

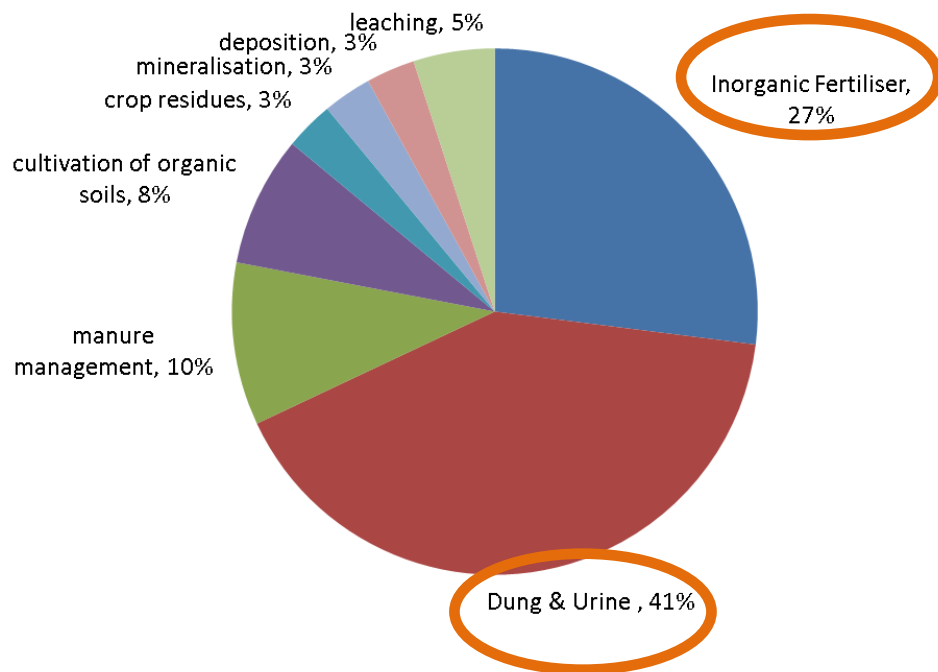


# New emissions profile of Irish agriculture and abatement potential

# National N<sub>2</sub>O

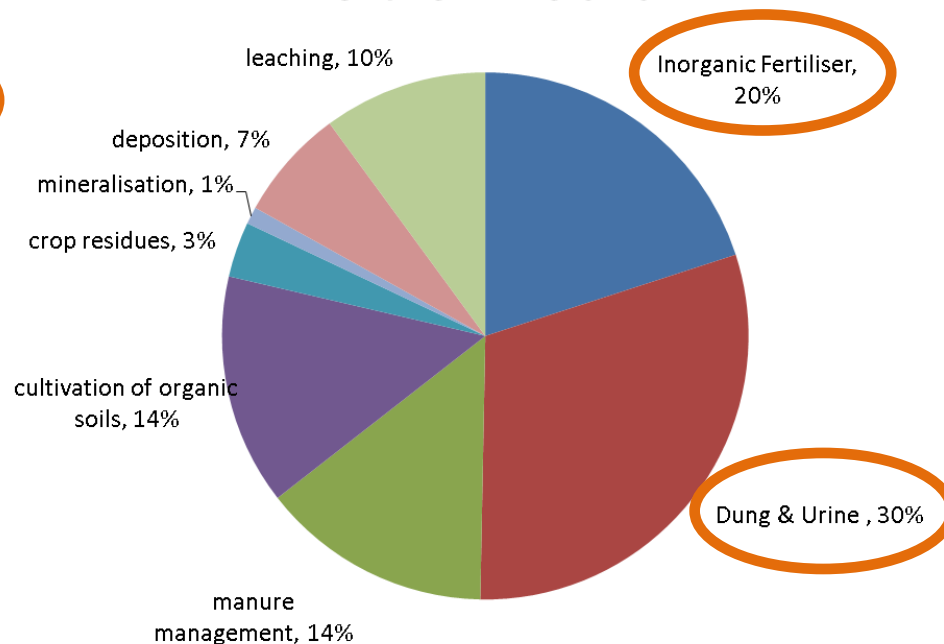
Sustainable Nitrogen Fertiliser  
Use & Disaggregated  
Emissions of Nitrogen

