Outlook 2021 - Sustainability

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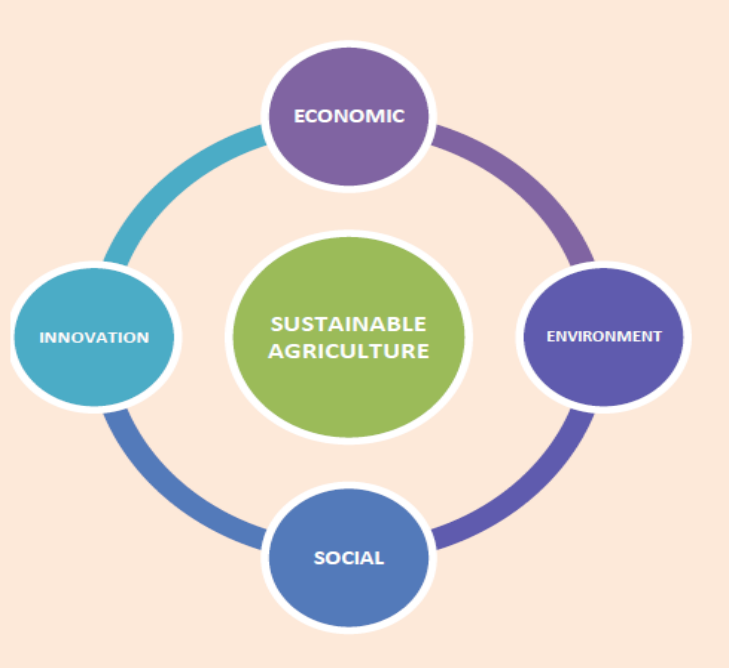
Overview

- Sustainability framework
- Methodology
- Projections for 2021
- Summary / conclusion

Sustainability Definition

- Farm level sustainability is intersection of:
  1. Economic
  2. Environmental
  3. Social
  4. Innovation

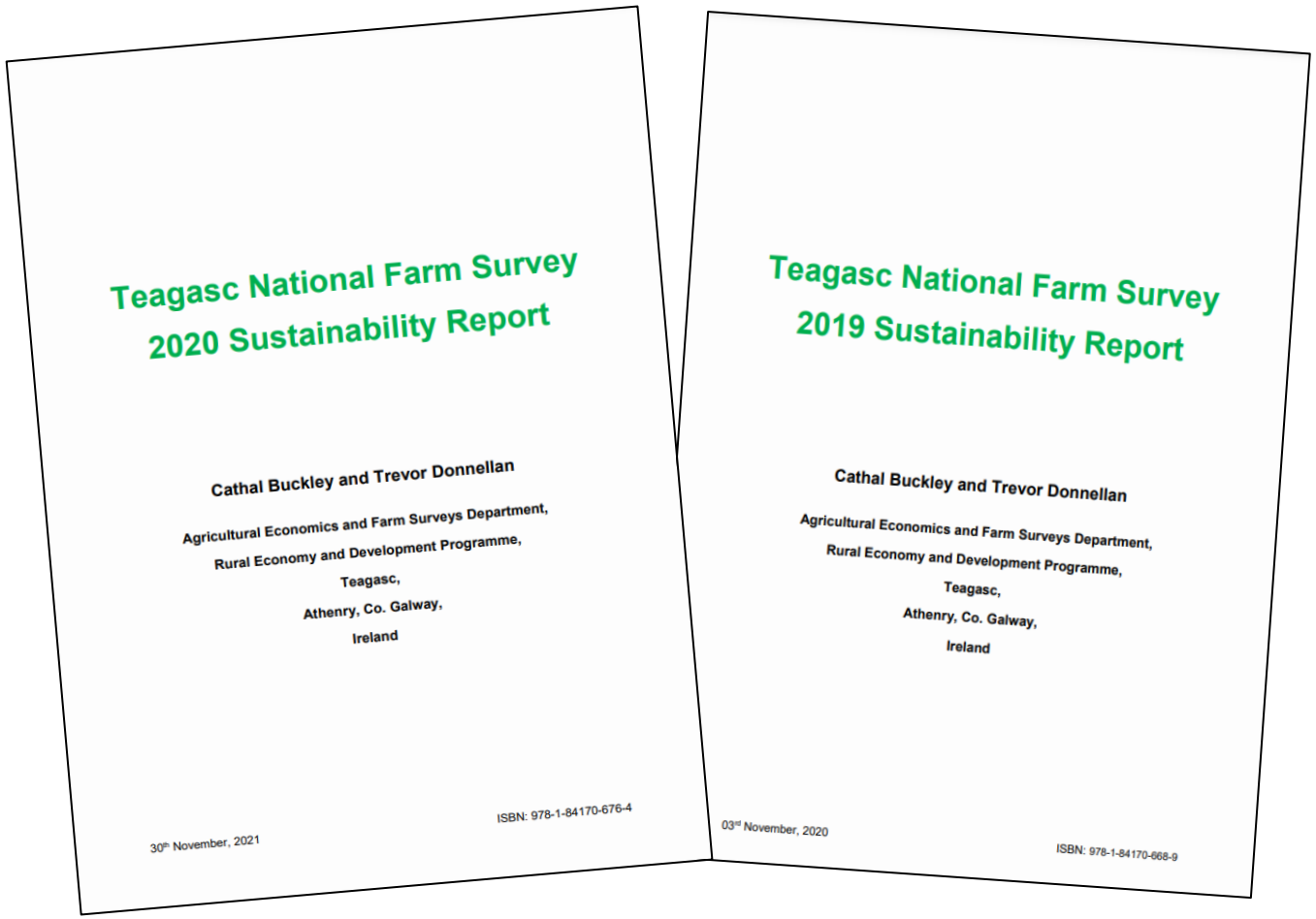


Success

Failure

Teagasc Sustainability Report Series

- Comprehensive range of results
  - 6 reports since 2013
  - 4 Farm Systems (Dairy, Cattle, Sheep, Tillage)
  - 4 Sustainability dimension
    - » Economic, Environmental, Social & Innovation
    - » 129 indicators for 2020 (most recent year)
  - Temporal
    - » Individual year results 2015 to 2020
      - 129 indicators x 6 years
    - » 3 year rolling averages 2013-2020 (longer term trend)



https://www.teagasc.ie/rural-economy/rural-economy/national-farm-survey/sustainability-reports/

