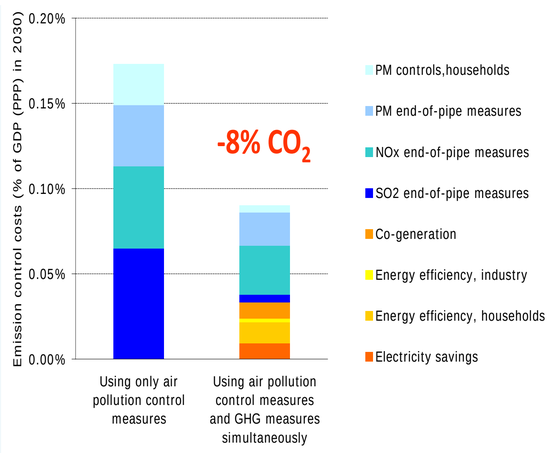
Air quality and greenhouse gases (AIR)

Co-benefits

Air pollution controls deliver tangible near-term benefits from measures aimed at the long-term global commons

As air pollutants and greenhouse gases often originate from the same sources, well-chosen policy interventions can deliver substantial GHG reductions that are already justified by local air quality concerns. This offers an attractive perspective for developing countries, where other policy objectives are perceived as more relevant than GHG mitigation.

Pollution control costs for reducing PM2.5 exposure in China by 50% (% of GDP)



Reference:
Amann et al. (2008) GAINS-Asia: Scenarios for cost-effective control of air pollution and greenhouse gases in China.

Non-CO_2 gases

Mitigation potentials for non-CO_2 gases are not well understood in the context of the 1.5℃ climate target

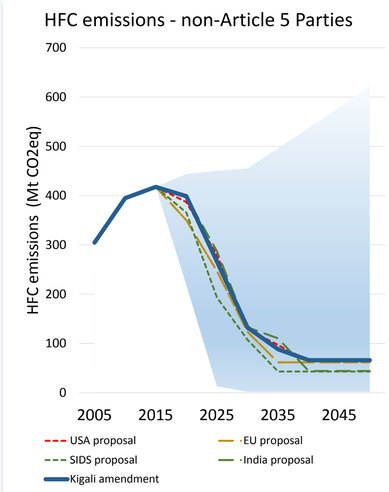
While the current climate targets imply negative GHG emissions, deep reductions of non-CO_2 emissions (CH_4, N_2O, F-gases) face technical limitations.

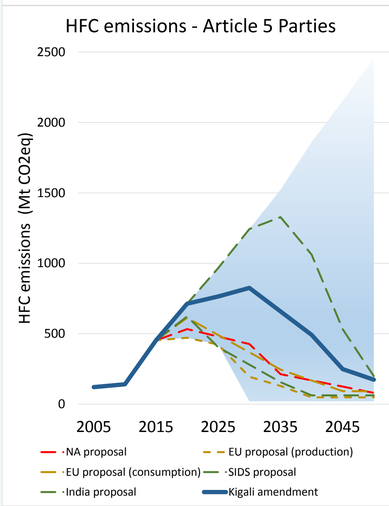
Behavioral changes (e.g., diets), less food waste and improved agricultural practices could offer additional mitigation potential, which would then lessen the need for negative CO_2 emissions.

References:

Purohit & Höglund-Isaksson (2016) doi:10.5194/acp-2016-727
Höglund-Isaksson (2012) doi:10.5194/acp-12-9079-2012
Höglund-Isaakson (2017) doi:10.1088/1748-9326/aa583e

The Kigali agreement



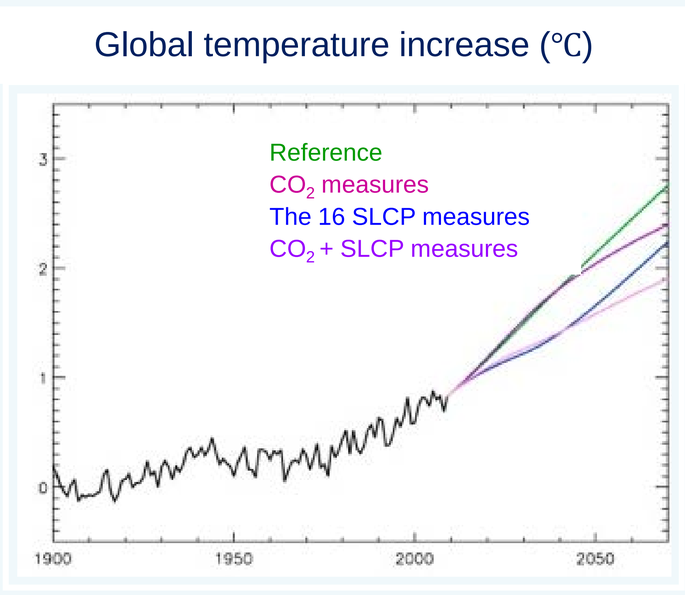


Short-lived climate pollutants

Implementation of 16 specific measures identified by IIASA can slow down temperature increase by up to 0.5 ℃

16 measures that reduce short-lived climate pollutants (SLCPs), i.e., methane and black carbon, could save millions of premature deaths from air pollution, reduce crop losses, and slow down temperature increase by up to 0.5 ℃. This work stimulated the formation of the Climate and Clean Air Coalition (CCAC) with now more than 100 state and non-state Parties.

Global temperature increase (℃)



Reference:
Shindell et al. (2012) *Science* 335 (6065) 183-189

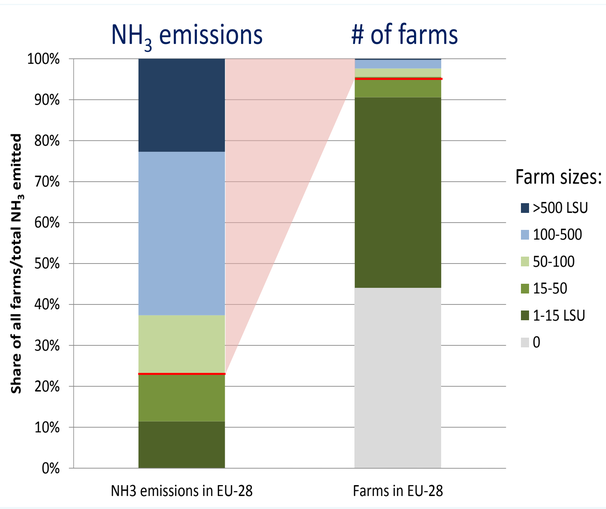
Emissions from agriculture

In the EU, 80% of agricultural NH_3 emissions are caused by only 5% of all farms

Agricultural activities, through their NH_3, CH_4 and N_2O emissions, make important contributions to the formation of small particles, they threaten bio-diversity, and contribute to climate change.

IIASA research shows that, e.g., in the EU, the vast majority of emissions is caused by a few large industrial farms, which however have powerful political lobbies.

NH_3 emissions by farm size



References:

Klimont, Winiwarter et al. (2015) ISBN 978-94-017-9721-4
Amann et al. (2016) EU Thematic Strategy on Air Pollution - Report #16