## Republic of Ireland



**Fertiliser+Dung/Urine 68%**

## Northern Ireland



**50%**

Data source: EPA, 2015

Data source: DEFRA, 2015

# Project Objectives

Sustainable Nitrogen Fertiliser  
Use & Disaggregated  
Emissions of Nitrogen

- AGRI-I: Refine N<sub>2</sub>O Emission Factors
  - Fertiliser ✓
  - Dung/urine ✓
  - Soil type/land-use ✓
  - Incorporate mitigation into inventories ✓
- SUDEN: Assess impact on
  - Agronomic Yield ✓
  - NH<sub>3</sub> emissions ✓



# IPCC Good Practice

- The largest sources accounting for 95% of emissions are key sources
- Higher tier methodologies should be used for Key Sectors
- Resources are focused on sources with significant impact on total emission estimate
- Best use of available resources
- Reduce uncertainties as much as practical
- **Tier 1** are simple methods with default values
- **Tier 2** are similar but with country specific emission factors and other data
- **Tier 3** are more complex approaches, possibly models. However should be compatible with lower tiers.
- Higher Tiers - need peer-reviewed science

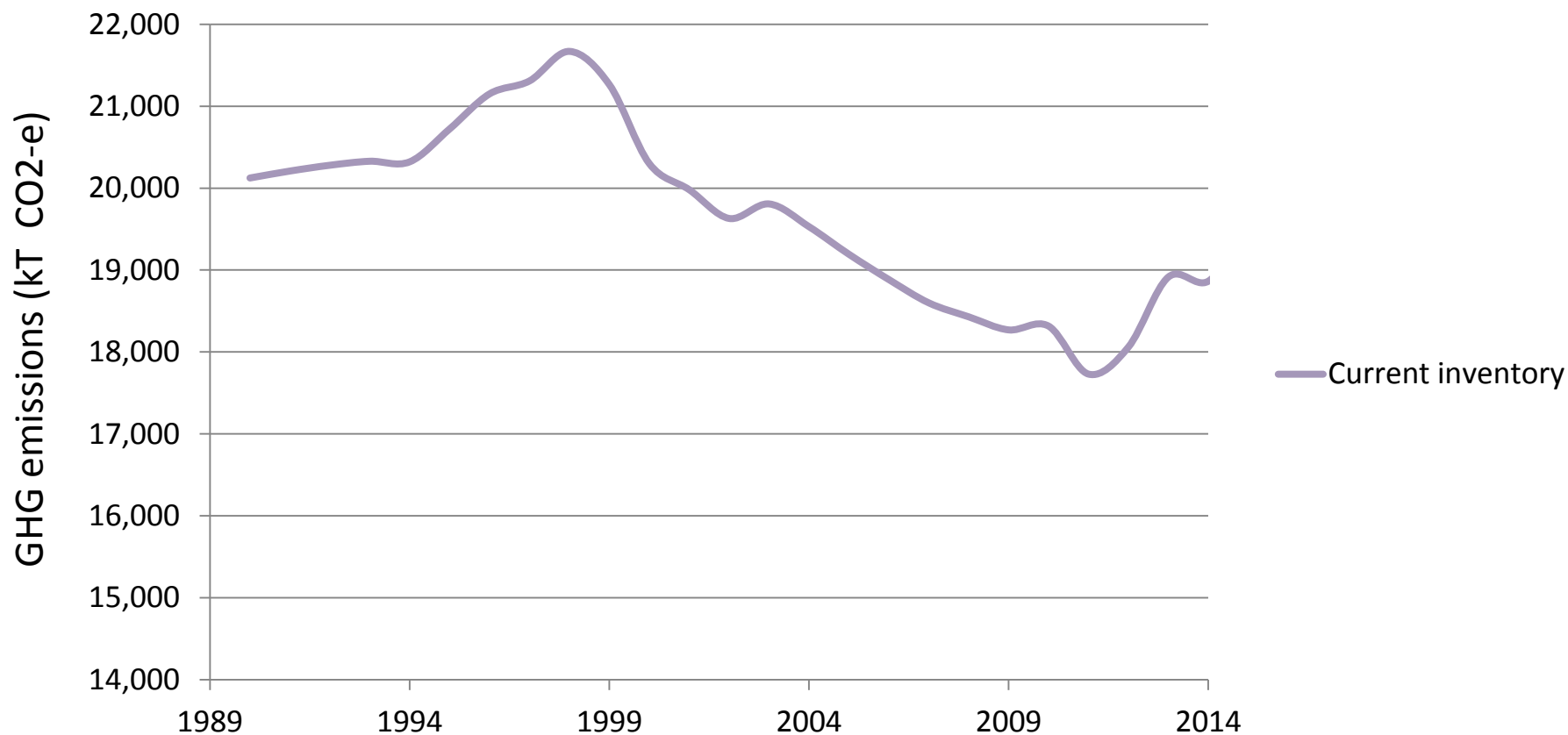


# Inventory Refinement

- Currently use Tier 1 emission factors for N<sub>2</sub>O
- Tier 1 does not disaggregate in terms of N type, soil type, rate or timing
- Tier 1 PRP does not differentiate between dung and urine