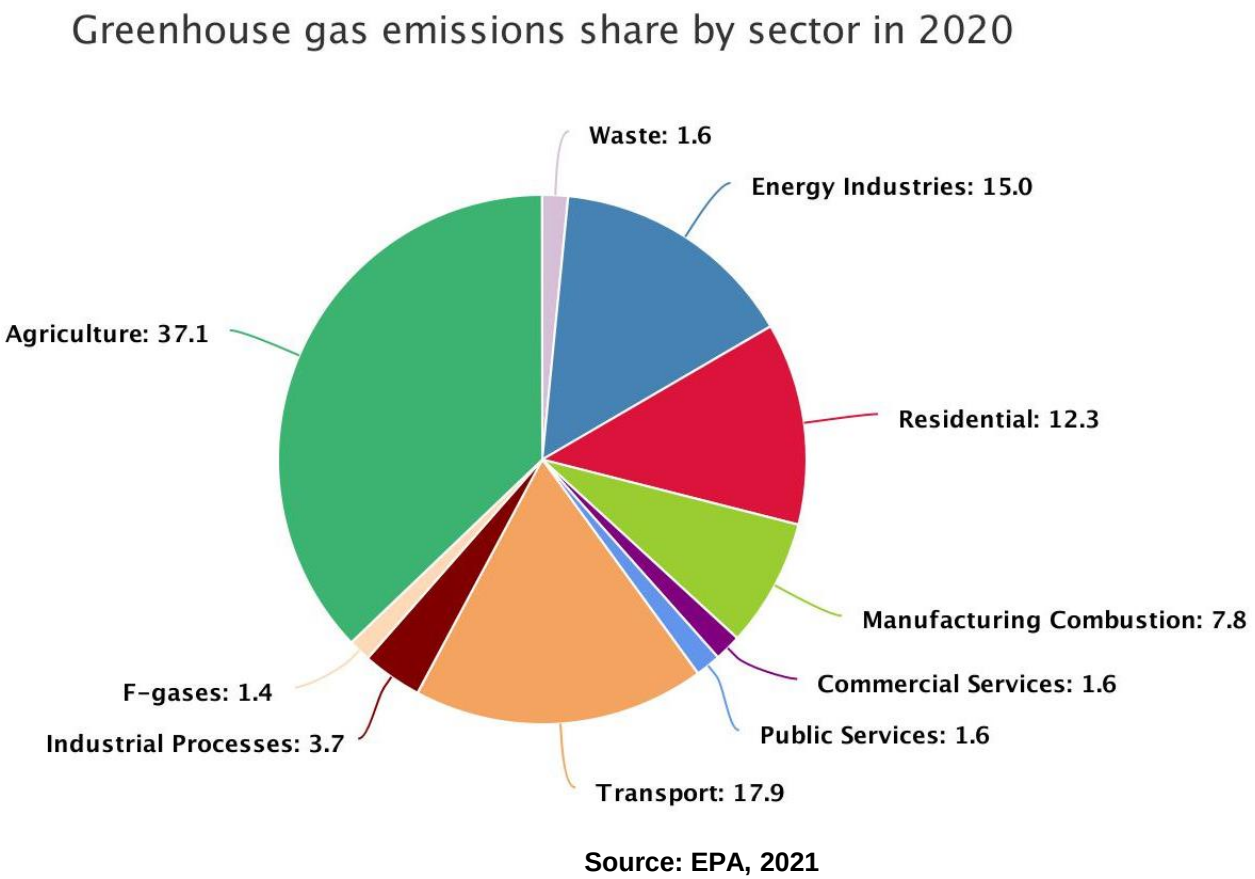
Environmental Sustainability

1. Gaseous Emissions
   - Greenhouse Gases
   - Ammonia

2. Risk to water quality
   - Use of nitrogen & phosphorus

3. Biodiversity Indicator
   - Under development - proof of concept

Gaseous Emissions - Agriculture



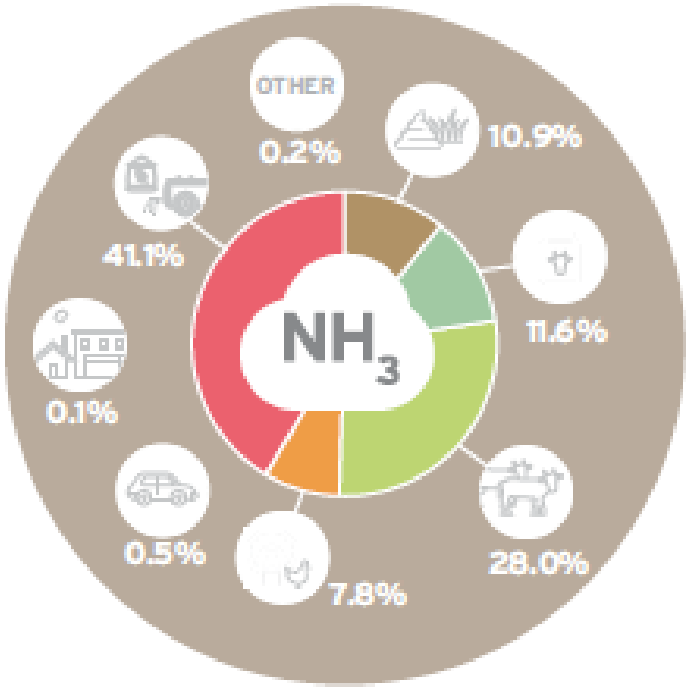
Source: EPA, 2021

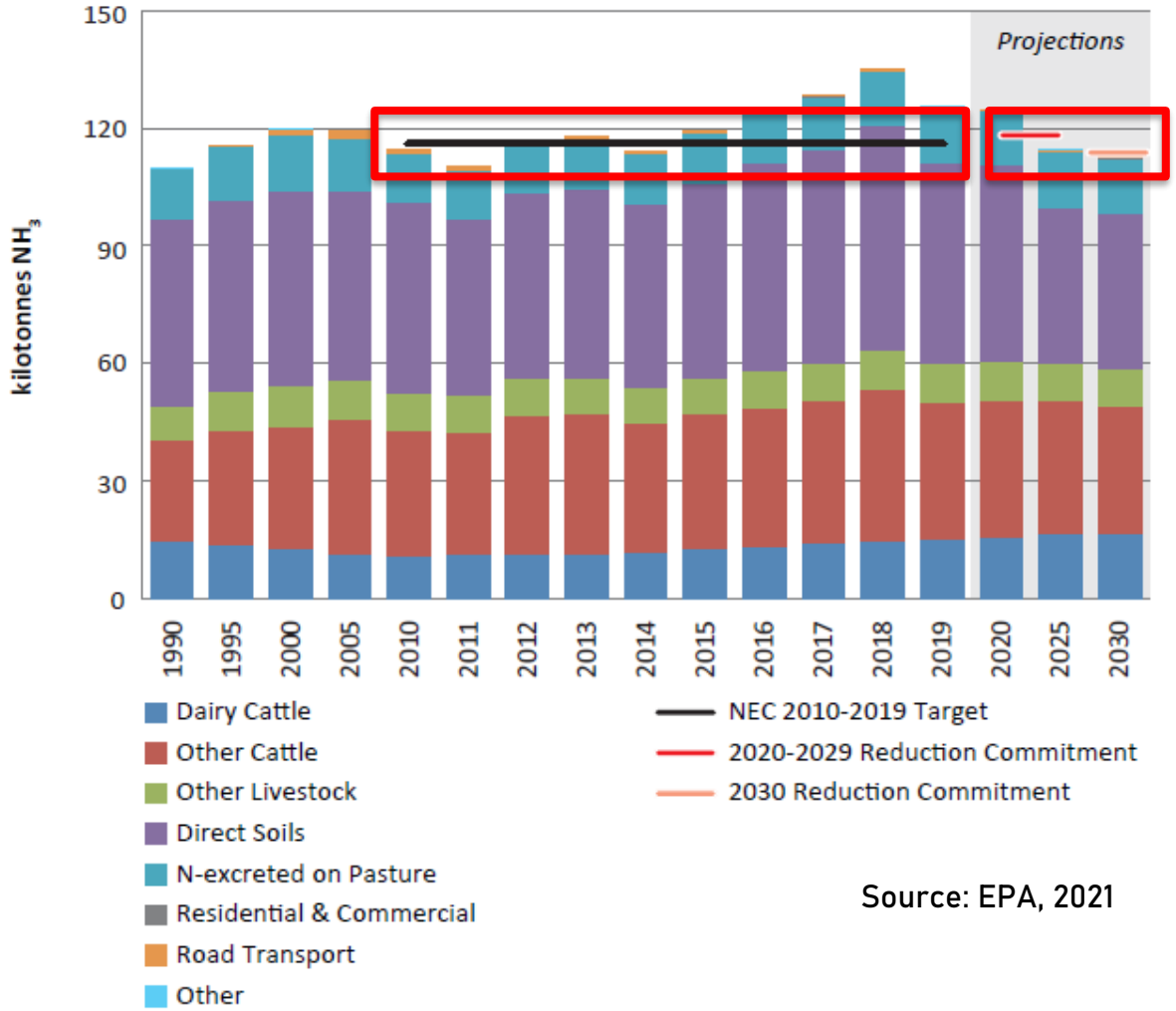
