TFIAM-CIAM

Policy brief on potential targets to reduce risks for health and ecosystems

Simone Schucht for the TFIAM/CIAM team

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TFIAM/CIAM Policy brief on potential targets to reduce risks for health and ecosystems

- An informal document to be updated throughout the GP revision process & reflecting CIAM modelling work
- Requested by WGSR-61 and EB-43
  - Assess the feasibility of an overarching risk-based goal for the Convention covering all air pollutants and impacts on health, starting with an indicative 50% reduction target
  - Cover also the risks of biodiversity loss and explore the potential of staged/phased strategies
- Current version
  - Version 4 for EB44 with Russian translation – this and earlier versions available at the TFIAM web-site
  - All emission data per country and sector available at the CIAM web-site
- Version 5 for WGSR-63

TFIAM web-site: https://iiasa.ac.at/policy/applications/task-force-on-integrated-assessment-modelling-tfiam-under-lrtap-convention
CIAM web-site: https://iiasa.ac.at/policy/applications/centre-for-integrated-assessment-modelling-ciam

Contents of the Policy Brief

- Overview of policy scenarios
  - Baseline climate, energy, and air pollution scenario
  - Maximum Technically Feasible (MTFR) air pollution control scenario
  - Combined advanced climate/energy/dietary scenario + MTFR = LOW
- Scenario impacts for pollutants, health and ecosystems
- Options for policy targets
  - Health (UNECE)
  - Reduction of biodiversity risks (UNECE excl. NA)
  - Inclusion of sectoral staged approaches - “flexibilities” (current non-parties)
- Conclusions

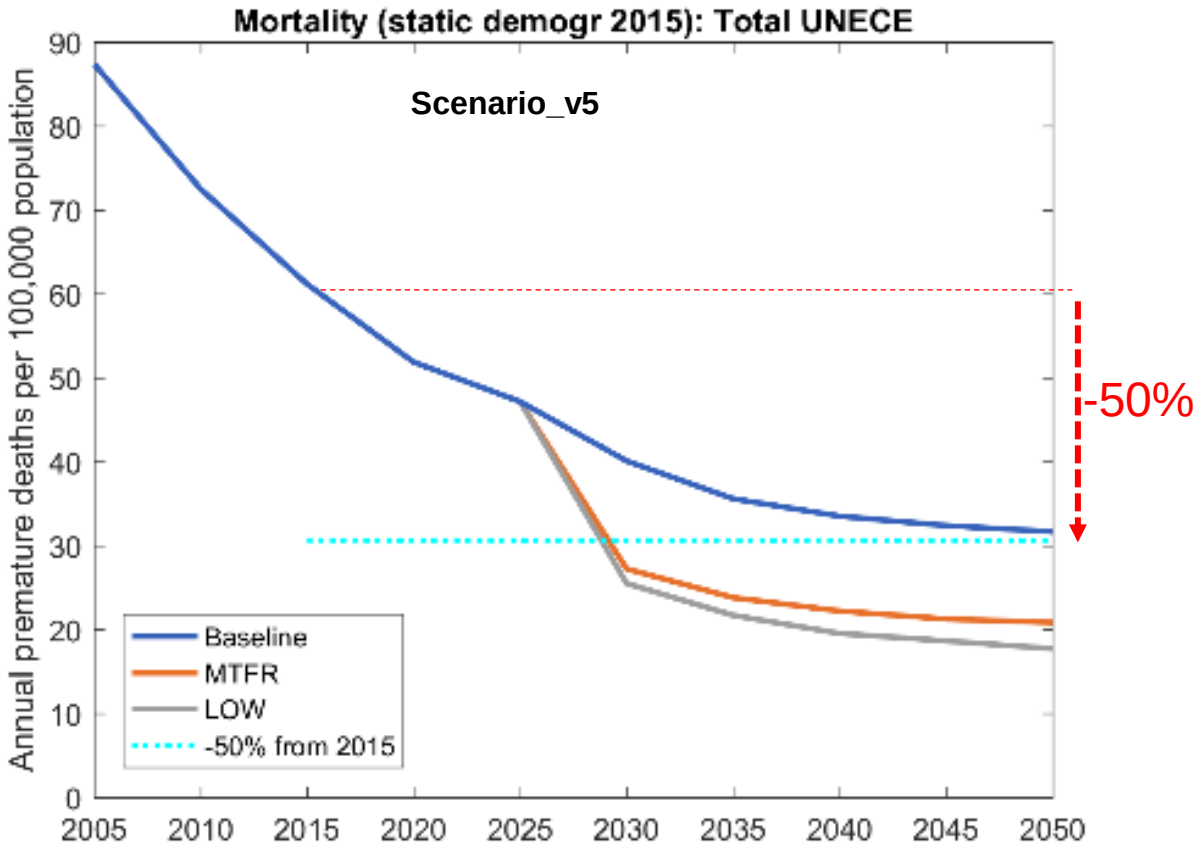
Emissions by scenario and country (incl. optimised results) and GNFR sector available on the CIAM web-page

