Ammonia Mitigation of Hungarian pig farms

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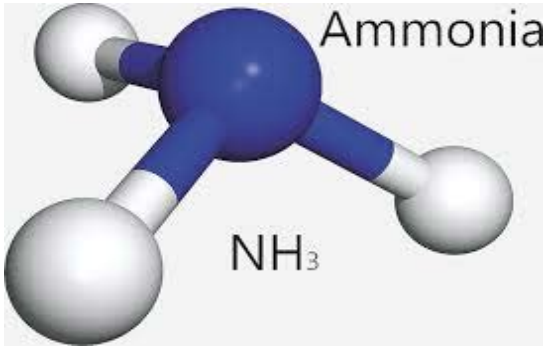
Why is ammonia an important air polluter?



94 % of ammonia emission in EU comes from agricultural production

(manure storage, slurry application, fertilizer use)

Acid rains

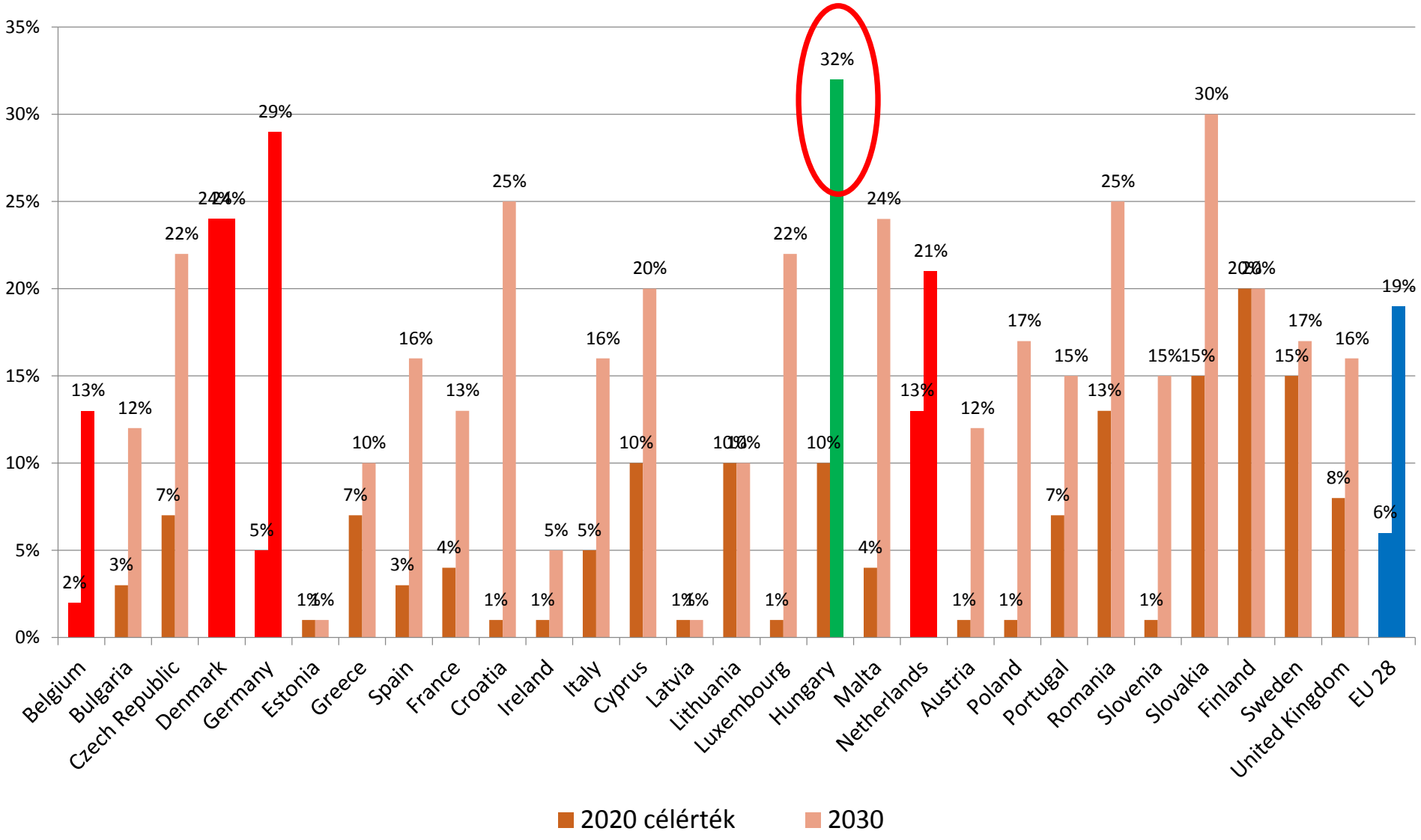
Eutrophication

Soil Acidification

National Emissions Ceilings (NEC) Directive (2016/2284/EU)

- Sets national emission reduction commitments for Member States for air pollutants
- Reporting obligations for Member States
  - Emission Inventories (every year)
  - Informative Inventory Report (every year)