Climate Action Plan 2021: GHGs

- Sectoral GHG reduction targets for 2030 (compared to 2018)
  - Agriculture: 22 to 30%
  - LULUCF: 37 to 58%
- Carbon neutrality by 2050

Gaseous Emissions - Agriculture

99.4% of Ammonia Emissions generated from Agriculture (EPA, 2021)





Source: EPA, 2021

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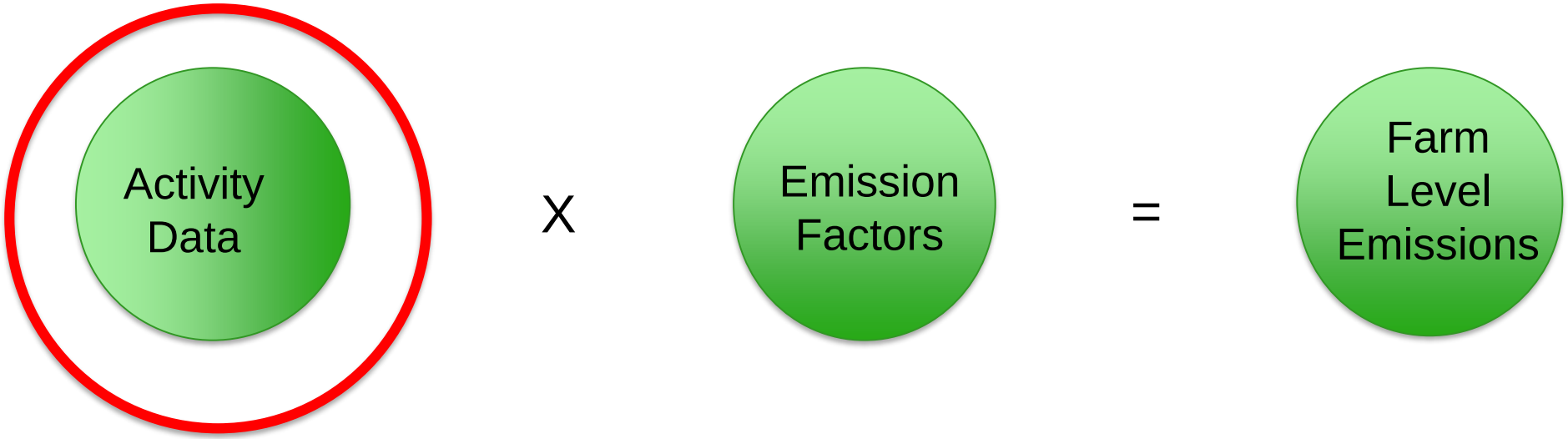
Emissions – How are they calculated

