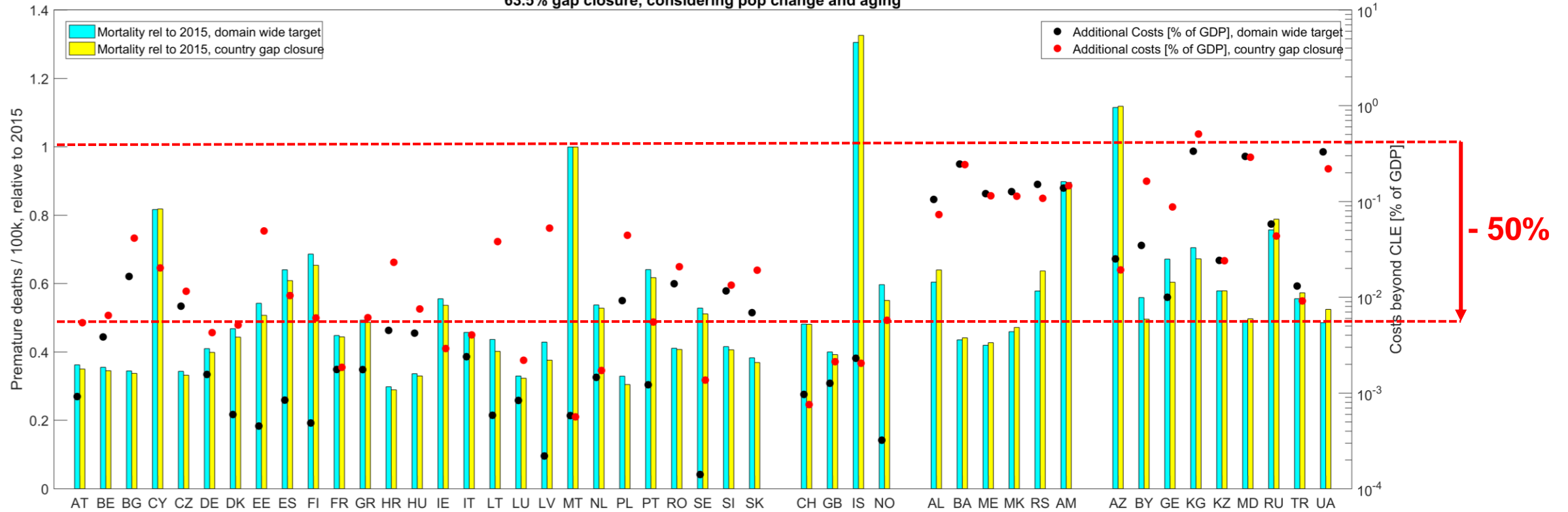
Least-cost reduction of PM health impacts in UNECE (excl. North America) by 2040



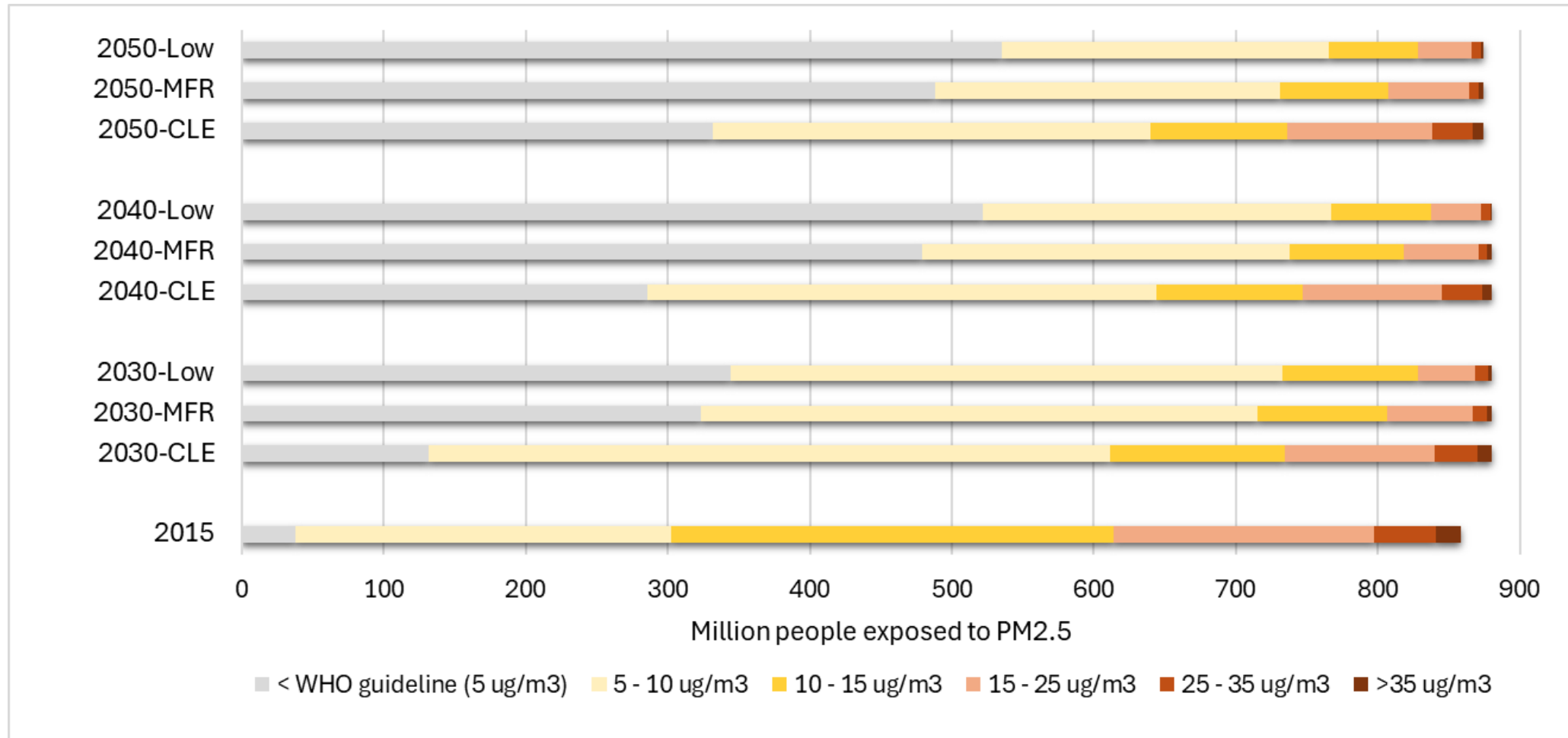
Least-cost reduction of PM health impacts in UNECE (excl. North America)