# Ireland's Agricultural Emissions Profile



# National Tier 2 N<sub>2</sub>O Emission Factors

Tier 1 (default):

Fertiliser = 1%

Pasture, range and  
paddock = 2%



Grassland	EF %
CAN	1.49
Urea	0.25
Urea+NBPT	0.4
Urea+NBPT+DCD	0.11
Dung	0.31
Urine	1.18
Arable	EF %
CAN	0.35
Urea	0.27
Urea+NBPT	0.2
Urea+NBPT+DCD	0.16

Harty et al. 2016 *Science of the Total Environment* 563, 576-586

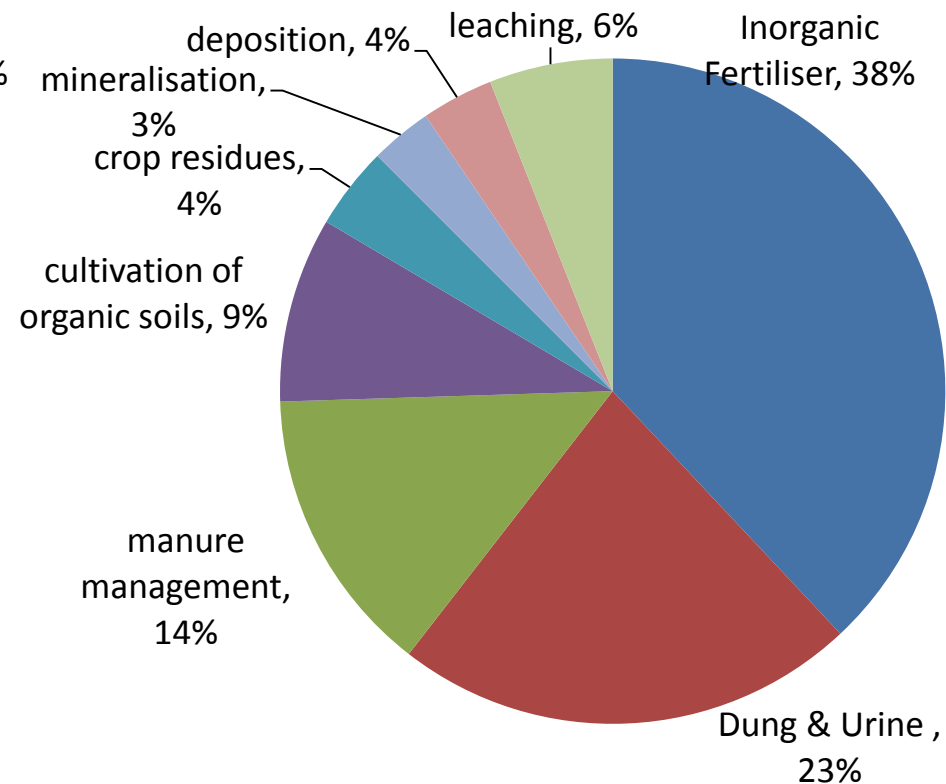
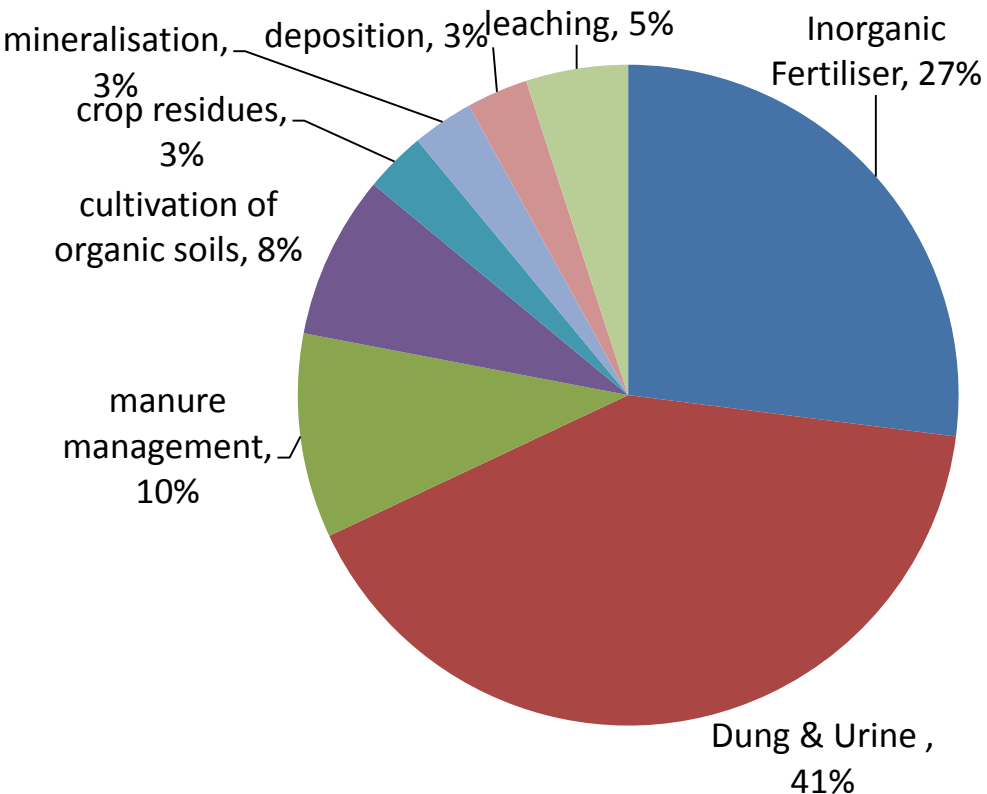
Krol et al. 2016 *Science of the Total Environment* (accepted)