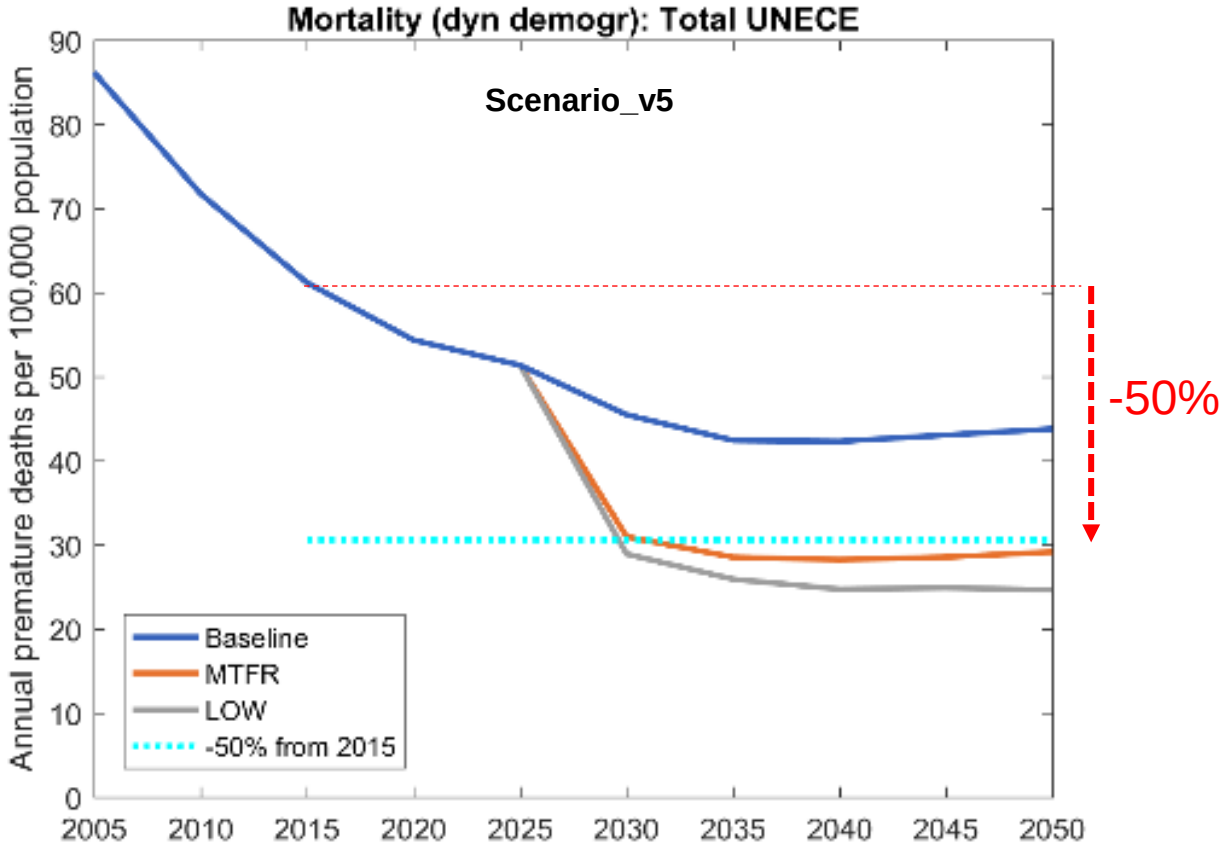
Current status of discussions by TFIAM - WGSR