  - Projected emissions (everey 2 years)
- National air pollution control programmes – by 1 April 2019
- Careful selection of Policies and Measures (PaMs)

NEC Directive ammonia emission reductions (2020 and 2030)

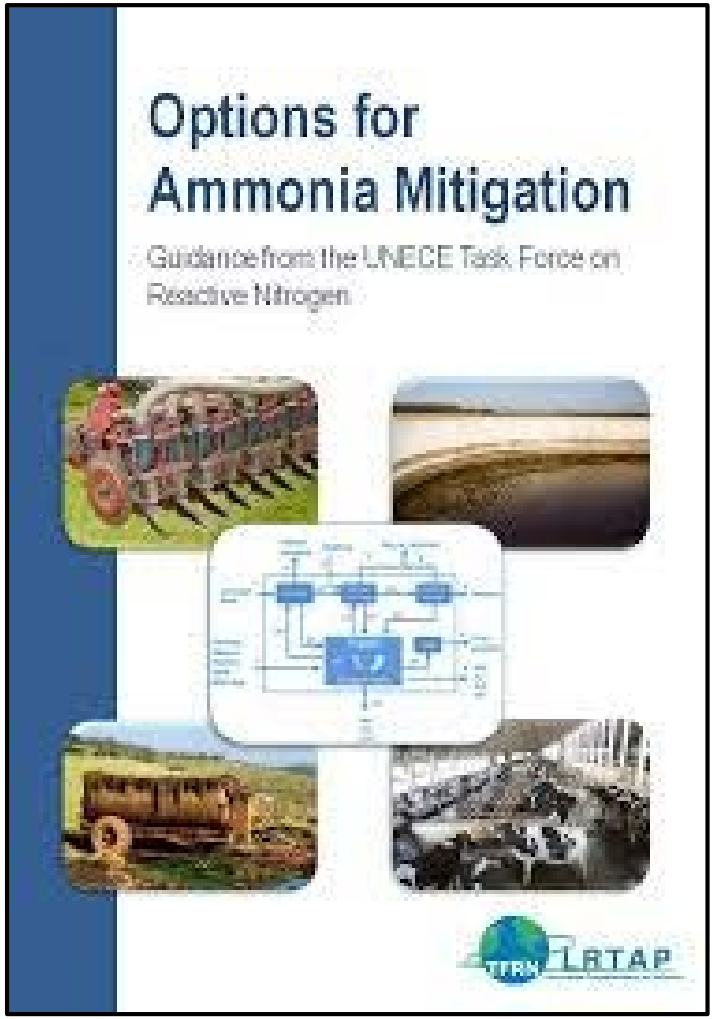


Modeling Policies and Measures (PaMs) for ammonia reduction

- Funding: National Research Programme for **pig sector**

- Has a 25 % share of ammonia emission in Hungary
- Which PaMs are the most effective for ammonia reduction in the sector?
- How much do they cost for the farmers? (investments and variable costs)
- How much do they cost for the national budget?