Results for the **Baseline 2040** achieving mortality reduction target (considering demographic changes)

63.5% gap closure, considering pop change and aging

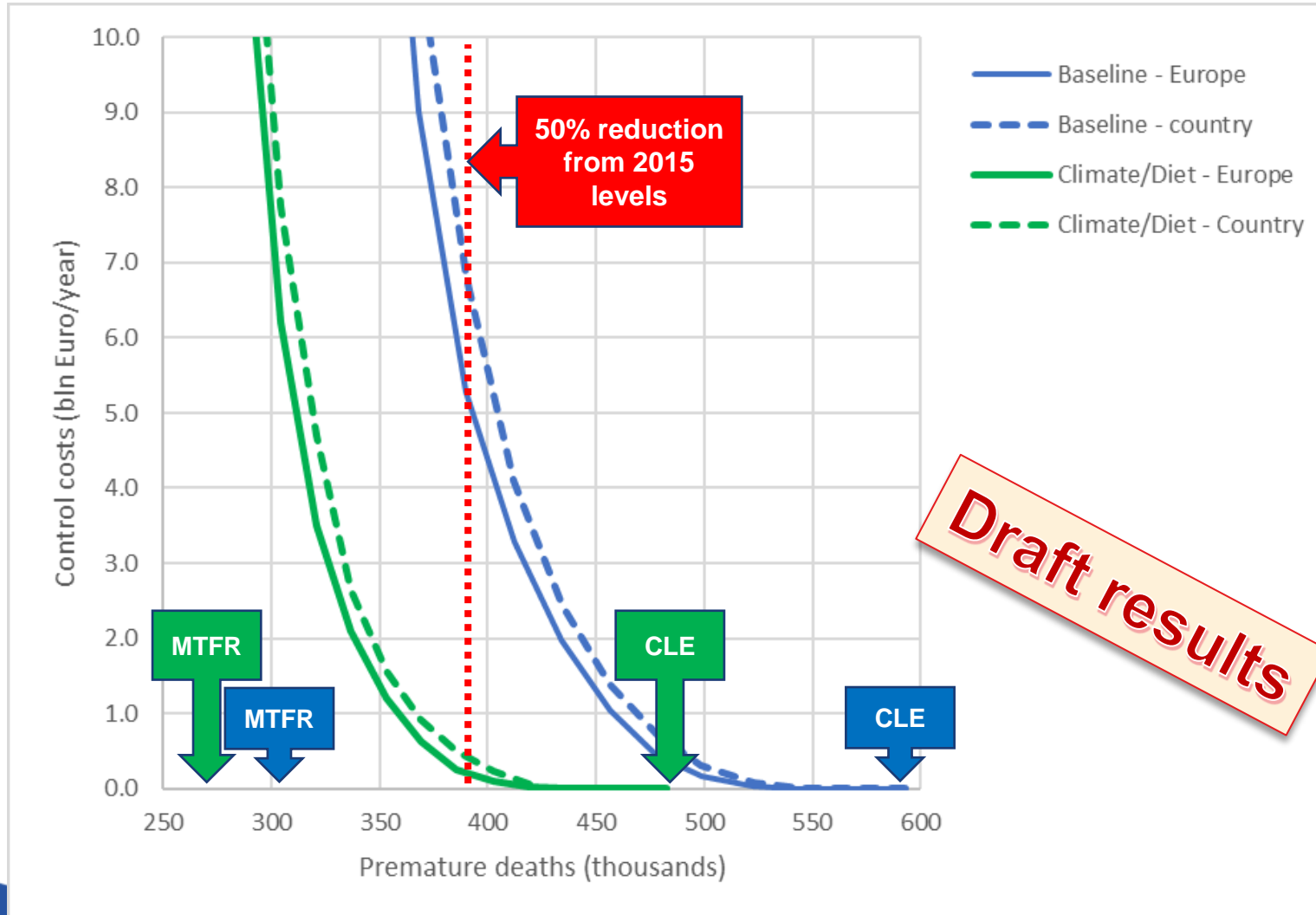


Exposure distribution



Least-cost reduction of PM health impacts in UNECE (excl. North America) by 2050

Optimization results for UNECE-wide improvements (—)
 Optimization results for equal improvement in all countries (.....)



- Full enforcement of *Baseline* policies achieves by 2050 over 40% of the target goal
- The 70% reduction of the feasible range ('gap closure') allows to achieve the 50% health target
- Preliminary estimates indicate nearly 30% higher costs for the case where equal improvements in all countries are achieved

- Introduction of **climate and dietary change policies** could achieve over half of the necessary reduction to reach the 50% health target, compared to the *Baseline scenario*
- Additional air pollution control costs would be over ten times lower, however, the case with equal country improvements would be twice as expensive as European target case