Roche et al. 2016 *Ag. Ecosystems Environ.* (in review)

# Current emissions & Tier 2 emissions profile

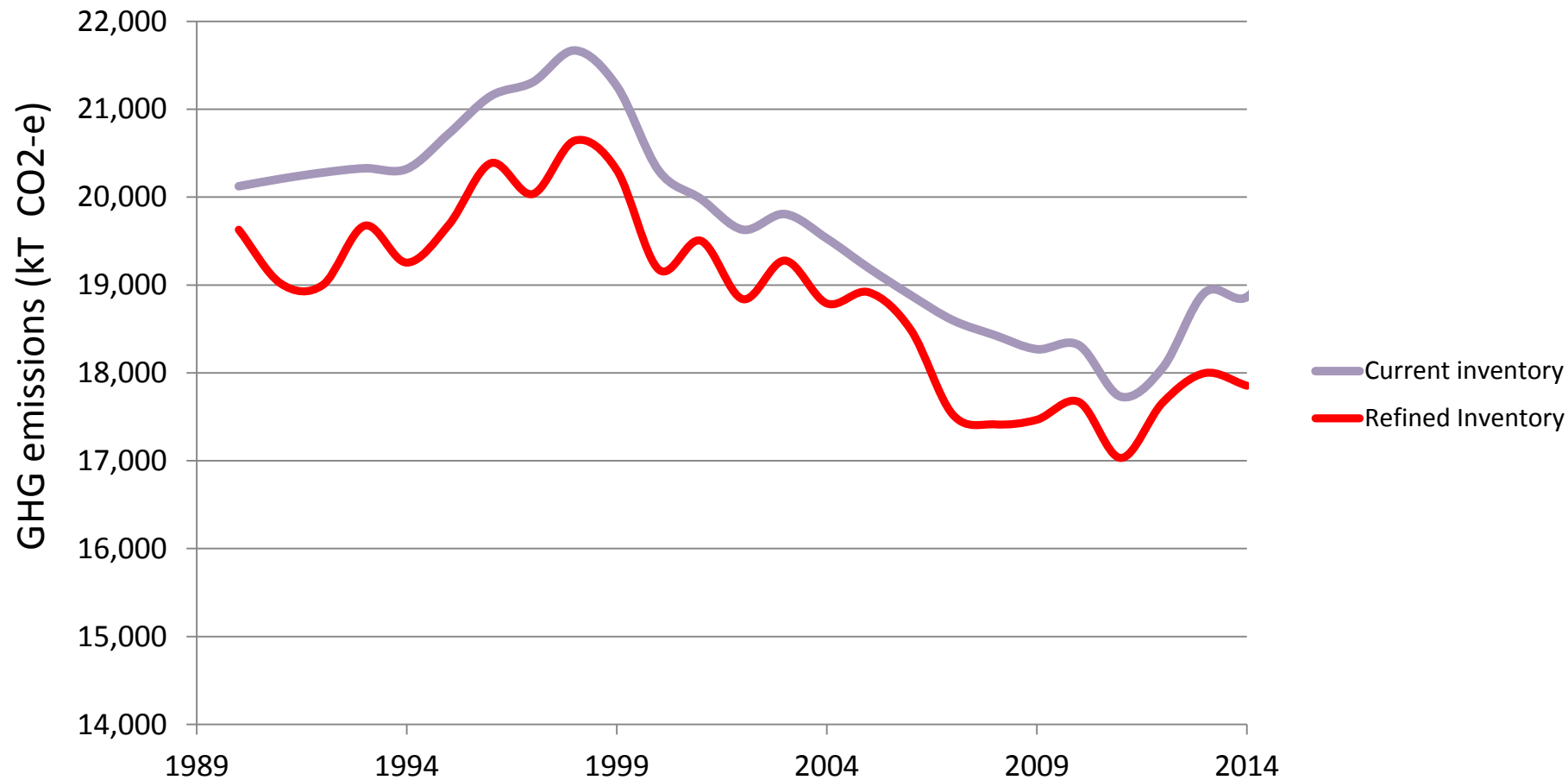
Inorganic fertiliser – share of emissions increases from 27% to 38%