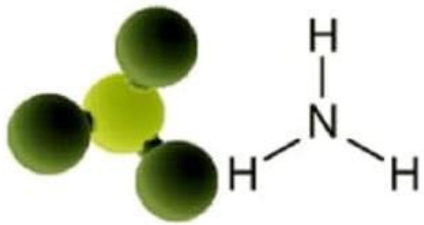


- Activity Data
  - Farm Practice (e.g. animal numbers, chemical fertilisers & manure management)
- Emission Factors
  - Scientific evidence from lab/field experiments, national level if possible (peer reviewed)

Methodological approach – Emission Factors

- GHG - All in common currency of CO_2 equivalence
  - » IPCC based national inventory approach for all farm types
  - » Replicating approach used by EPA at national level

- Ammonia (NH_3)
  - » National inventories approach for all farms
  - » Replicating approach used by EPA at national level for reporting under the EU NEC Directive



Methodological approach – Activity Data

- Activity data from Teagasc National Farm Survey
- NFS conducted by Teagasc since 1972 (part of EU Farm Accountancy Data Network)
  - Sample of 800+farmers representing over 91,000 nationally
- Data capture for environmental modelling
  - Animal numbers by category (e.g. Dairy Cows)
  - Crops grown (e.g. barley, wheat, oats)
  - Fertilisers applies (e.g. CAN, urea, protected urea)
  - Lime applied
  - Manure management practices (housing, storage, landspreading)
  - Technology Adoption

Activity Data Projections / Assumptions – 2021

1. Animal Inventories
   - CSO June survey 2020 vs 2021

2. Chemical Fertiliser Sales
   - Sales data DAFM Sept 2020-October 2021

3. Technology adoption –
   - Gaseous Emissions Mitigation
     - » LESS use to increase in line with historical trend

- Apply these changes to farms with the Teagasc NFS
  - Using 2020 as the base year

Cattle Numbers June 2020 vs 2021

Animal inventories	2020 vs 2021
Total cattle	0.61%
Dairy cows	2.35%
Other cows	-4.37%
Bulls	-3.45%
Cattle: 2 years and over	-10.06%
Cattle: 1-2 years	5.79%
Cattle: under 1 year	1.36%

Sheep Numbers June 2020 vs 2021

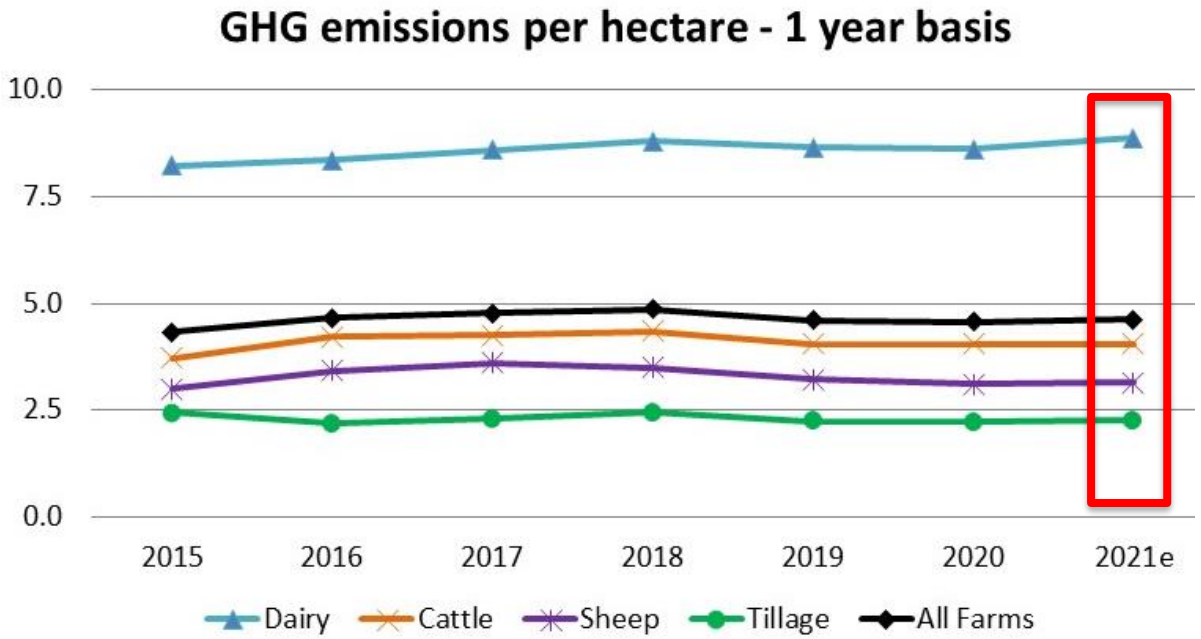
Animal inventories	2020 vs 2021
Total sheep	1.4%
Ewes	4.3%
Rams	0.2%
Other sheep	-1.4%