- Assess least-cost solutions (=optimize) for 2040 relative to 2015
- Optimize reaching targets cost-effectively across the UNECE & through equal relative improvement in each country
- Indicative reductions of impacts by 50% as a starting point
- Optimisation based on risk-based indicator “deaths per 100,000 inhabitants” and dynamic population
- Results presented for further indicators (“ex-post”)
- Focus on anthropogenic (the avoidable) $PM_{2.5}$
- Use of Average Accumulated Exceedance (AAE) as indicator for nature protection, with optimisation for minimum and average N empirical critical loads

Scope for further mitigation in the UNECE region

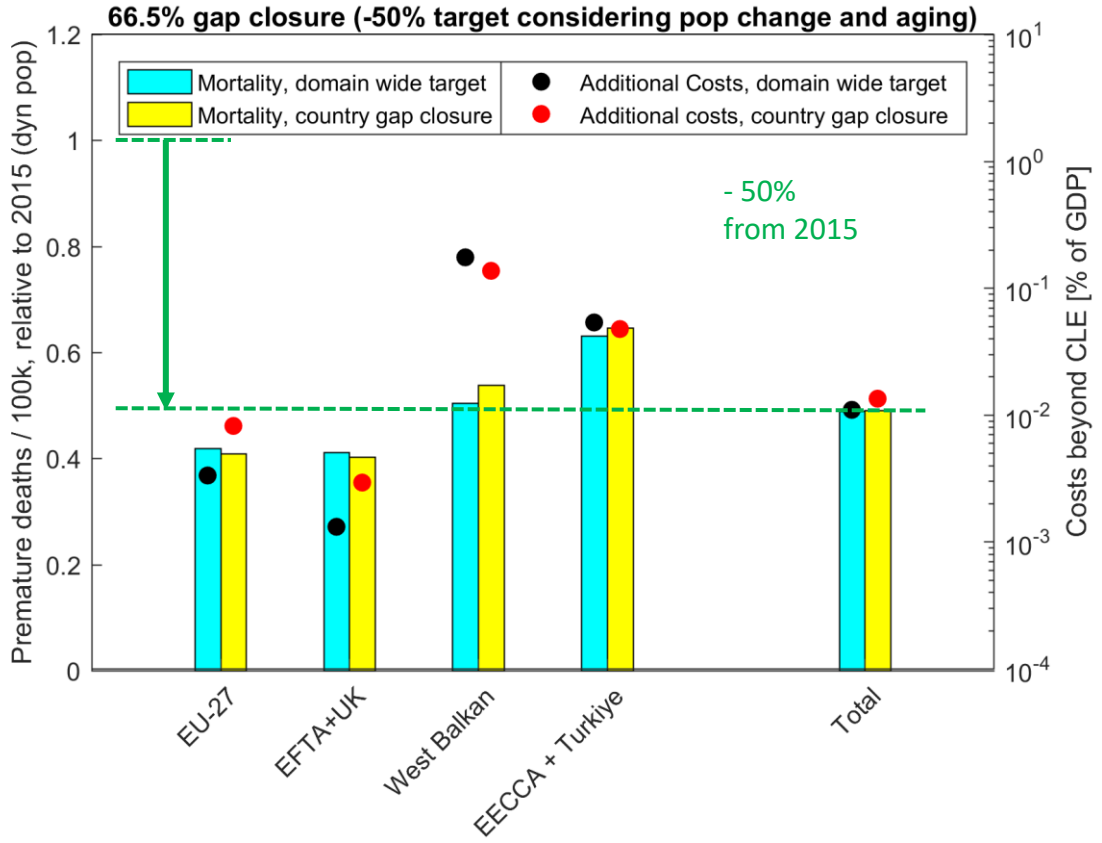
Exploring attainability of reducing $PM_{2.5}$ related health risks by 50% , including North America