- In either case, some countries are not achieving 50% target or even show increase in premature mortality compared to 2015 (see next slides)

Draft results

Initial conclusions – Health targets by 2040

Feasibility: Achieving 50% reduction of 2015 premature deaths by 2040 is feasible at the UNECE level

Importance of CLE enforcement: Full enforcement of Baseline policies (CLE) achieves by 2040 about 30 % reduction in mortality compared to 2015, for dynamic population case (or about 60% of the target goal, respectively)

Mitigation efforts needs: The for 63.5% reduction of the feasible range ('gap closure') allows to achieve the 50% health mortality target dynamic population

Costs: Total costs and distribution varies significantly between the cases (equivalent of less than 0.1 % GDP to nearly 0.5 % GDP at the national level) with higher costs for the case where equal improvements in all countries are achieved

Including biodiversity targets in GAINS

Based on new empirical critical loads for N deposition

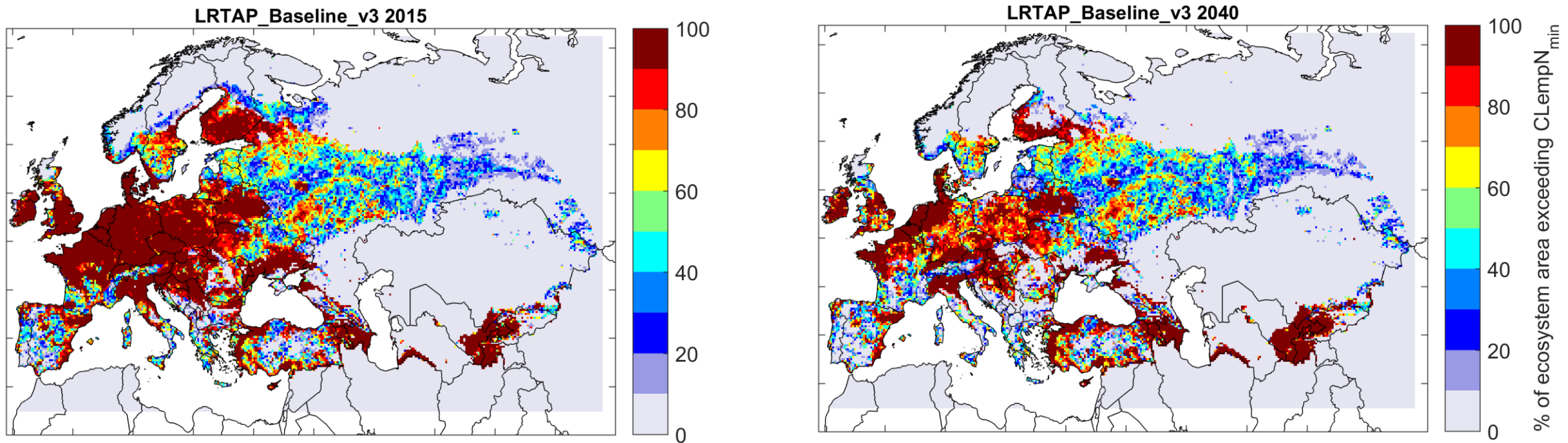
New empirical critical loads for nitrogen deposition

