

A 3°C global RCP8.5 emission trajectory cancels benefits of European emission reductions on air quality

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Despite the international agreement to reduce global warming to below 2°C, the Intended Nationally Determined Contributions submitted for the COP21 would lead to a global temperature rise of about 3°C. The relative consequences of such a one-degree additional warming have not yet been investigated for regional air quality. From several future air quality scenarios for Europe performed with the regional chemistry-transport model CHIMERE, we found that a +3°C global pollutant emission trajectory with respect to pre-industrial climate (reached along the 2040-2069 period under a RCP8.5 scenario) would significantly increase European ozone levels relative to a 2°C one (reached along the 2028-2057 period under a RCP4.5 scenario).

This increase is particularly high over industrial regions, large urban areas and over Southern Europe and would annihilate the benefits of emission reduction policies. The regional ozone increase mainly stems from the advection of ozone at Europe's boundaries, themselves due to high global methane concentrations associated with the RCP8.5 emission scenario. These results make regional emission regulation, combined with emissions-reduction policies for global methane, of crucial importance.

Reference:

A. Fortems-Cheiney, G. Foret, G. Siour, R. Vautard, S. Szopa, G. Dufour, A. Colette, G. Lacressonniere, and M. Beekmann: A 3 °C global RCP8.5 emission trajectory cancels benefits of European emission reductions on air quality, *Nature Communications*, 10.1038/s41467-017-00075-9, 2017.