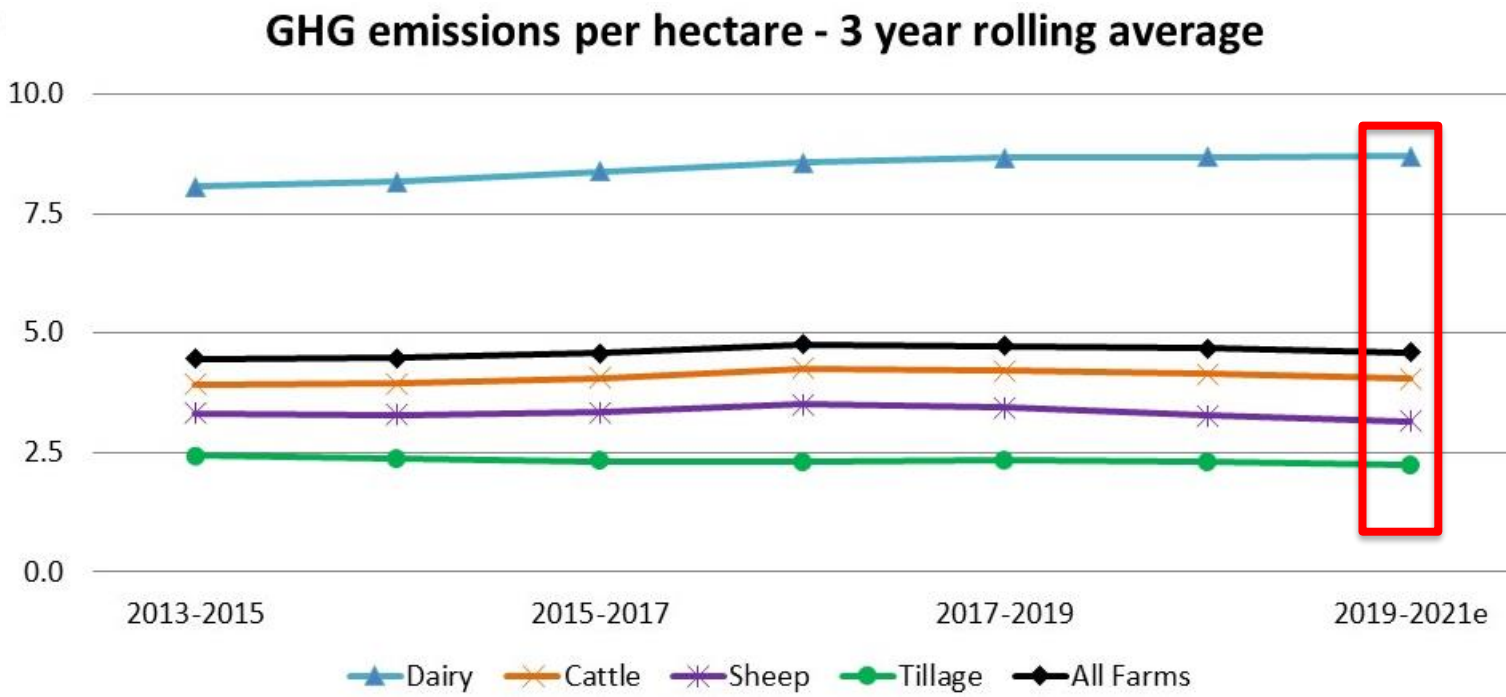
Chemical Fertiliser

	2020*	2021*	% change
Total	379,517	399,160	+5.2%
Straight CAN	122,167	140,127	14.7%
Straight Urea	43,976	40,687	-7.5%
Protected Urea	19,984	20,540	+2.8%
NK Compounds	3,600	2,947	-18.1%
NP Compounds	2,003	2,404	+20%
NPK Compounds	184,625	189,071	+2.4
Other N Fertilisers	3,162	3,384	+7.0

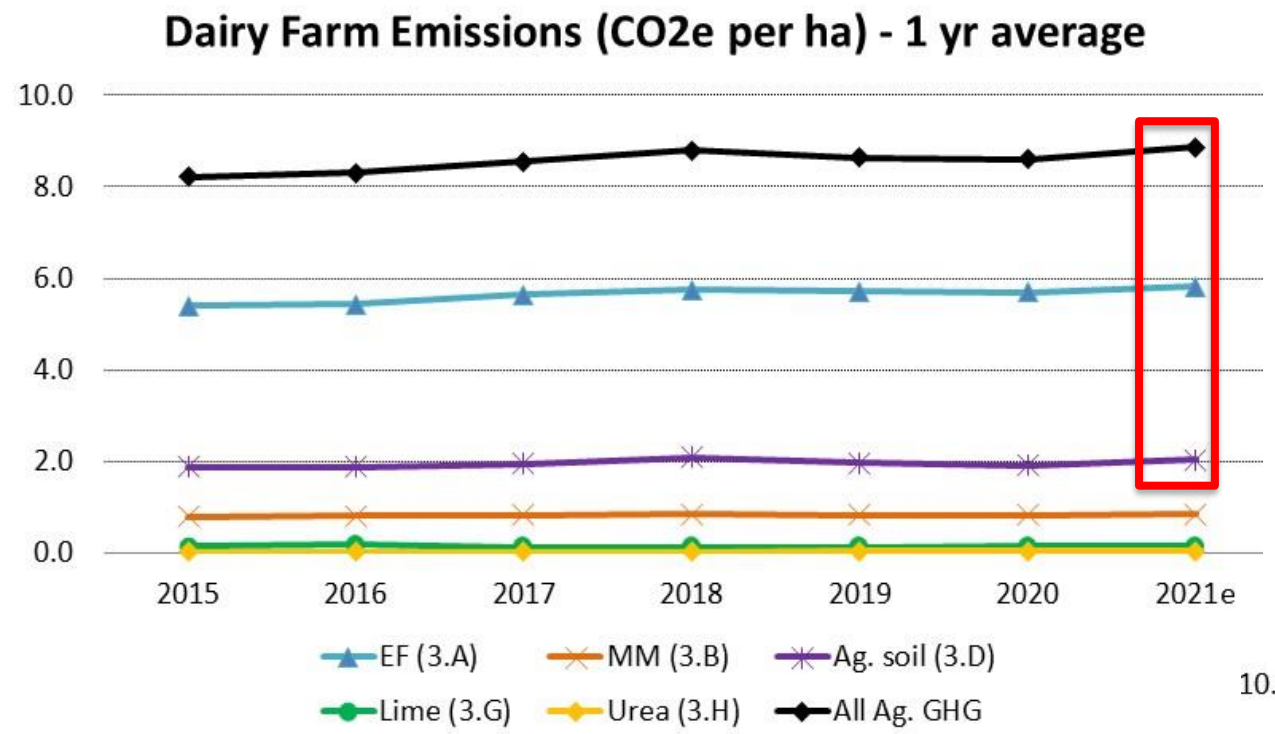
* September to October sales year (DAFM,2021)

