

For our Environment

Umwelt 
Bundesamt

EP-CAC, Bratislava, 27 November 2019

Ammonia reduction according to the German NAPCP – a holistic approach?

Andreas Eisold

Section II 4.1 / General Aspects of Air Quality Control

with support from Marcel Langner, Johanna Appelhans, Kevin Hausmann, Stefan Feigenspan, Stephan Nordmann, Markus Geupel, Gabriele Wechsung

What is relevant for cities?



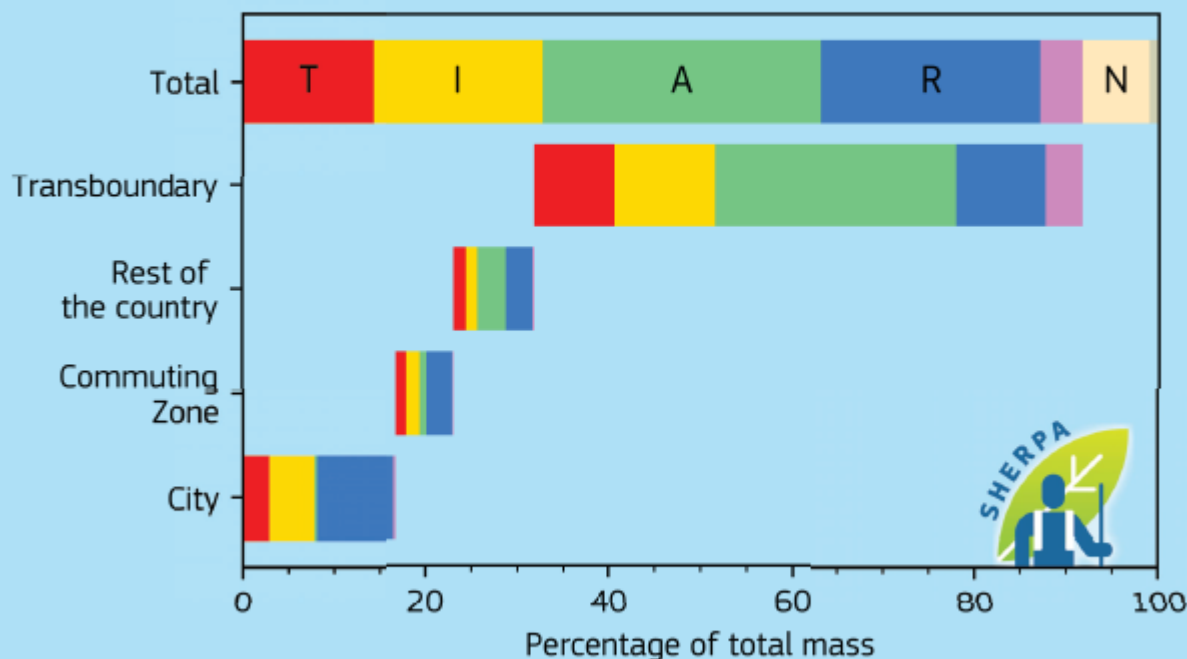
Why is ammonia relevant for clean air in cities?

Slovakia, Bratislava

Urban PM_{2.5} Atlas
Air quality in European cities

*P. Thunis, B. Degraeuwe, E. Pisoni,
M. Trombetti, E. Peduzzi, C.A. Belis,
J. Wilson, E. Vignati*

PM_{2.5} Spatial and sectoral allocation (SHERPA v.1.9)