Source: GAINS model (CIAM/IIASA)

Least-cost reduction of PM health impacts (premature mortality) in UNECE (excl. North America) by 2040; *scenario version 5*

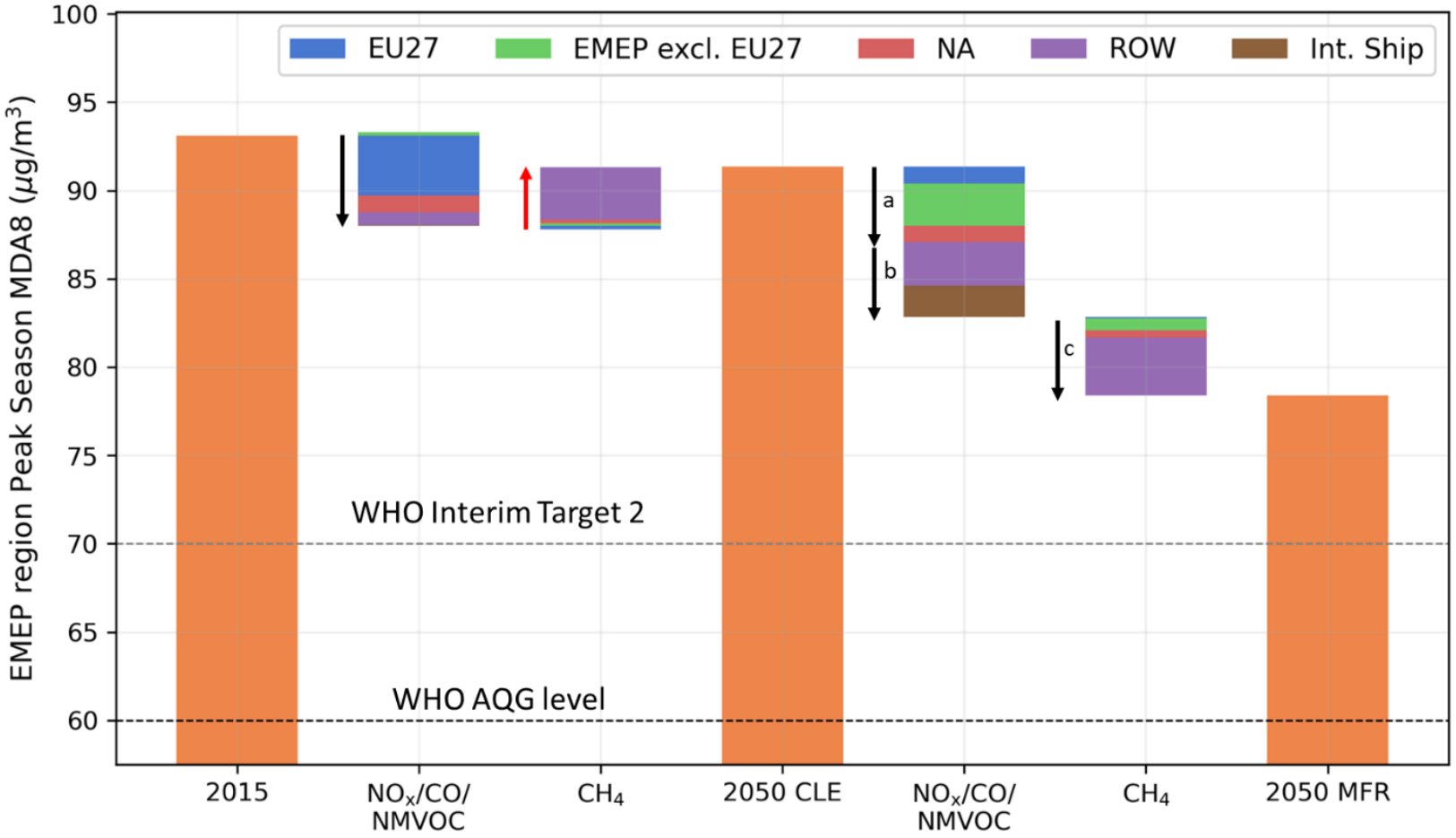


Source: GAINS model (CIAM/IIASA)