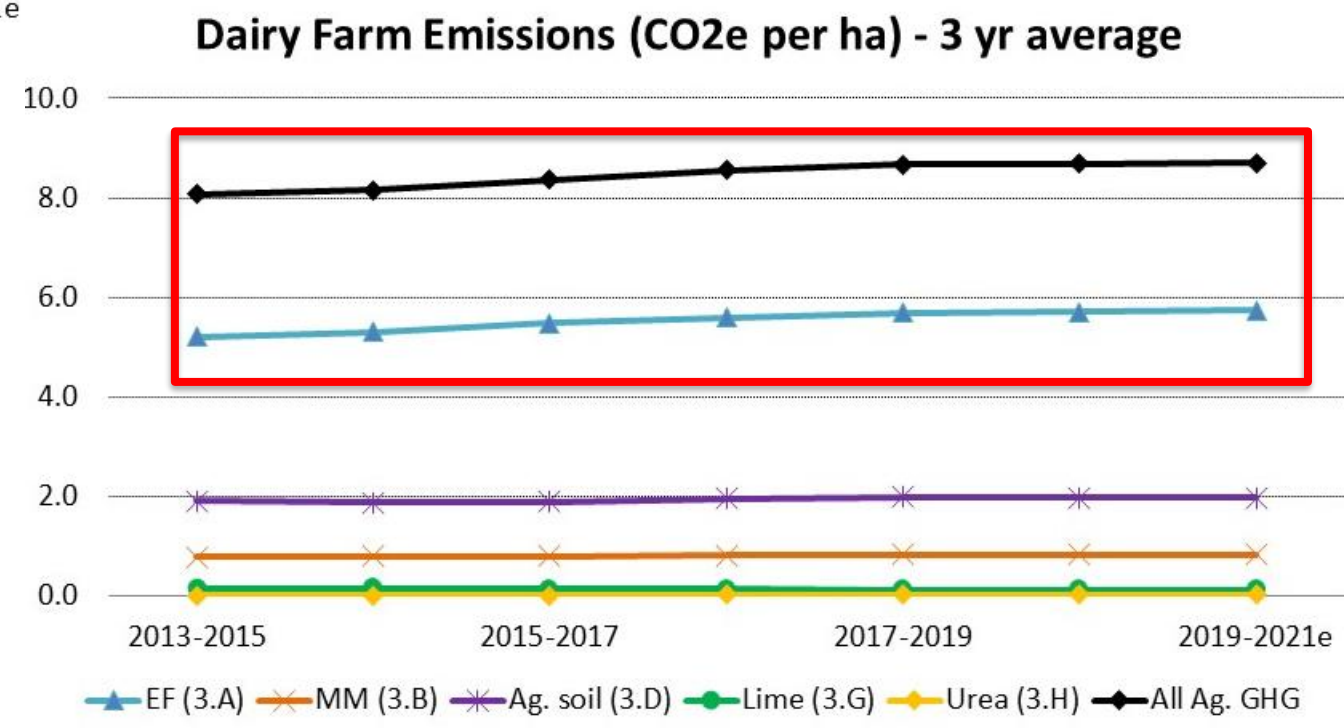
GHG emissions tonnes per hectare by Farm System