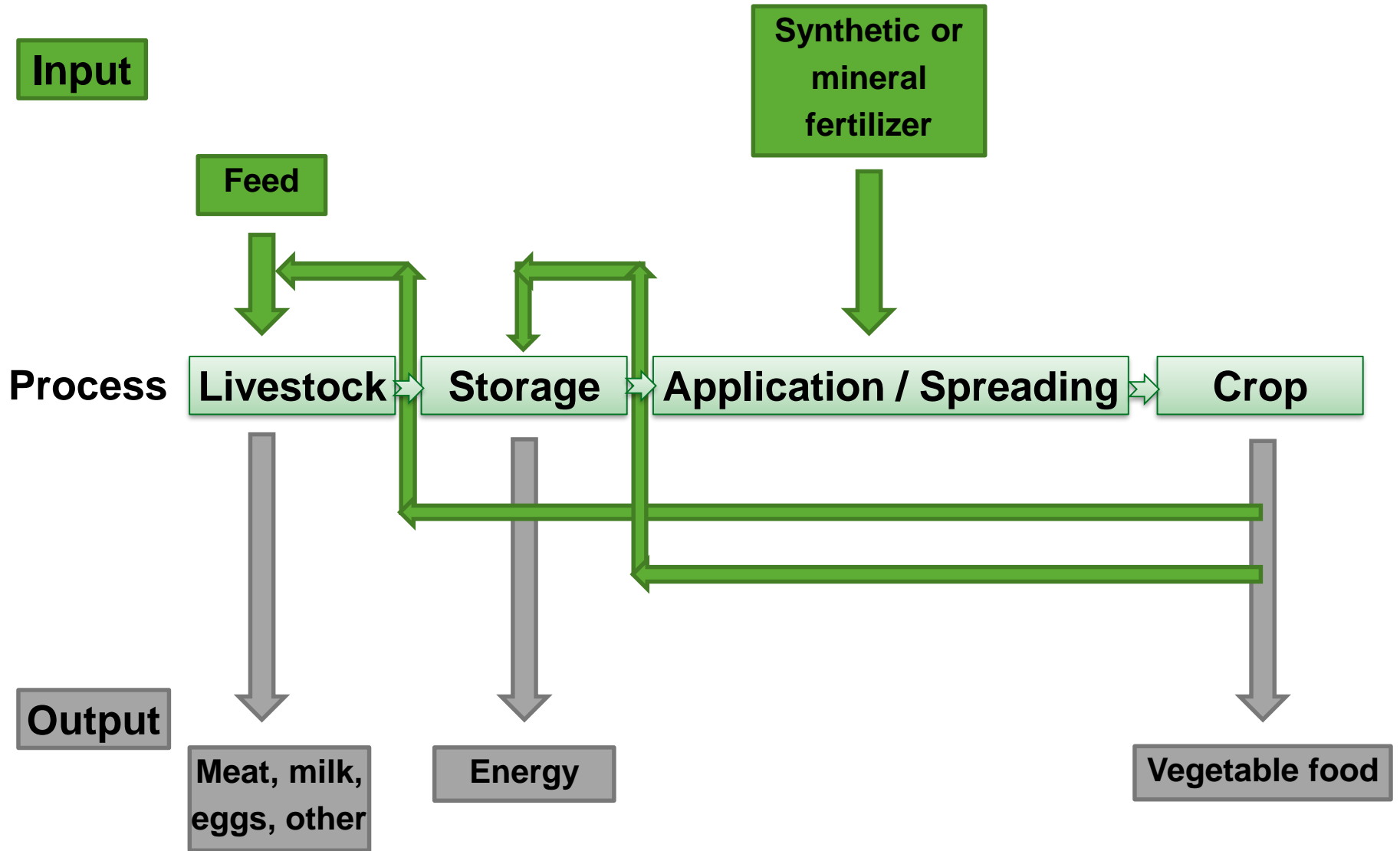


- T - Transport
- I - Industry
- A - Agriculture
- R - Residential
- O - Other
- N - Natural
- E - External