Conclusions of the Policy Brief (1)

- The indicative 50% health for $PM_{2.5}$ appears feasible at the UNECE level, but not for each country
  - Substantial differences in costs (as percentage of GDP)
- Pursuing climate and dietary change policies appears essential
  - Could bring important co-benefits and reduce additional cost

Feasibility of harmful ozone exposure reduction in UNECE

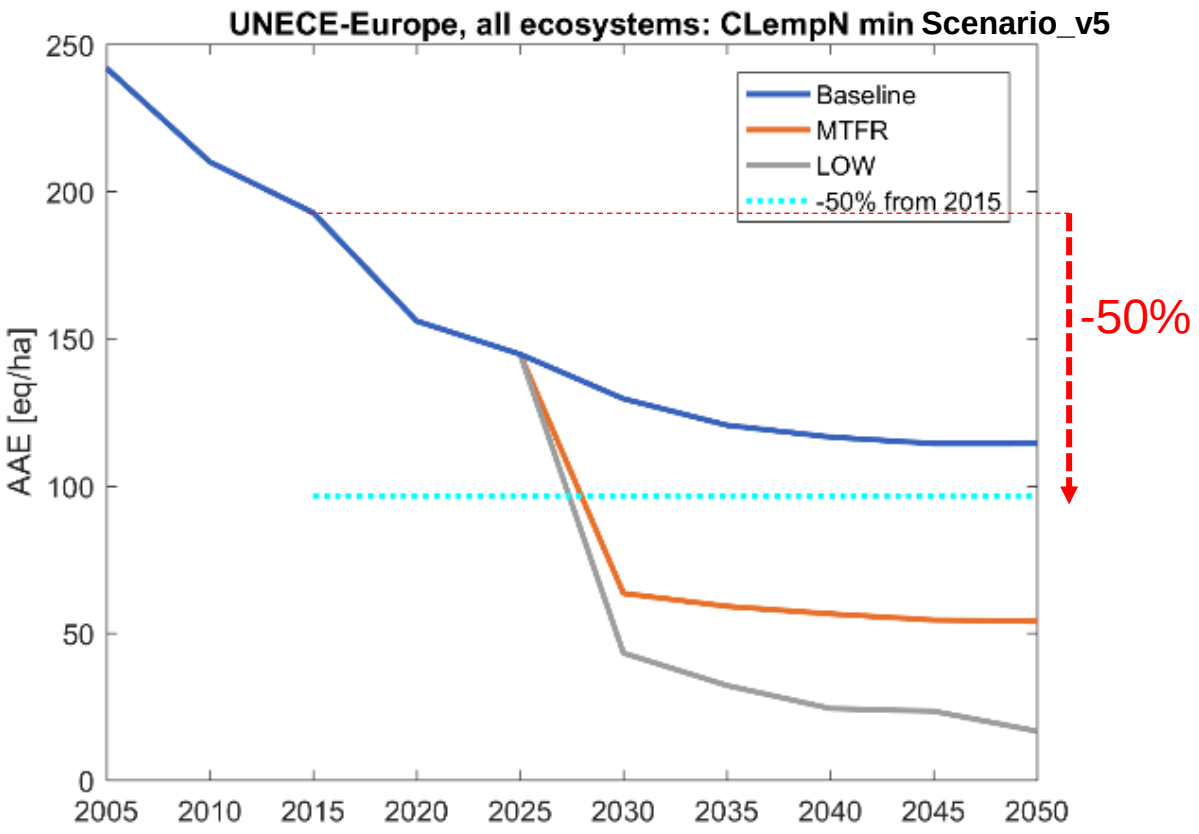


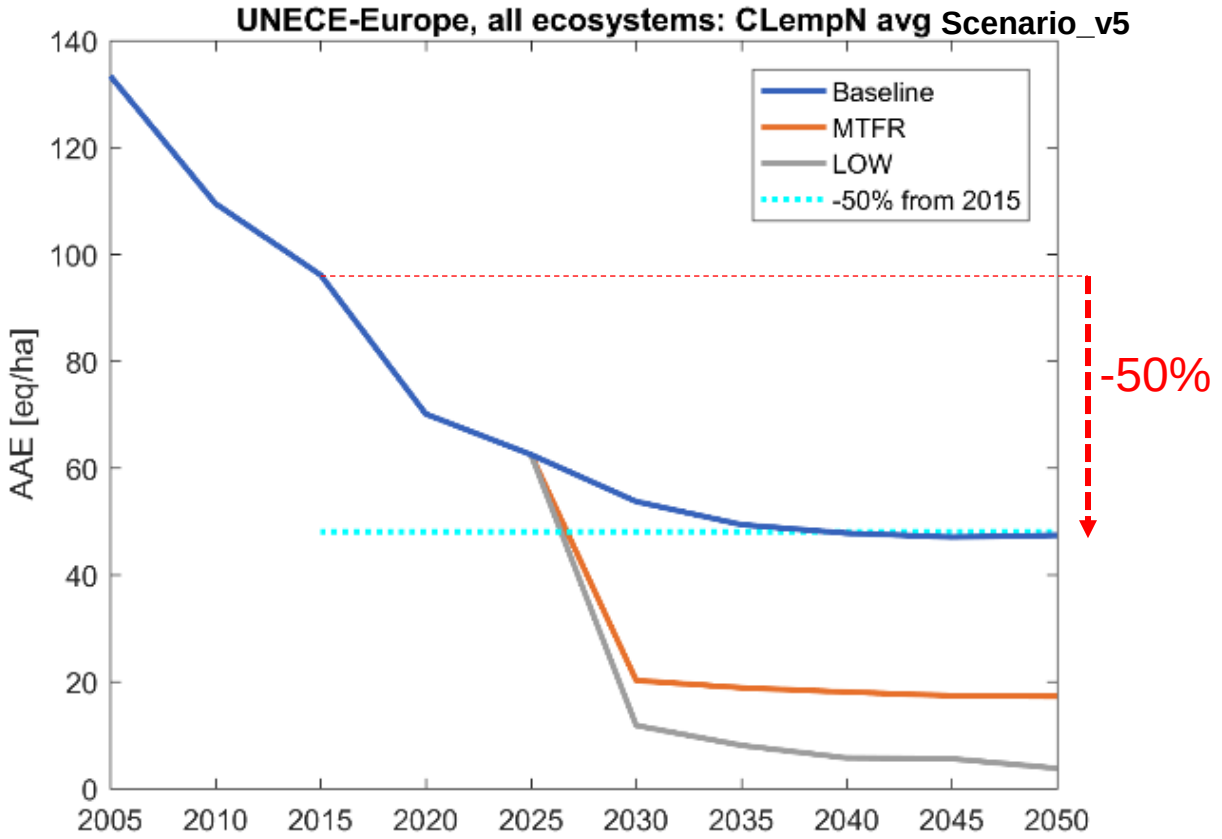
Conclusions of the Policy Brief (2)

- A 50% health target for O_3 is more challenging
  - Current air pollution policies (BL) are largely offset by the global increase in methane emissions
  - Feasibility of the target is more dependent on global cooperation to reduce ozone precursors (NOx, NMVOCs, CH_4)

Scope for further mitigation in the UNECE region

Exploring attainability of 50% ecosystem (biodiversity) protection goal: AAE for all ecosystems

