

Science for Environment Policy

The co-benefits of co-ordinated climate change policy

Globally co-ordinated climate change policy to limit warming to 2°C could provide additional health, ecological and economic benefits. Using established methods, researchers estimated that the implementation of climate policy would also reduce global expenditures on air pollution control in 2050 by €250 billion.

Climate change mitigation is essential but expensive. However, the associated reduction in [air pollution](#) could provide substantial benefits, including [economic](#) savings. To make informed decisions, policymakers need quantitative information on the size of these potential co-benefits and their contribution to other goals of sustainable development.

This study, part of the EU Climate Cost¹ project, assessed the impacts on air pollution of international climate change policies consistent with meeting the EU target of limiting the rise in average global temperature from pre-industrial levels to 2°C. This was done by linking two well established models: Greenhouse Gas and Air pollution Interactions and Synergies (GAINS)², that models impacts and costs of strategies on a range of air pollutants, and the Prospective Outlook for the Long term Energy System (POLES)³, that simulates global energy activities.

By combining these two models the research estimated emission levels, costs and impacts over three time scales (2020, 2030 and 2050) for two scenarios:

- A baseline scenario that reflects current legislation on air pollution, as well as unchanged governmental energy and climate policies.
- A mitigation scenario that assumes implementation of policies to reach the 2°C target, potentially involving instruments such as international carbon markets and investments in renewable technologies.

The researchers estimated that, by 2050, the achievement of climate policy targets would reduce CO₂ levels globally by 80% relative to the baseline scenario. Emissions of air pollutants would also fall as a result of a lower use of fossil fuels. These reductions would vary with the pollutant: by 2050, sulphur emissions were projected to decrease by 70%, emissions of nitrogen oxides by 60% and emissions of PM_{2.5} (fine particulate matter less than 2.5 µm) by 30%, compared to the baseline scenario.

These reductions would bring significant economic savings by reducing the need for air pollution measures that would be required in the absence of climate change policy, the study indicates. Under the climate policy scenario, pollution control costs are 54% less in 2050 compared to the baseline scenario, which is equivalent to a saving of €250 billion per year.

In the EU-27, the study estimates that if the climate target is met in 2050, energy efficiency improvements and phasing out of polluting sources, such as coal, would halve air pollution control costs to approximately €35 billion per year.

The researchers also envisaged substantial health benefits. Anticipated reductions in PM_{2.5} concentrations could increase average life expectancy in the EU-27 by 1.2 months, in China by 19 months and in India by nearly 30 months. This would also bring significant ecological benefits by reducing the acidification and eutrophication of ecosystems.



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Contact: rafaj@iiasa.ac.at

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1. The Climate Cost project is supported by the European Commission under the Seventh Framework Programme. See: www.climatecost.cc

2. See: <http://gains.iiasa.ac.at/models/>

3. See: <http://setis.ec.europa.eu/about-setis/technology-map/methodology/energy-models>

4. See: http://ec.europa.eu/clima/policies/ets/index_en.htm