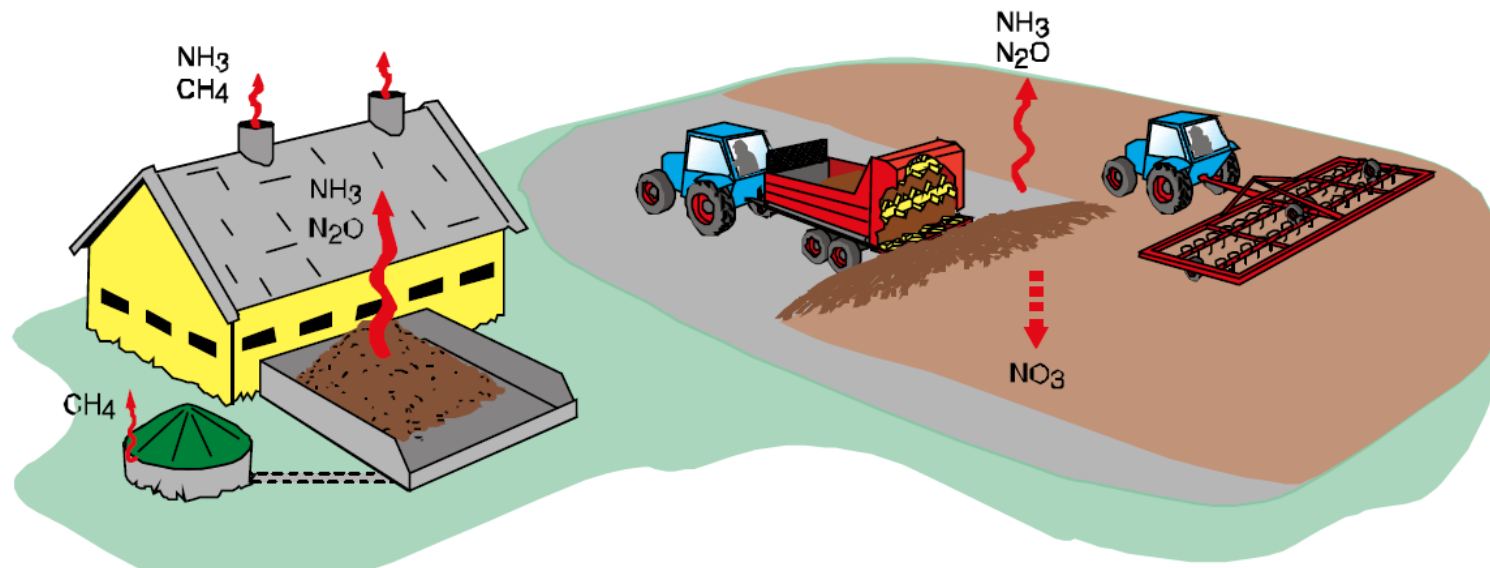
JRC Science Hub
<https://ec.europa.eu/jrc>