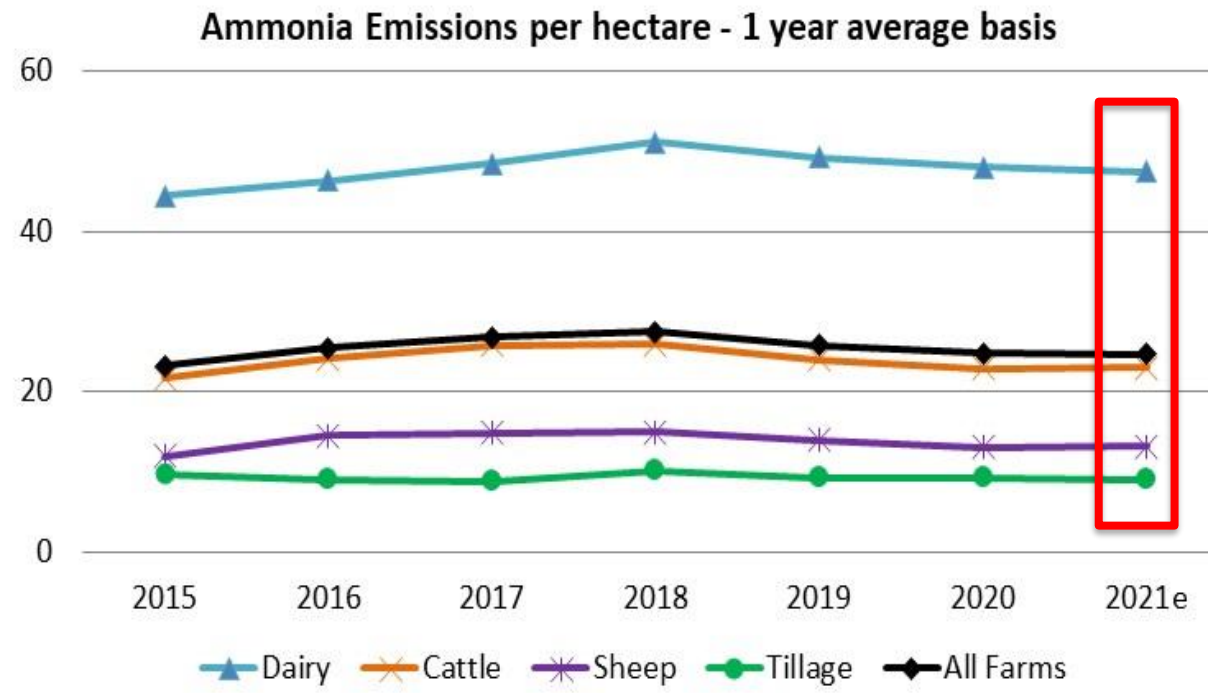


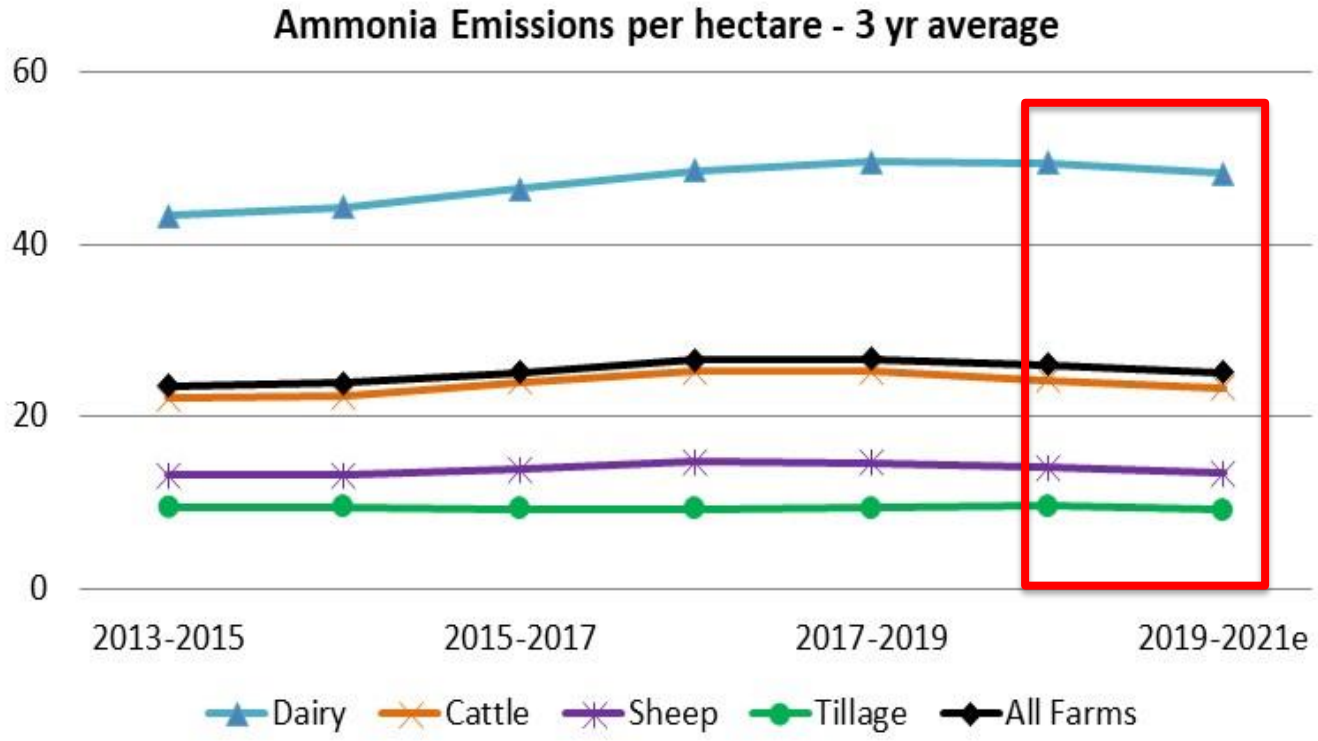
GHG emissions tonnes per hectare Dairy Farms – IPCC Category