- CIAM received from CCE new data:
 - Empirical critical loads for 48 ecosystem classes
 - Giving min and max CL [kgN/ha/yr]
 - And ecosystem maps for the whole domain (area of each class per grid cell)
- CIAM has processed and implemented them in GAINS for CLE and MTRF projections and least cost scenarios
- Calculated indicators equivalent to the acidification/eutrophication calculations: area exceeding CL, average accumulated exceedance (AAE)
- Only land-based ecosystems are considered, not marine

Ecosystem area exceeding CLs: 2015 and 2040

Preliminary

Lower range of CLs (CLempN_{min})



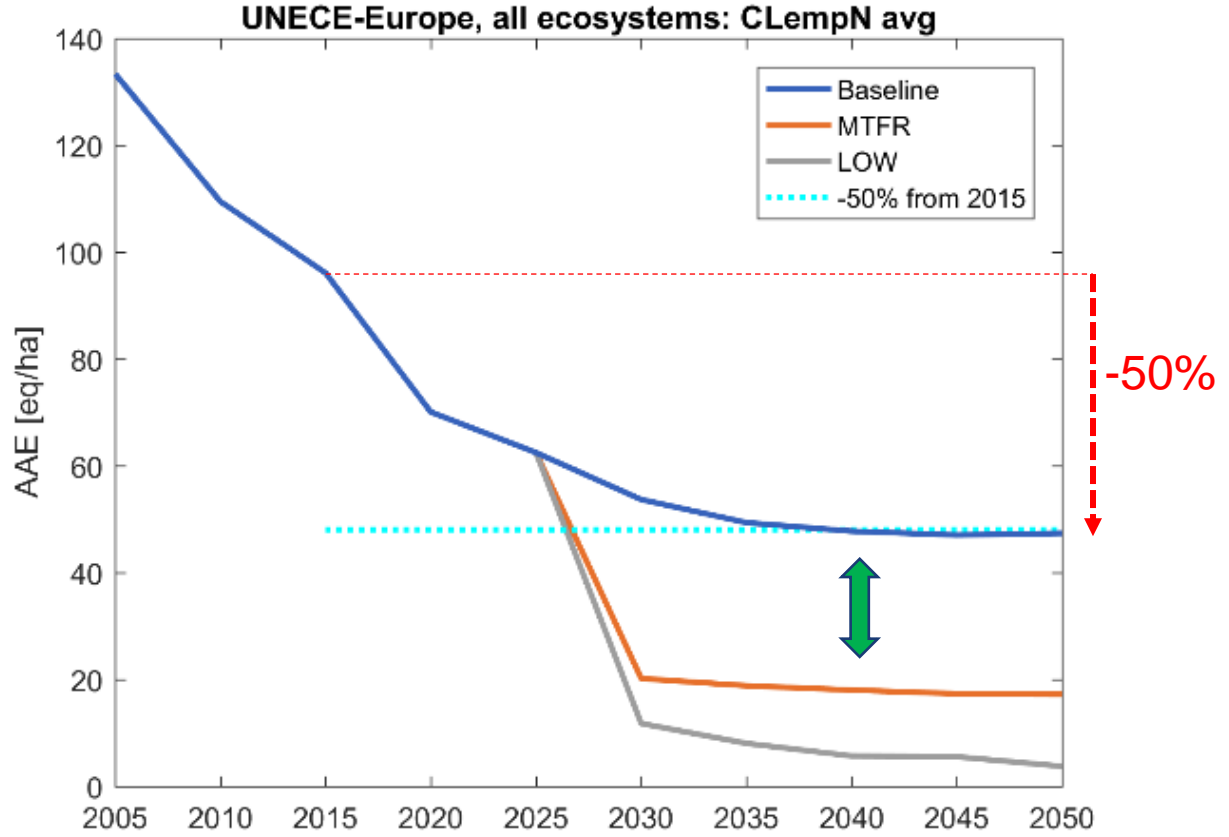
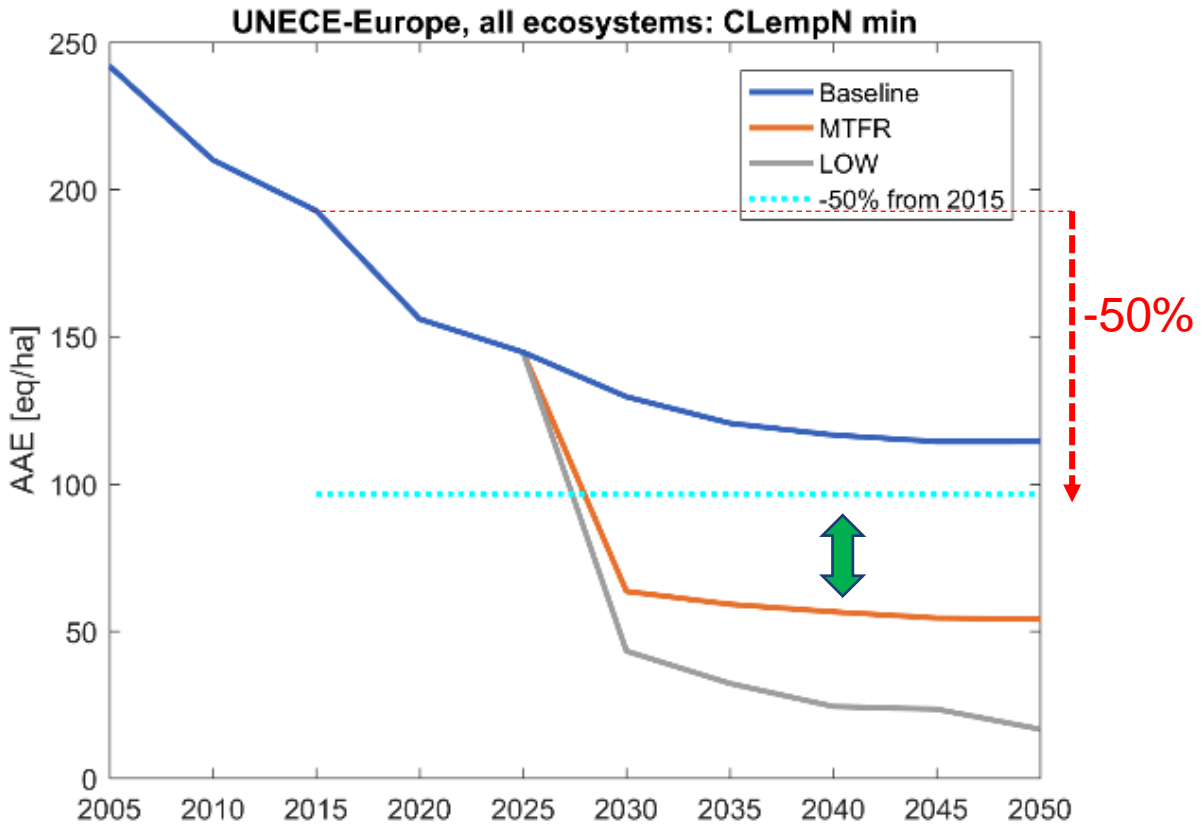
The message differs depending on ecosystem type and the uncertainty range of CL used!