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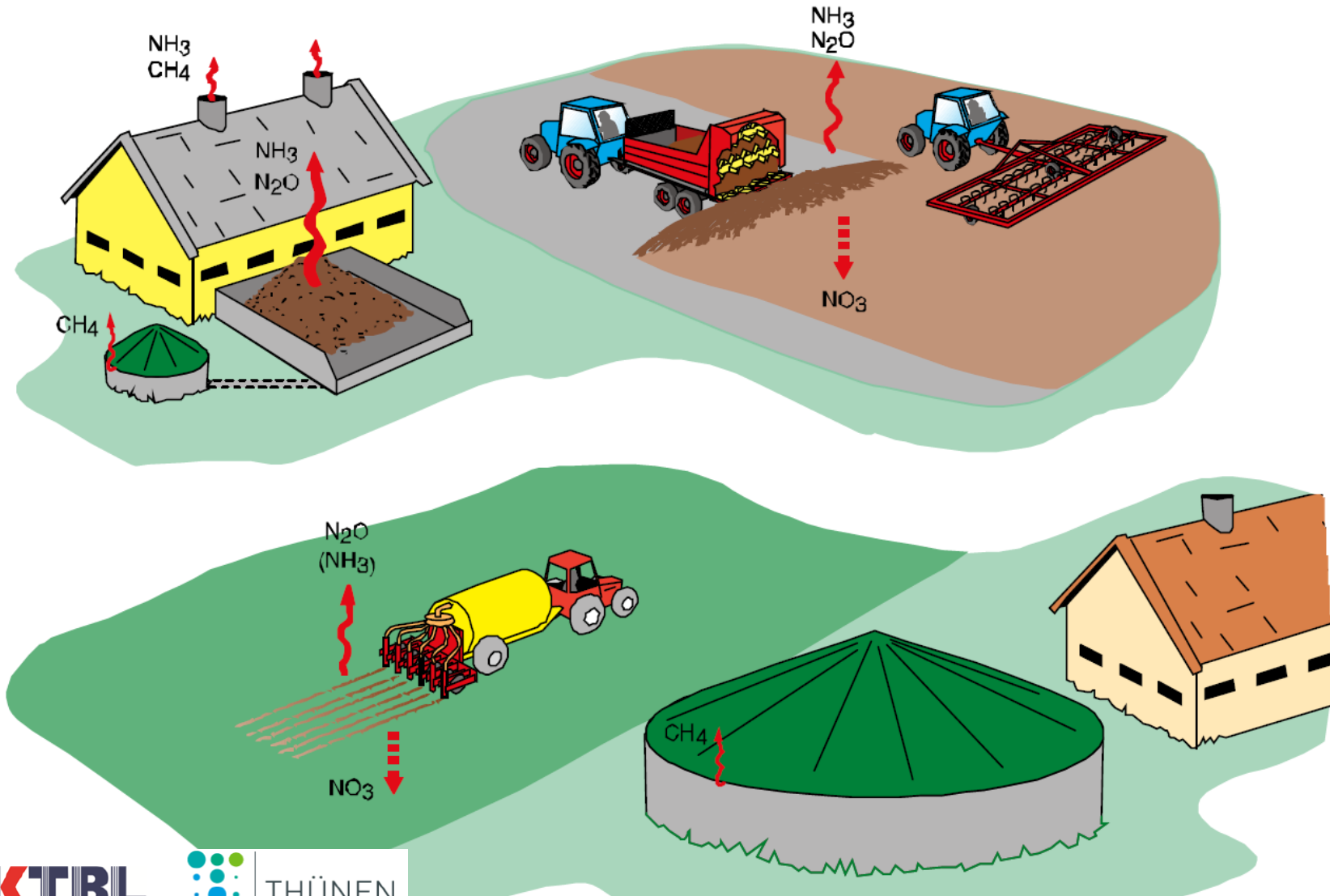
Nutrient flow in agriculture



Nutrient losses in agriculture



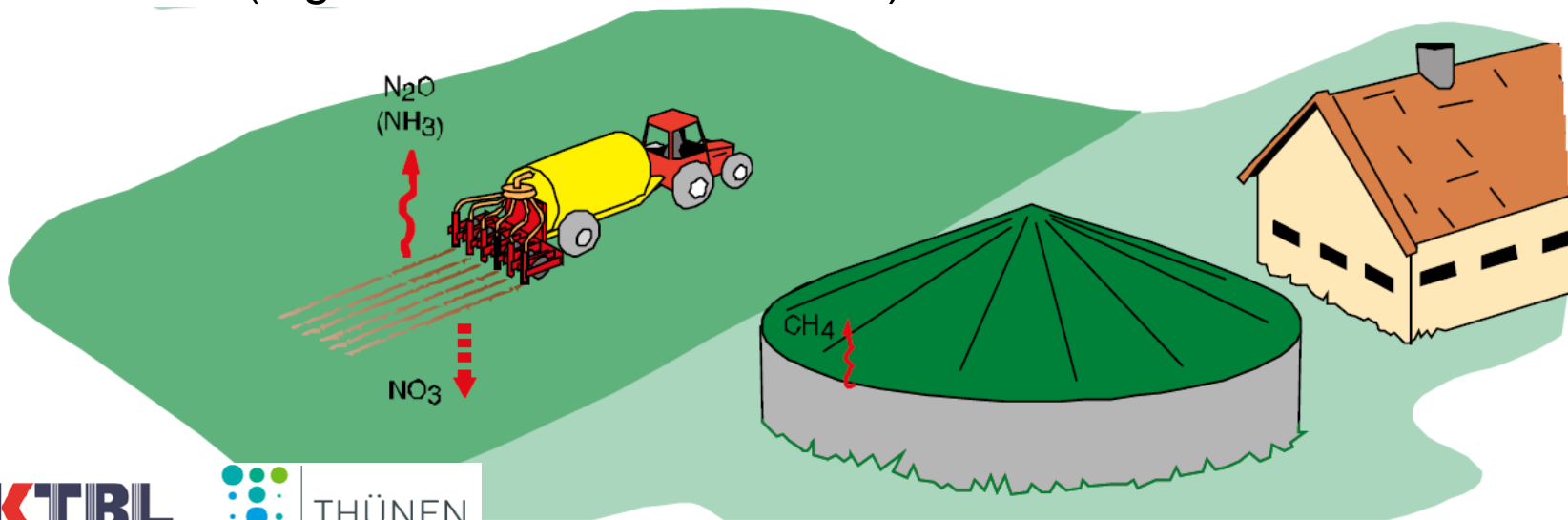
German NAPCP - With Additional Measures Scenario (WAM)