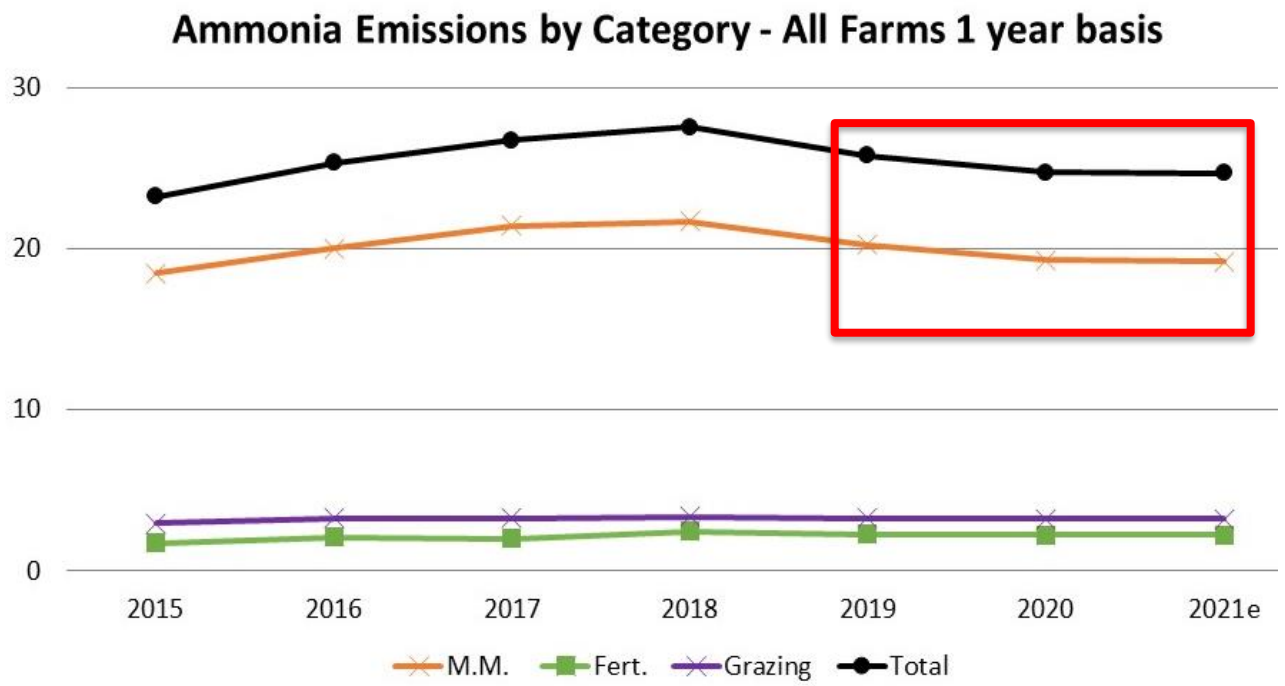


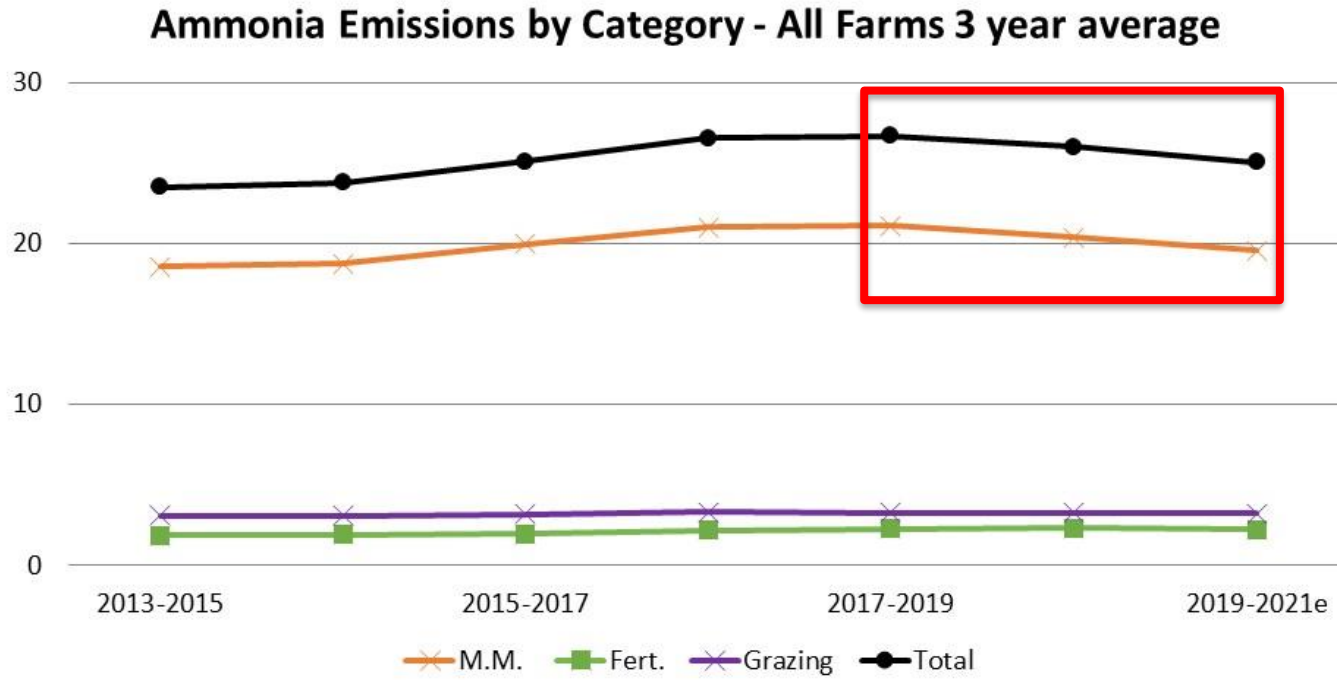
NH3 emissions kg per hectare – Farm System





NH3 emissions kg per hectare All Farms – Inventory Category





Summary / Conclusion

- **Higher activity levels - increased animal numbers and fertilisers applied in 2021**
  - June cattle number +0.61%
    - » Dairy Cows +2.35%
  - Sheep numbers +1.4%
    - » Ewes +4.3%
  - Chemical N sales (Sept-Oct) up by +5.2%

- **Absolute GHG Emissions in 2021 estimates:**
  - continued to increase on dairy farms (compared to preceding years)
  - other farm systems static or in decline (cattle, sheep, tillage)

- **Absolute NH3 Emissions in 2021 estimates:**
  - Projected to decline across all farms systems on foot of LESS uptake

- **Technology adoption:**
  - Sales of protected urea fertiliser are stagnant
  - Low emission slurry spreading use projected to increase significantly

Thank You

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