Preliminary



Scope for further mitigation in the UNECE region

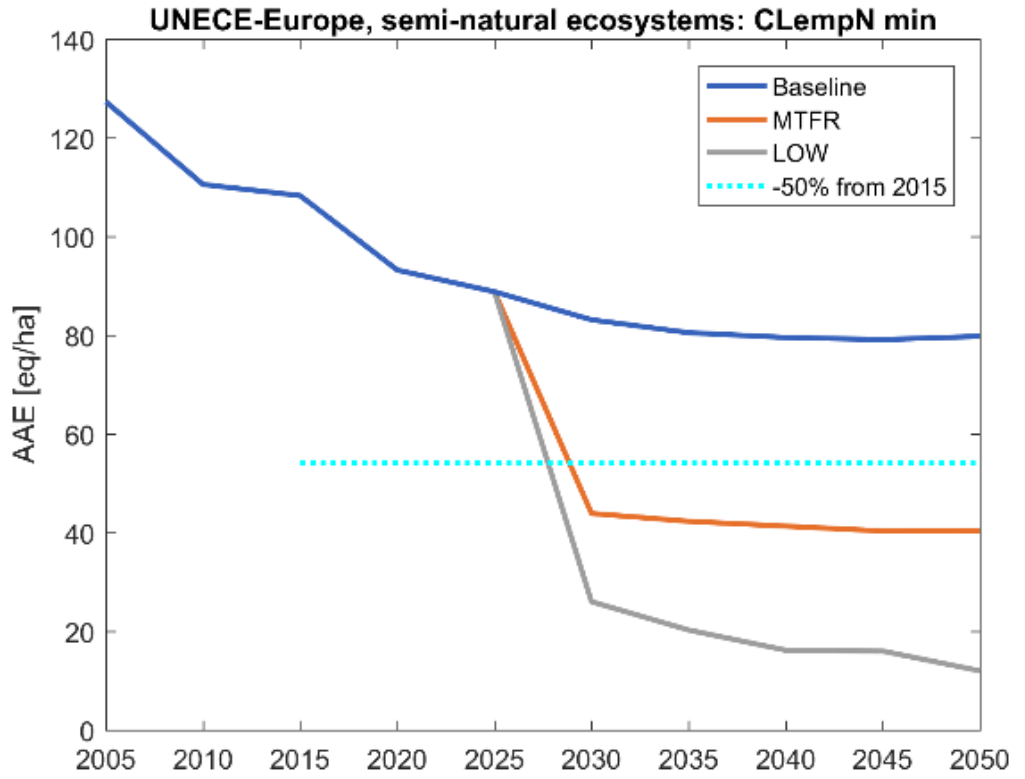
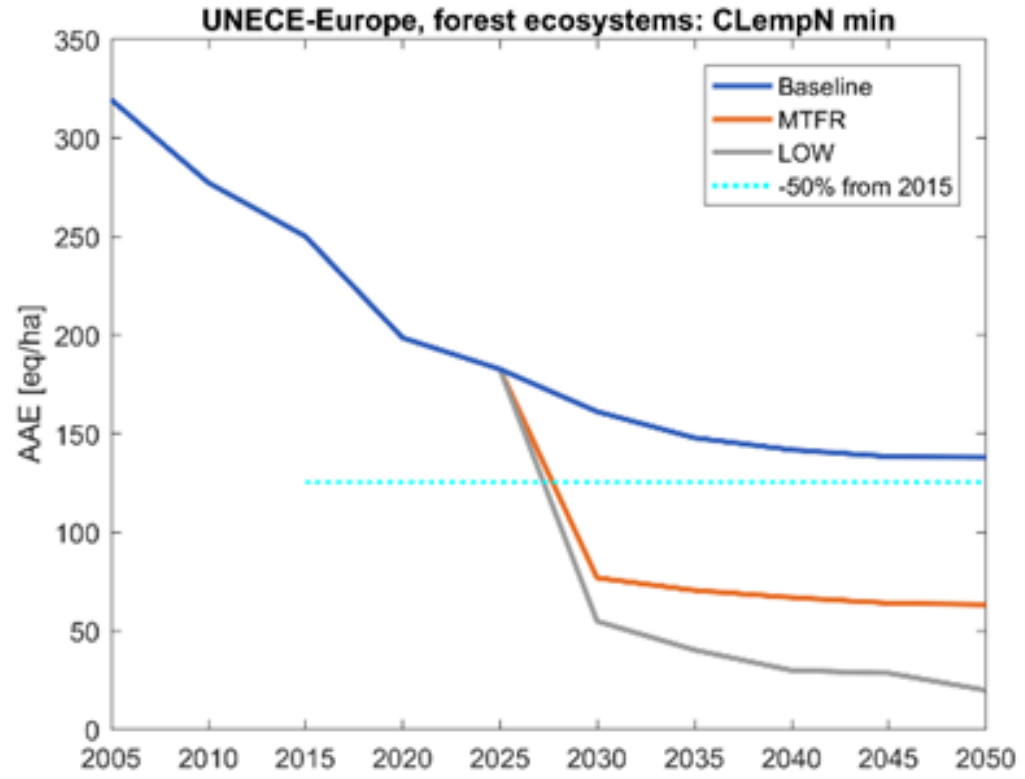
Exploring attainability of ecosystem (biodiversity) protection 'goals': AAE for all ecosystems