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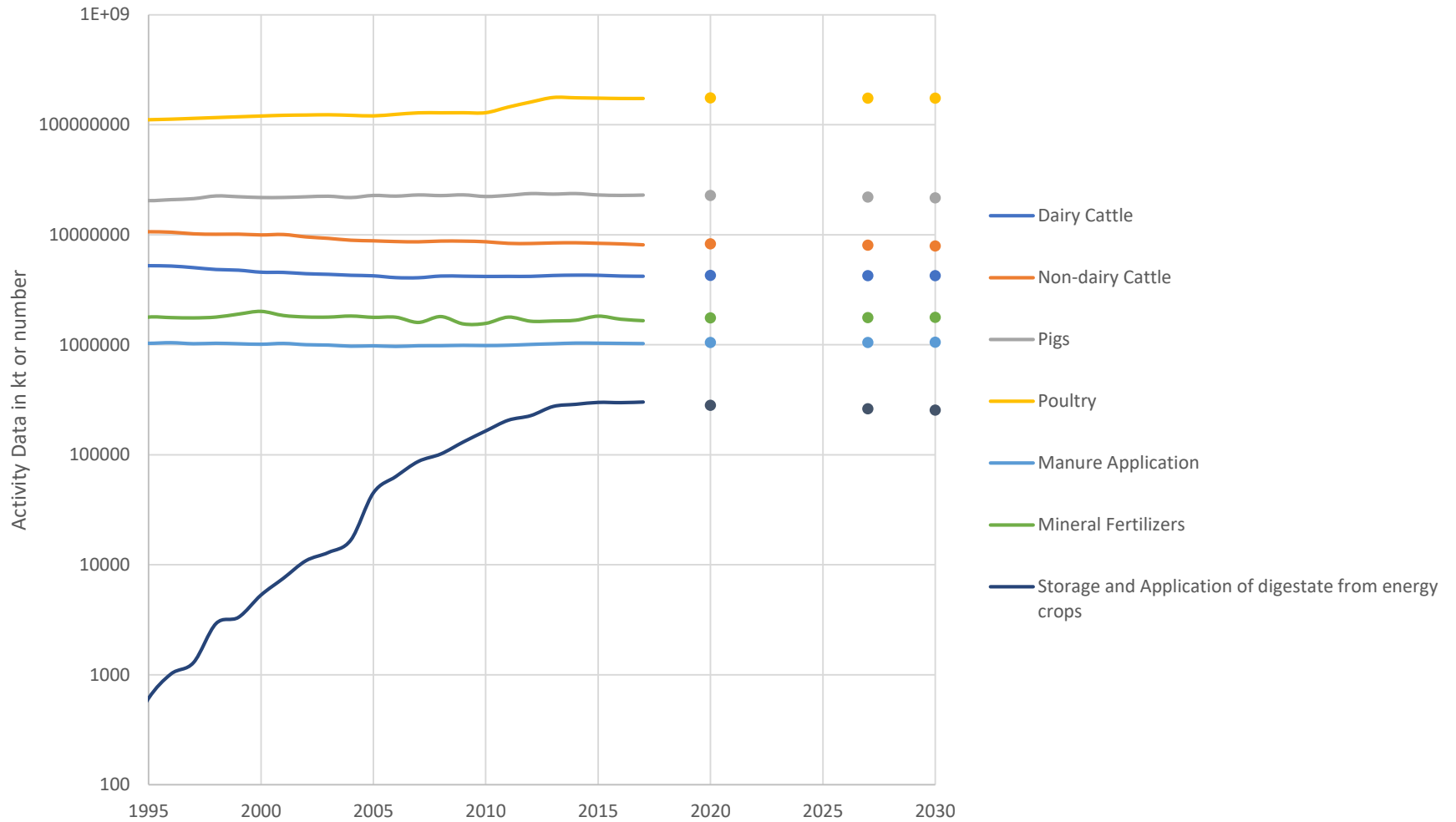
+ measures to keep N₂O emissions and N-Input in soils at least constant