Pasture, Range and Paddock (Dung/urine) – share decreases from 41% to 23%

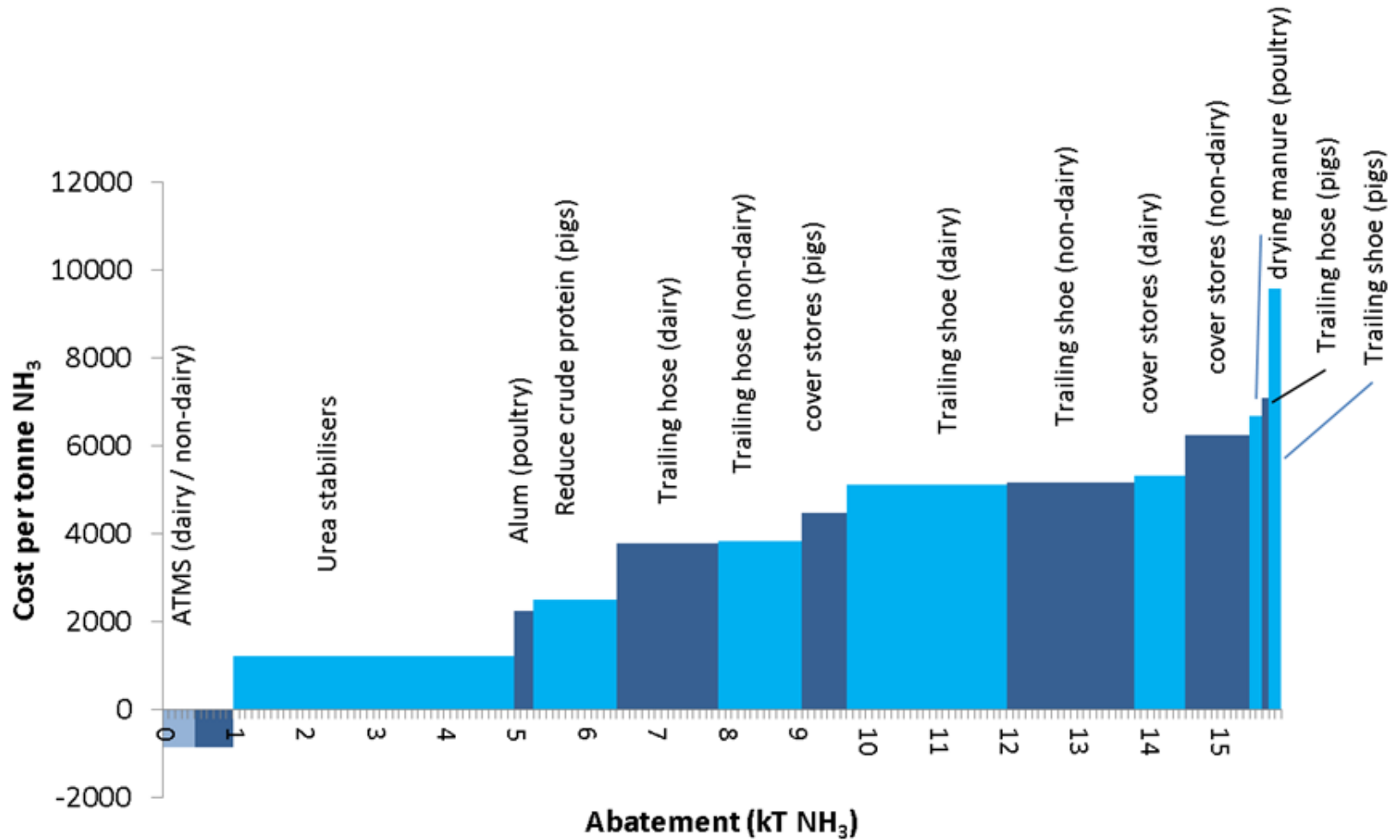