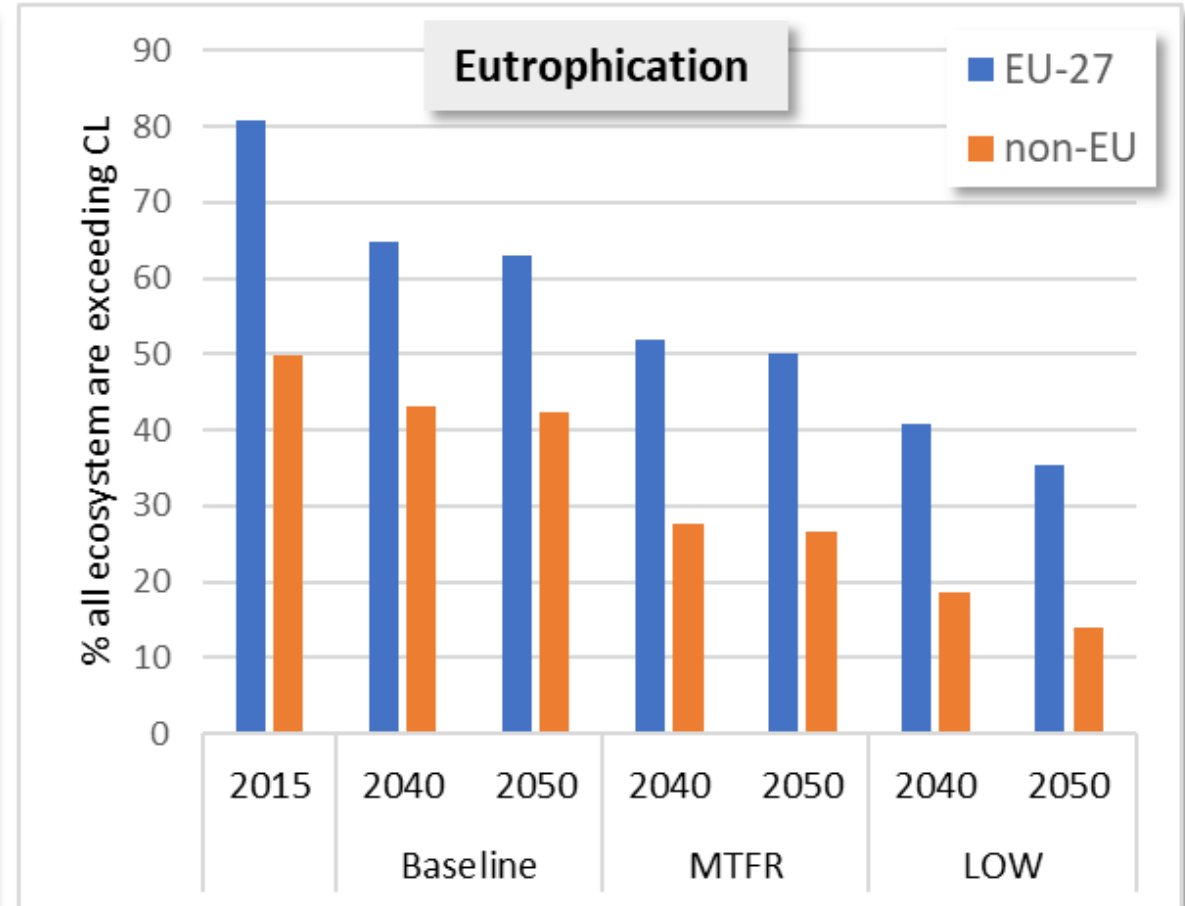
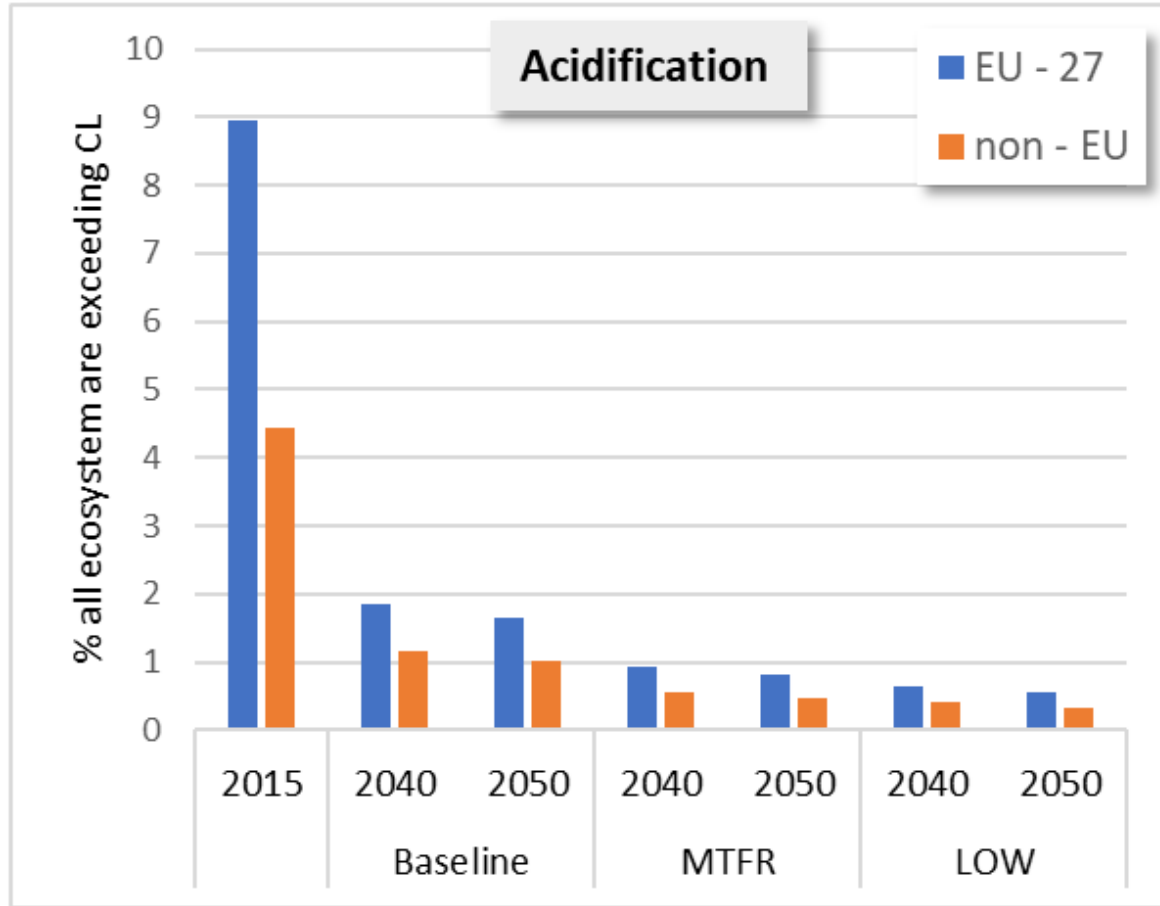
↑↓ Biodiversity risk when the health target of reducing mortality by 50% is achieved; the range reflects domain wide vs country based gap closure approach