- optimized nutritional management to reduce N-excretion
- Reduction of the total N-balance surplus by 20 kg N / ha to reduce additional application of synthetic N-fertilizers
- risk of higher GHG-emissions was assessed as low, assessment is difficult (e.g. lack of emission factors)



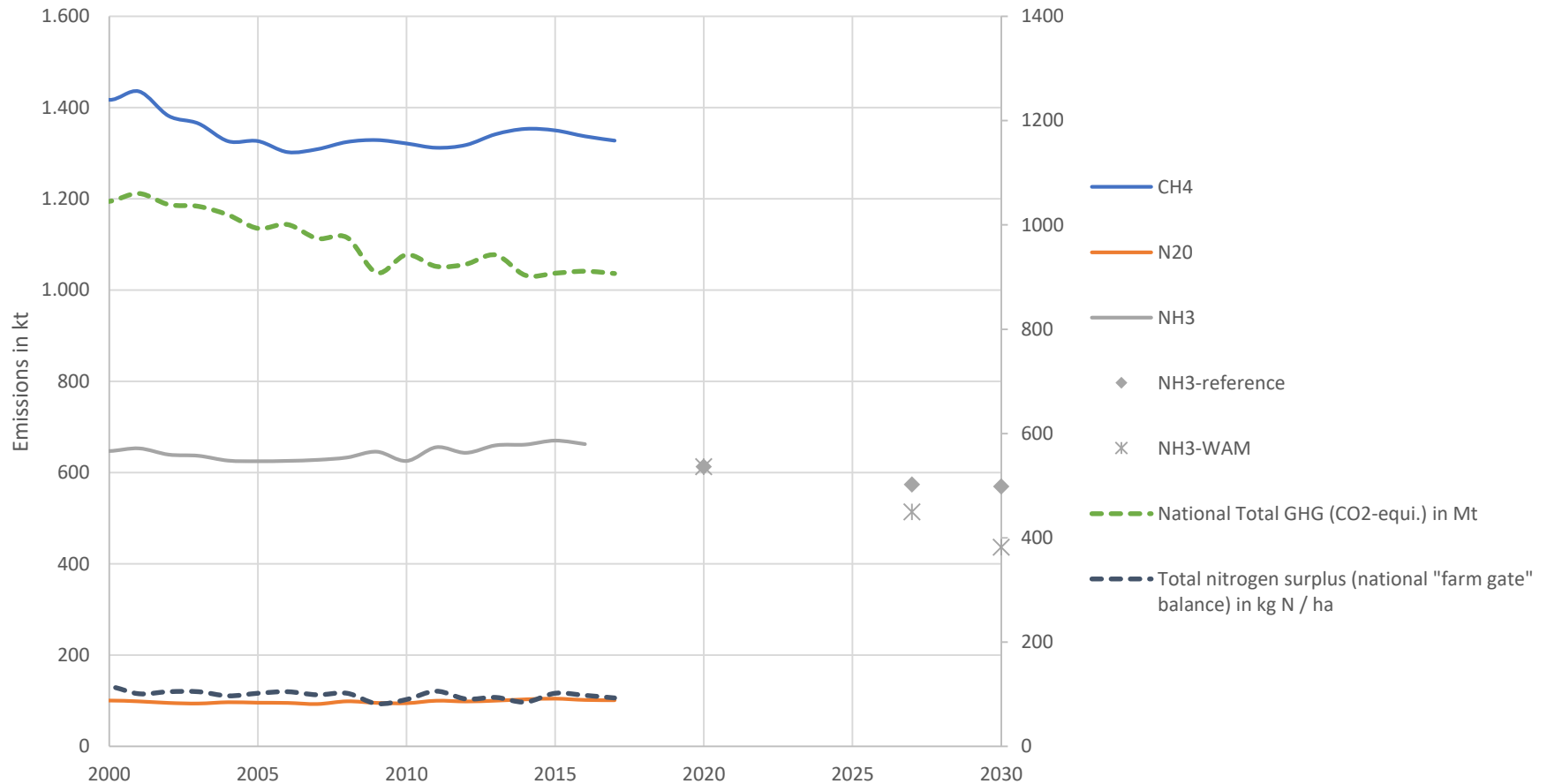
German Agriculture – Activity Data

Activity Data in German Agriculture 1995-2030



German Agriculture – losses in atmosphere and soils (emissions)

N₂O, CH₄ emissions 2000-2017 (submission 2019) and NH₃ emissions 2000-2030 (NAPCP) from Agriculture (NFR 3) in kt + national total GHG emissions in Mt (in CO₂ equi.) + total nitrogen surplus in kg N / ha (national farm gate balance)



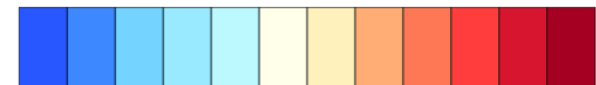