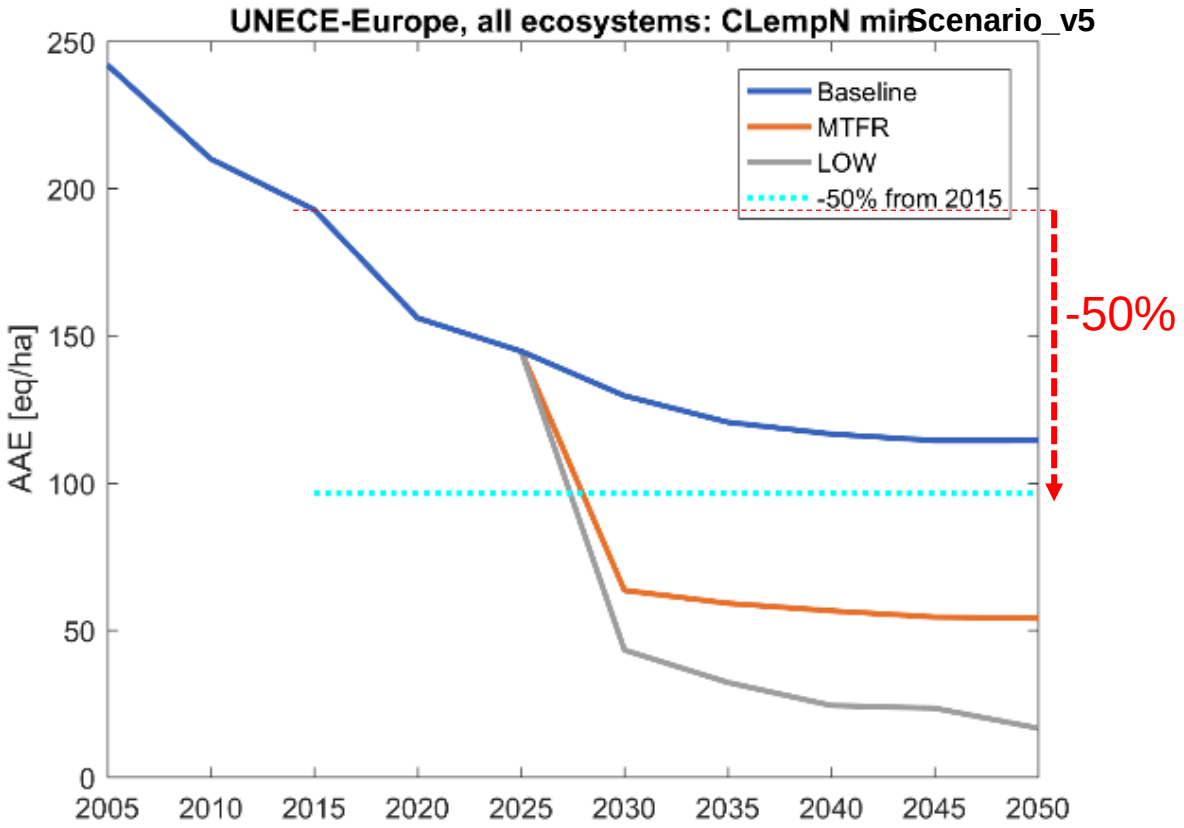


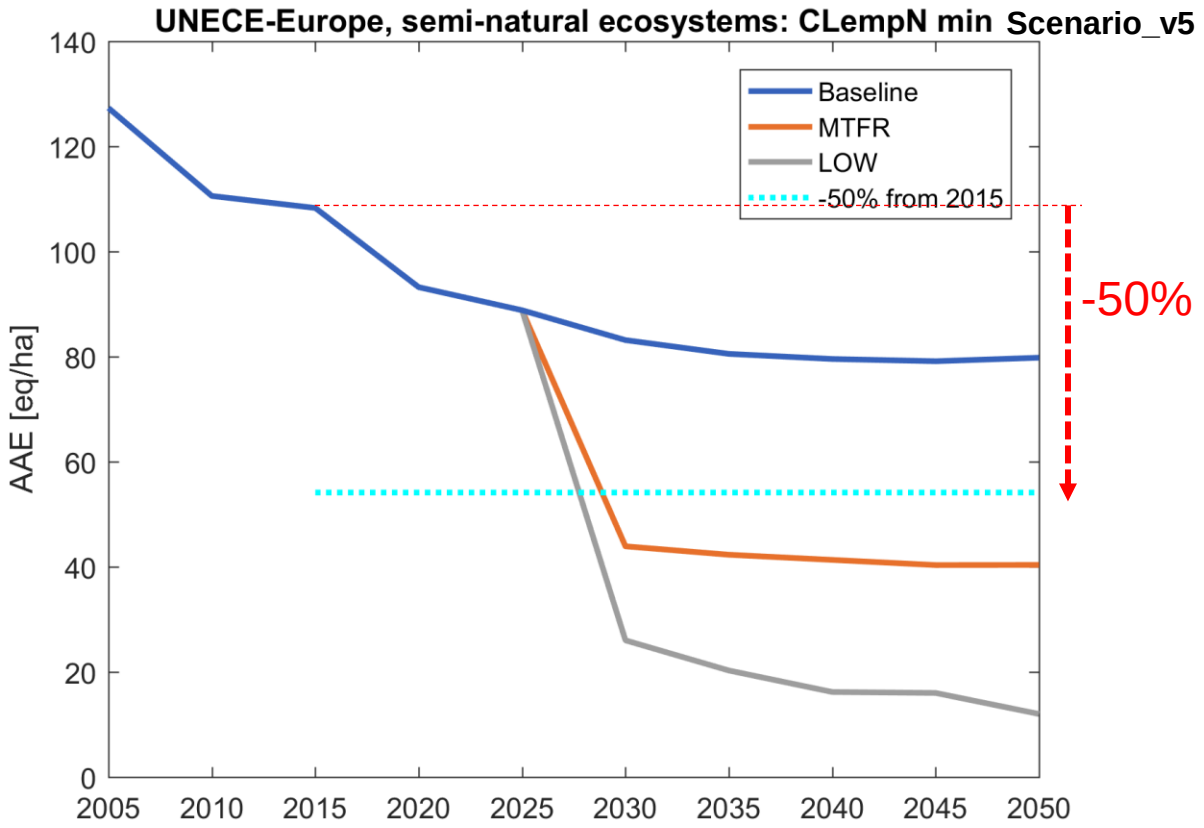


Source: GAINS model (CIAM/IIASA)

Scope for further mitigation in the UNECE region

Exploring attainability of 50% ecosystem (biodiversity) protection goal: AAE for all ecosystems





Source: GAINS model (CIAM/IIASA)

Conclusions of the Policy Brief (3)

- The attainability of 50% reduction in Average Accumulated Exceedance (AAE) for ecosystems differs across regions and between ecosystems types
  - Achievement of 50% reduction of 2015 AAE for CLempN by 2040 appears feasible at the UNECE-Europe level and within all sub-domains for total ecosystems
  - But not for each habitat type individually

Further considerations

- Health impacts from NO_2 will not be part of the target setting – but will be assessed ex post
  - Possible overlap in health impacts related both to exposure to $PM_{2.5}$ and to NO_2
  - Simplify communication
  - Avoid further complicating GAINS modelling
- Should all parties of the GP contribute to improving air quality?
  - Health risk reduction is a collective effort
  - If some parties do less, will other parties then do more to meet the collective risk reduction target?
  - There are likely health effects below WHO guidance levels
- Frequent interaction between parties and modellers needed
  - Improve mutual understanding of the complexity
  - Jointly develop a scenario that can be used as fair basis for the actual negotiations
  - WGSR is invited to give guidance on the choices to be made in modelling

Thank you!

TFIAM co-chairs

Stefan Åström (Sweden) Stefan.Astrom@anthesisgroup.com

Simone Schucht (France) simone.schucht@ineris.fr

CIAM head & deputy head

Zbigniew Klimont klimont@iiasa.ac.at

Gregor Kiesewetter kiesewet@iiasa.ac.at

Special consultant

Rob Maas robertus.maas@gmail.com

For presentations & conclusions from TFIAM and EPCAC meetings and documents:

Task Force on Integrated Assessment Modelling (TFIAM) under the LRTAP Convention | IIASA

For data and documents from CIAM:

Centre for Integrated Assessment Modelling (CIAM) | IIASA