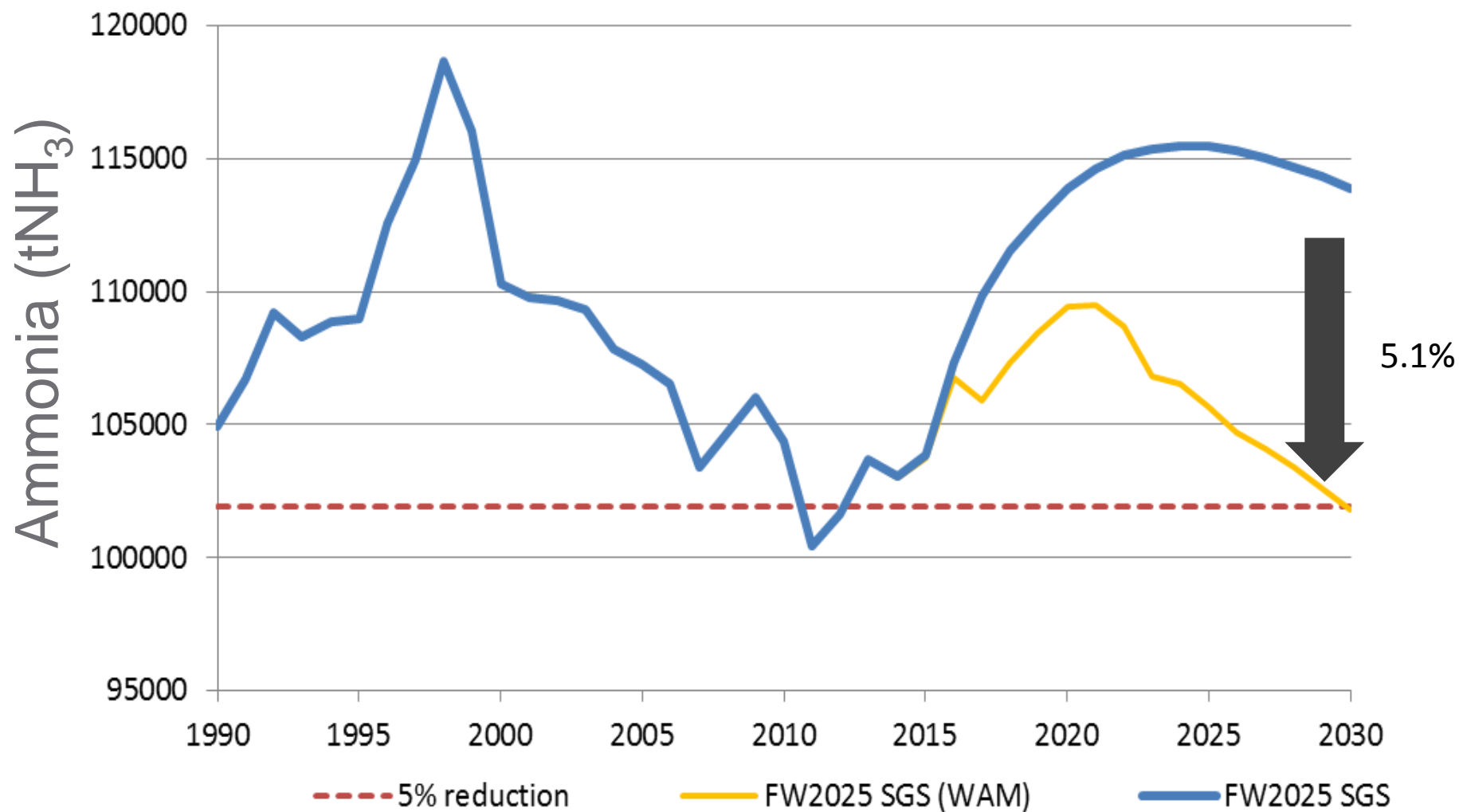
# Impact of Tier 2 N<sub>2</sub>O on emissions profile