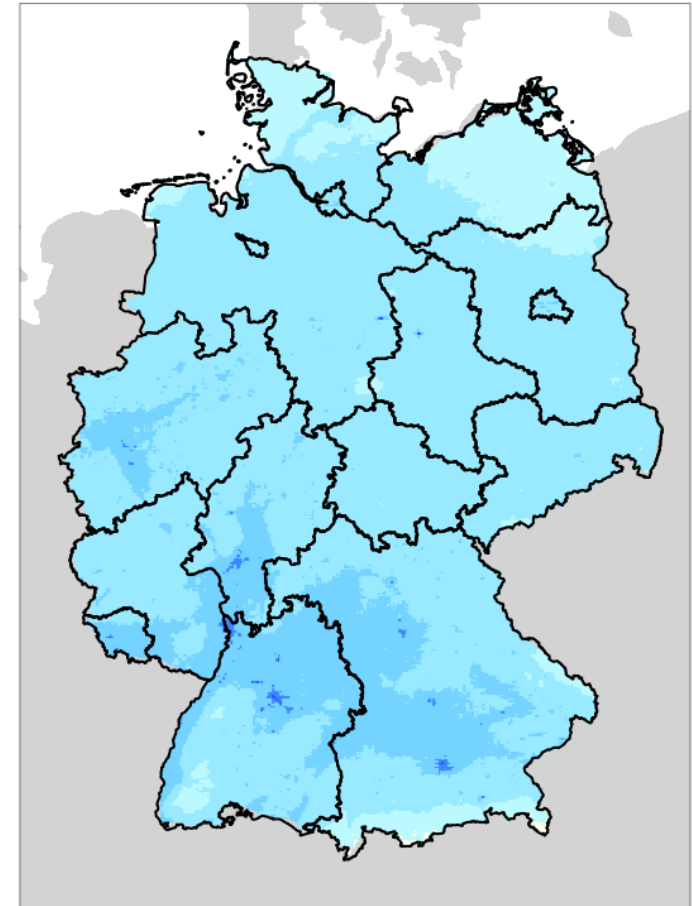
To Take Home (Holistic Approach?)

- **Ammonia reduction helps reducing PM background concentrations in cities.**
- **Use synergies of agricultural measures in the fields of Clean Air, Clean Water and Climate Protection.** (This means not only avoiding negative interactions.)
- **Develop multi-scale policies to**
 - push circular economy (local to regional),
 - regulation of animal number per hectare,
 - reduce consumption of animal products (meat, milk, eggs, etc.) (national to global).

Absolute Difference necc2030 - 2005

PM2.5

$\mu\text{g}/\text{m}^3$



-10 -8 -6 -4 -2 0 2 4 6 8 10

Thank you very much for your attention!

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<http://www.umweltbundesamt.de/en/topics/air>