AIR & AGRICULTURE

The impacts of nitrogen pollution on air, water and soil cost the EU between €70 and €320 billion a year.

The agricultural sector is contributing to emissions of both air pollutants and greenhouse gases, including 95% of the EU's ammonia (NH_3) emissions. It also emits methane (CH_4) and primary particulate matter (PM) [1].

Ammonia is emitted mainly from animal manure and synthetic fertilisers. It contributes to eutrophication, acidification and other changes in ecosystems. It can also turn into secondary PM which harms human health.

Ruminants, such as cows and goats, are the main sources of methane from agriculture. Methane is both a powerful greenhouse gas and an ozone precursor (see Air & Climate factsheet).

Primary PM mainly originates from the burning of agricultural waste, a practice that is illegal in most Member States, but which is still common according to satellite observations [2].

EU legislation

- Agricultural emissions are partly addressed by the National Emissions Ceilings (NEC) Directive, which sets overall caps on pollutants such as ammonia. However methane and PM are not yet covered by the existing directive.
- Although emissions from the larger poultry and pig facilities are regulated under the Industrial Emissions Directive, those from cattle (responsible for 60% of EU ammonia emissons) remain unaddressed.
- The Nitrates Directive has helped to improve nitrogen management at national level. However its primary aim is to address nitrogen pollution in water - not air pollution.

FACTS AND FIGURES

95% AMMONIA EMISSIONS IN EU ARE FROM AGRICULTURE [3].

3.2 MLN TONNES NITROGEN LOST AS NH_3 TO ATMOSPHERE EVERY YEAR IN EU [3].

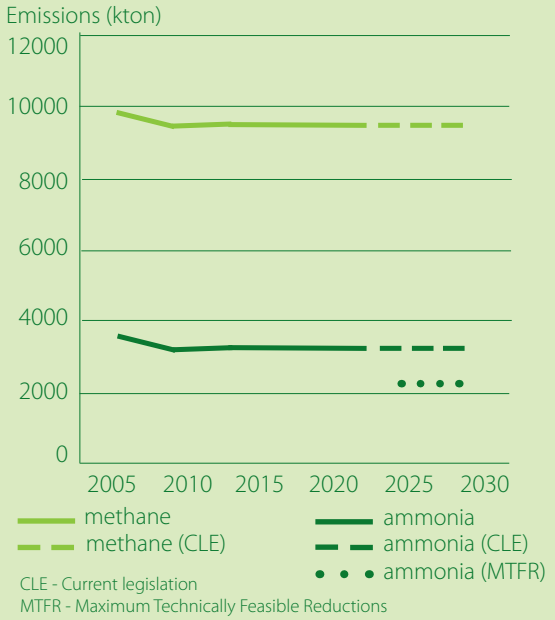
Ammonia emissions form secondary PM, which is known to provoke around 400,000 premature deaths annually in the EU, bringing down the average life expectancy of Europeans by approximately 6-12 months [4].

2/3 of EU ecosystems are currently exposed to more nitrogen deposition than they can cope with and 1 in 10 receives too much acid deposition [5].

The impacts of nitrogen pollution on air, water and soil cost the EU between 70 and 320 billion euros a year [6].

In the mid 1990s, 12% of the Mediterranean basin exceeded the threshold for nitrogen impact. In a business as usual scenario, this share will reach 69% by 2050 [7].

Baseline scenarios for agricultural emissions in the EU-28



CLE - Current legislation
MTFR - Maximum Technically Feasible Reductions

COMMON HEATHER

(Calluna vulgaris)
is one of many species that are outcompeted by grass when nitrogen depositions are high [5].

UREA-BASED FERTILISERS

Urea accounts for about 20 % of the nitrogen fertilisers used in the EU. It is popular in some regions since it is cheap and relatively safe to work with, but a big disadvantage of urea, compared to other synthetic fertilisers, is the emissions of nitrogen to the atmosphere in the form of ammonia. Losses may exceed a fifth of the applied nitrogen.

Techniques to minimise losses exist, such as direct incorporation into the soil and the use of inhibitors which restrict the conversion of urea to ammonium. Another way is to replace urea with nitrate-based fertilisers.

NITROGEN MANAGEMENT IN THE NETHERLANDS

The Netherlands has managed to reduce ammonia emissions by more than 50% in the last few decades. This has been made possible through comprehensive sector-specific legislation:

- a ban on slurry application in the season without plant growth and when the soil is frozen. Slurry silos must be covered to reduce ammonia volatilisation;
- slurry application techniques with low ammonia emission rates are compulsory on grassland and arable land on almost all soil types;
- schemes to reduce livestock numbers by licensing pig and poultry production;
- construction of green-label livestock buildings through incentives to reduce ammonia volatilisation;
- introduction of mandatory nutrient budgets for all farms.

SUSTAINABLE FOOD PRODUCTION & CONSUMPTION

More sustainable agricultural practices embracing lower stocking density, organic fertilising methods and crop rotations would help both air quality and the climate by reducing emissions of ammonia and greenhouse gases such as methane and CO_2. Changing consumption patterns is also critical. With its "Veggie Thursday", Ghent was the first city to promote one meat-free day a week.

For footnotes, please refer to separate reference sheet and to the EEB website.

EUROPEAN ENVIRONMENTAL BUREAU

HEAL

ClientEarth

AirClim

SOOT FREE FOR THE CLIMATE

RECOMMENDATIONS

- Adopt ambitious emission reduction commitments in the revision of the NEC Directive. Emission reduction commitments must go beyond the Gothenburg Protocol and aim to achieve the health and environmental objectives of the EU's 6th and 7th Environment Action Programmes by 2030.
- Introduce mandatory sector specific measures to limit ammonia emissions from relevant agricultural sources. This can be done via BATs (best available techniques) and/or emission limits for large farms, including cattle. The efficacy and cost-effectiveness of such measures has been very well documented.
- Include cattle in the Industrial Emissions Directive.
- Include critical levels of ammonia in the the Ambient Air Quality Directive to protect ecosystems.
- Include the Water Framework Directive and Sustainable use of pesticides in the cross compliance mechanism under the CAP as soon as possible.
- Under the Common Agricultural Policy (CAP), Member States should make use of their flexibility in order to increase the budget for rural development (pillar 2) and include measures on air pollution from agriculture within their rural development programs.

More information

- Draft guidance document for preventing and abating ammonia emissions from agricultural sources, UNECE, April 2011
- The nitrogen footprint calculator http://www.n-print.org/
- EEA Signals 2013 - Every breath we take Improving air quality in Europe, July 2013, European Environment Agency
- Reports and briefings at www.eeb.org and www.airclim.org