Policies and Measures (PaMs) for ammonia reduction



Livestock feeding

Livestock housing

Manure storage

Manure application

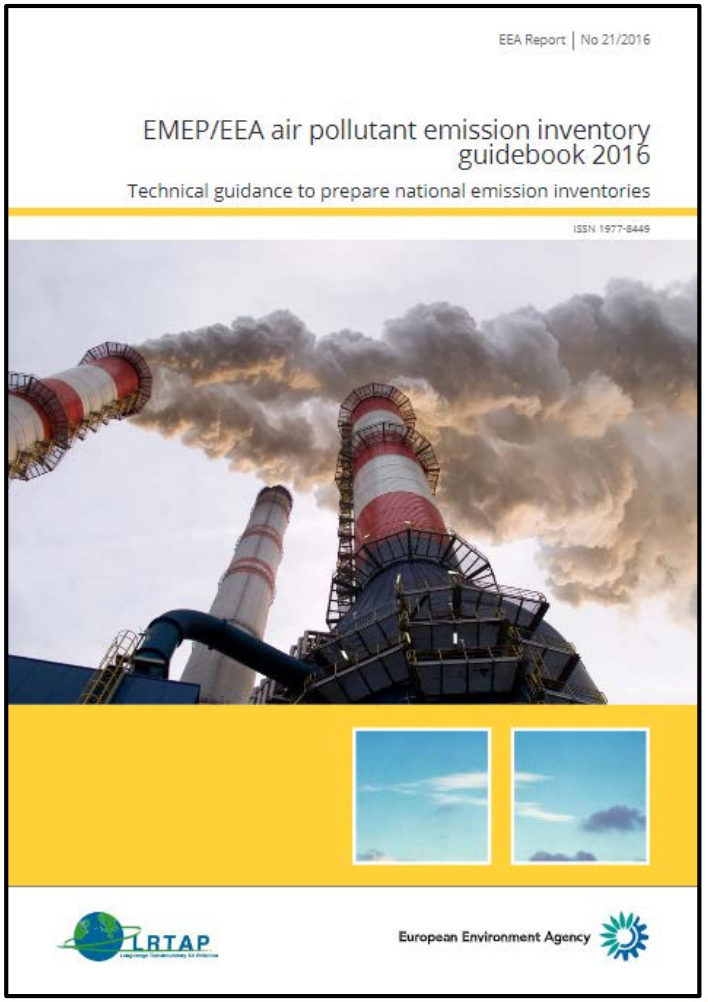
Fertilizer application

How can we use FADN database for ammonia estimation?

- Additional data collection on a FADN sub-sample
  - 150 pig farms
  - Feeding
  - Housing
  - Manure management
- Farm level estimation of ammonia emissions

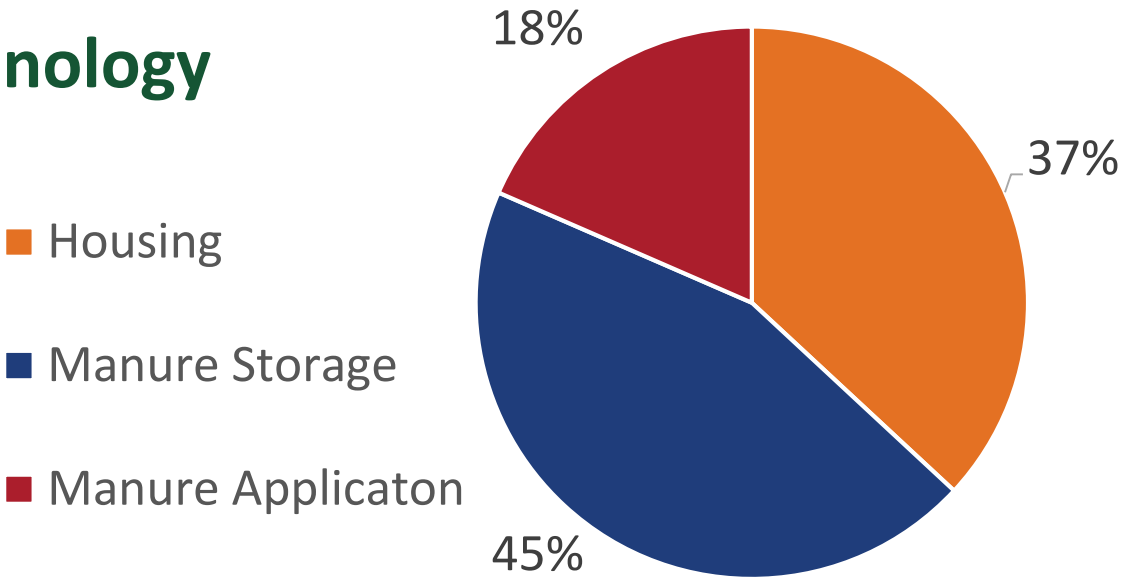
  (EMEP/EAA Guidebook)
- Farm level emission reductions