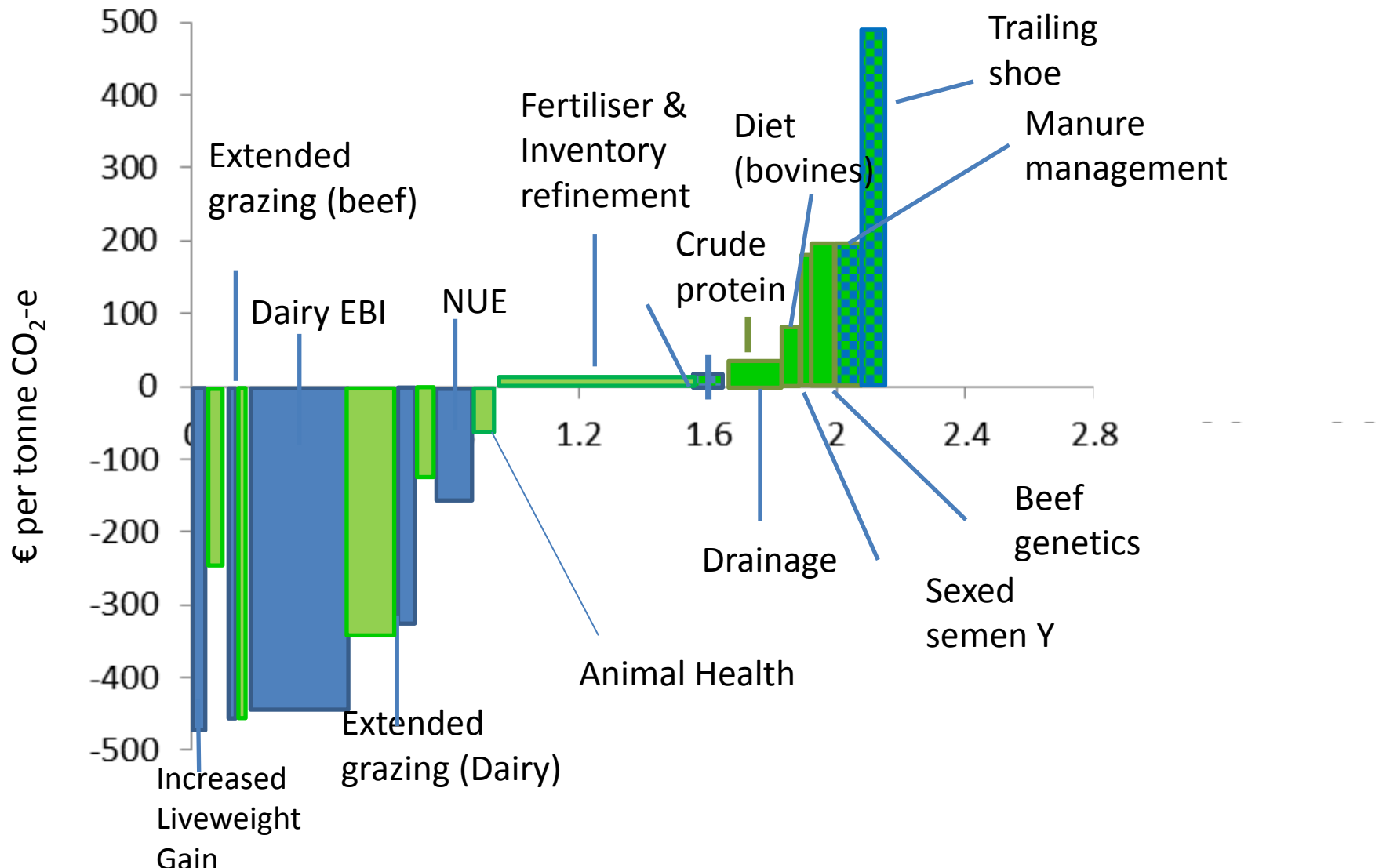
# Ammonia MACC (SGS)