Source: GAINS model (CIAM/IIASA)

Biodiversity of semi-natural ecosystems seem to be more sensitive



Acidification and Eutrophication



Non-EU includes West Balkan, UK, Iceland, Norway, Switzerland, Belarus, Ukraine, Moldova, European part of Russia up to 42°E

Initial conclusions – Biodiversity targets by 2040

Feasibility: Achieving 50% reduction of 2015 AAE for CLempN by 2040 appears feasible at the UNECE-Europe level and within all sub-domains and habitats considered here

Importance of CLE enforcement: Full enforcement of Baseline policies (CLE) achieves by 2040 about 40% to 50% reduction in AAE in UNECE-Europe compared to 2015, for CLempN-MIN and CLempN-AVG, respectively.

Achieving 50% health (PM mortality) target brings large benefits: Over 55% and nearly 70% of biodiversity risk (CLempN-min, CLempN-avg) could be reduced when PM health target of 50% reduction of premature mortality is met by 2040

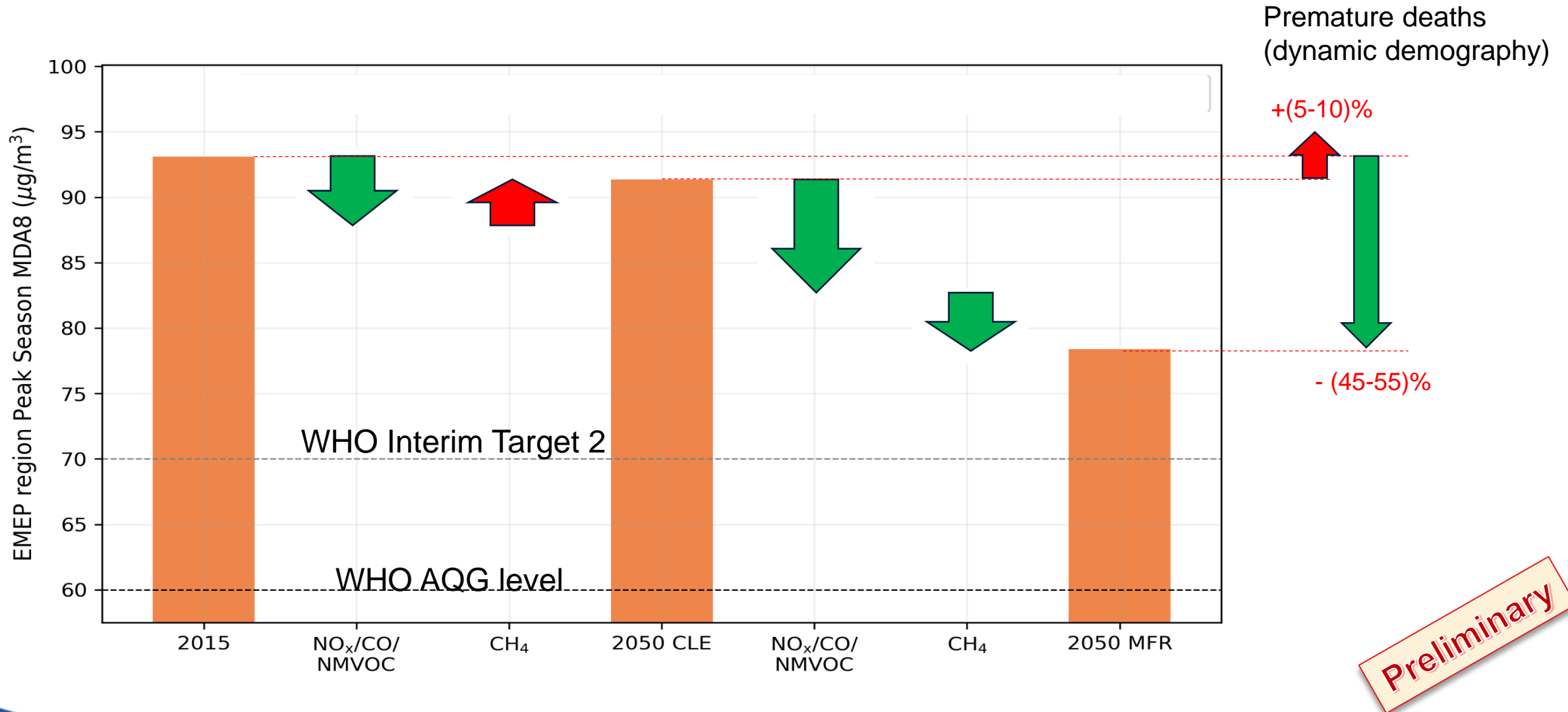
Cost optimization: to come. Discussion on indicator and level of disaggregation of ecosystems is ongoing. EMEP-WGE Bureau recommend to focus on reduction targets for different ecosystem types rather than for total ecosystems or for different countries.

Teaser for tomorrow

Some remarks on ozone and methane

- Based on modelling by MSC-W

Potential exposure reduction to peak ozone in the UNECE (excluding North America) of (global) ozone policies



Timeline (2024-25)