  (Options for ammonia mitigation)

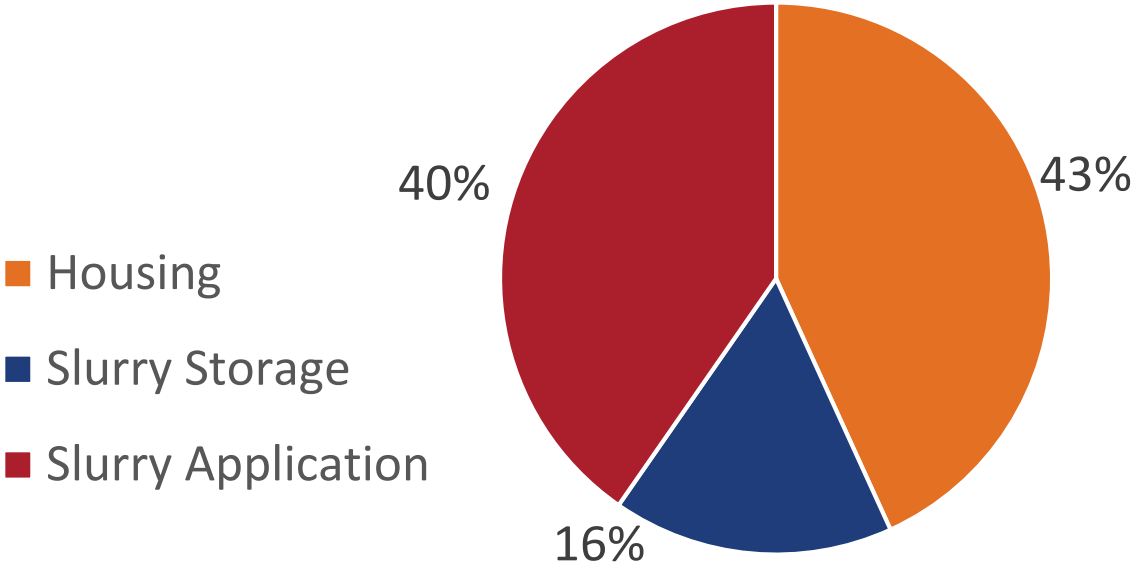


Source of ammonia emissions

Solid manure based technology



Slurry based technology

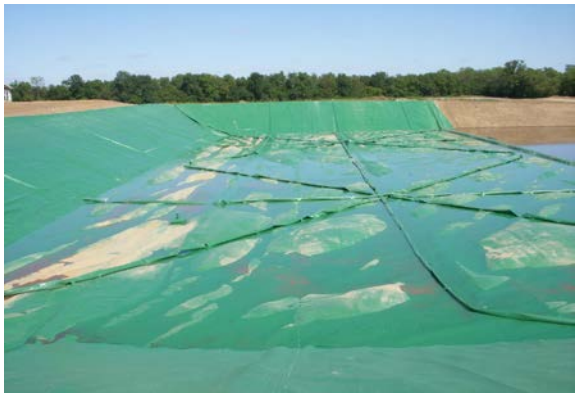


Slurry and solid manure application

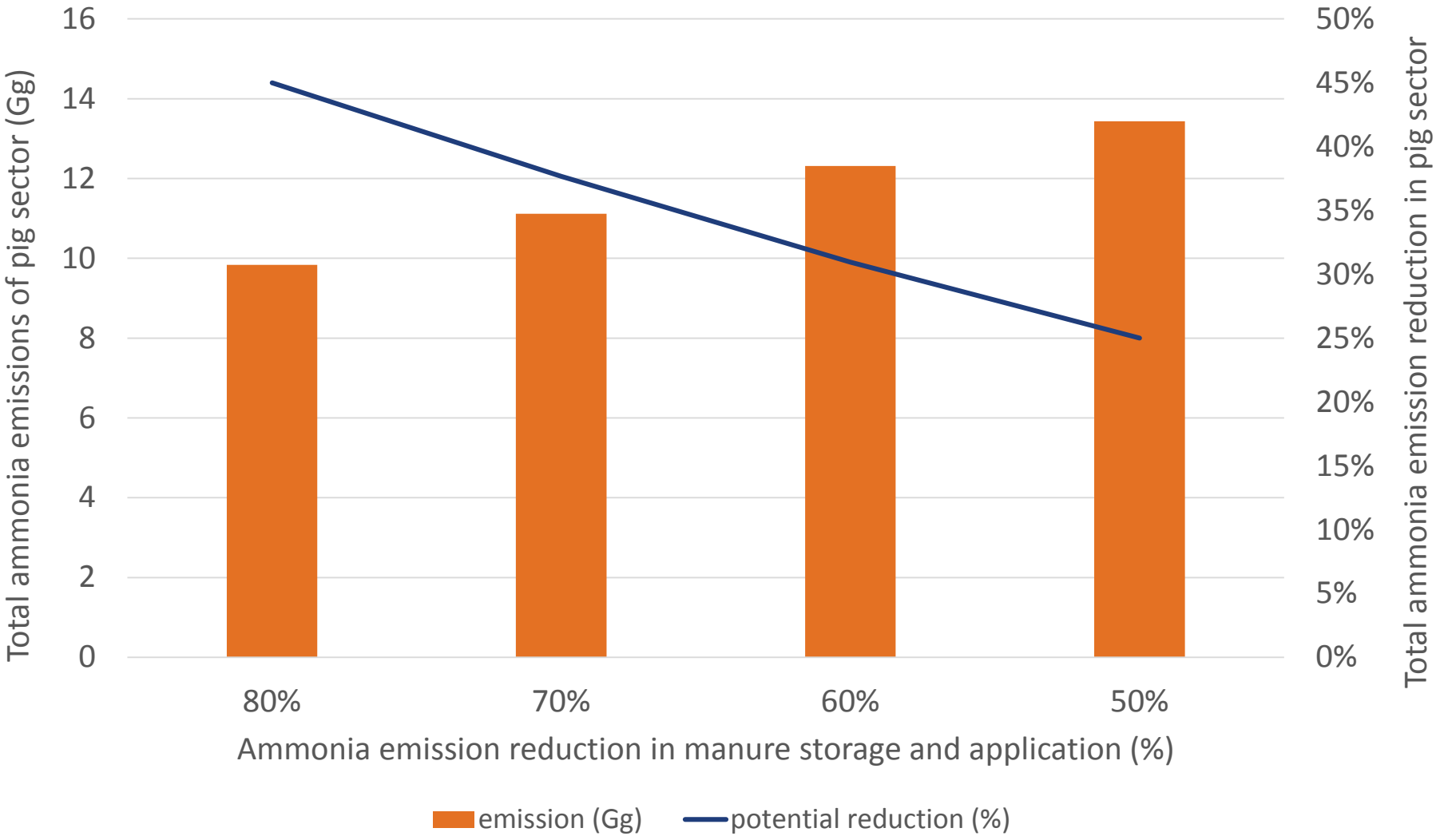
- **Baseline:** spraying and incorporation after several days
- Injecting slurry
- Immediate incorporation of surface applied slurry
- **25% emission reduction** of pig farms

Manure storage

- Baseline: isolated, uncovered (RDP funded 2007-2010
- Slurry and Solid manure floating covers
- **45% emission reduction** of pig farms (together with manure application)
- 1+1≠2 in ammonia reduction



Impact of manure management and manure application measures to the emissions of pig sector



Estimated cost of emission reduction

- Under contstruction at this time
- Price of technologies available on the market
  - Slurry injecting machines
  - Manure storage floating covers
- Estimated cost of immediate incorporation of applied manure and slurry
- Modeling of emissions in 2030
  - Emissions: National Inventory Report
  - Costs: FADN
- Cross Compliance Rules and RDP investment subsidies

Thank you for your attention!