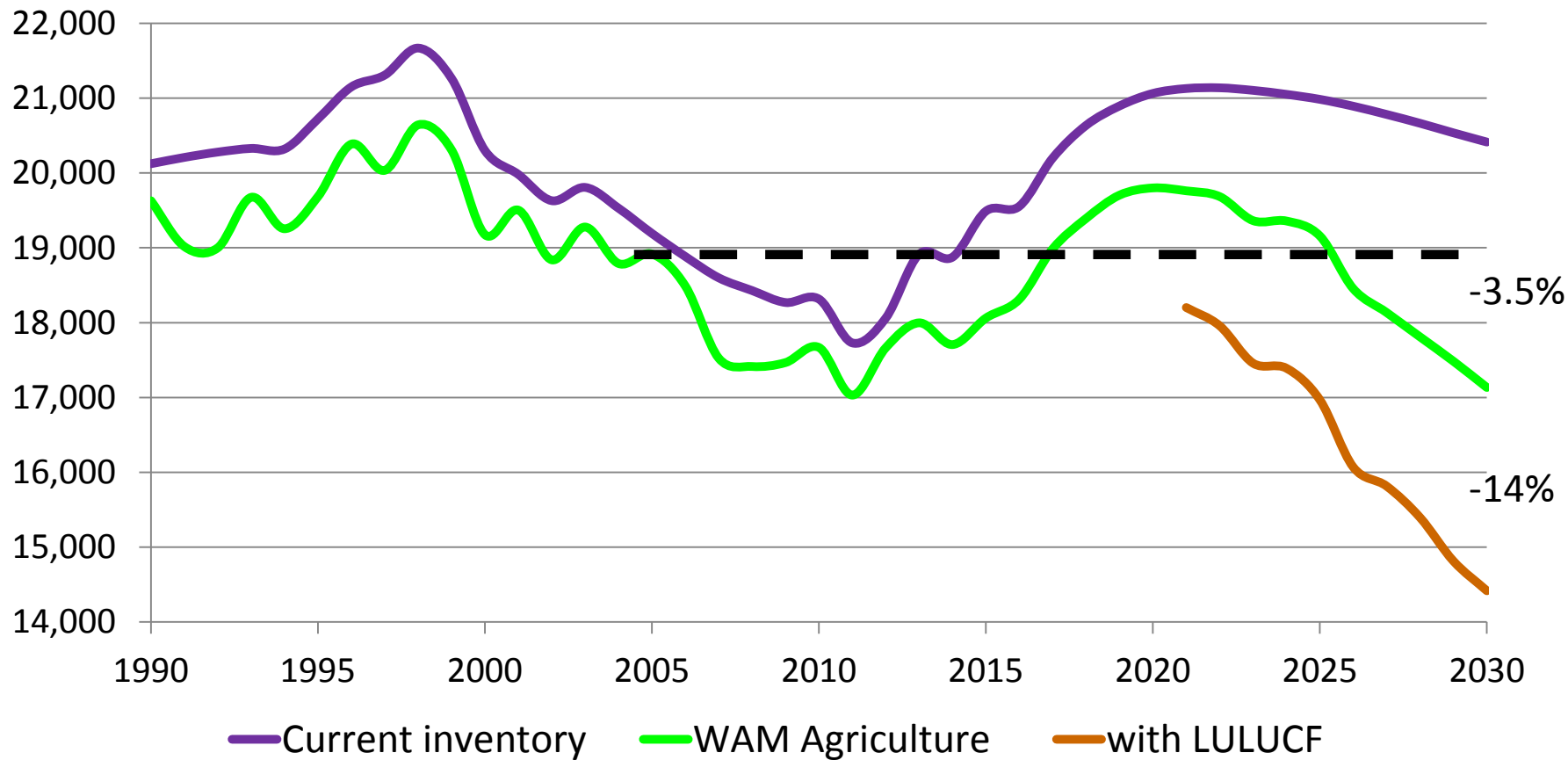


# Predicted ammonia emissions under FW 2025 scenarios, with and without ammonia abatement measures (WAM)



# MACC (2013-2030)







# Potential to reduce emissions

- Moving to higher Tier N<sub>2</sub>O reduces net emissions by 0.55 million tonnes CO<sub>2</sub>-e
- Shifting 45% of CAN to a stabilised urea product = Reduction of 0.56 million tonnes CO<sub>2</sub>-e
- Dissaggregation of dung and urine will allow for feed strategies to be included
- Shifting urea to a stabilised product will reduce ammonia emissions by 3 kT NH<sub>3</sub> - 25% of total potential abatement

# Thank you for your attention

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&

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