Balancing Emissions and Sustainability in Irish Agriculture

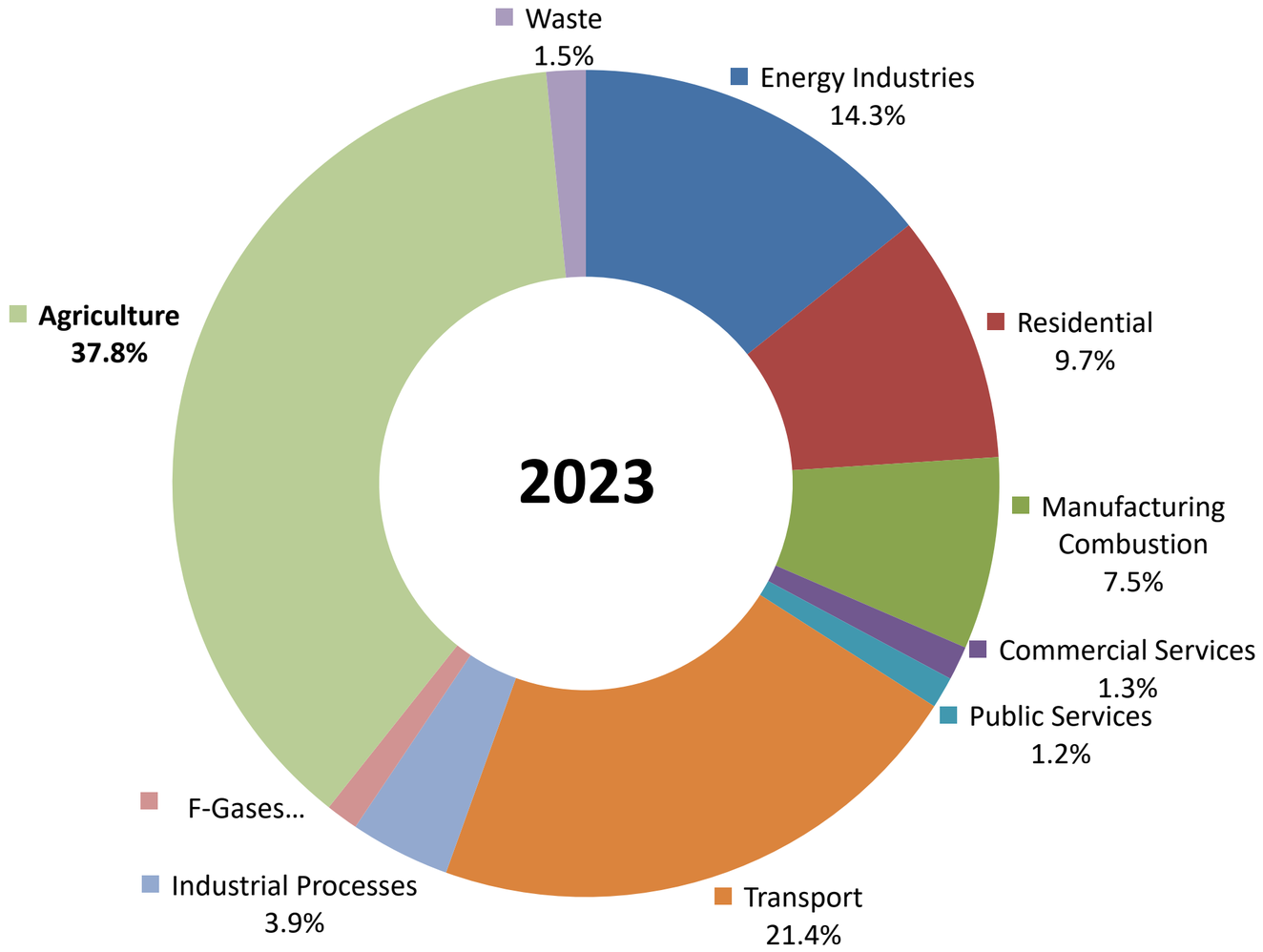
Karl Richards
Teagasc

Agriculture and Food Development Authority

Background

- Irish agriculture exports 90% of food produced c. €19 bln/yr
- Foot print of Irish food lower than international comparators
- Greenhouse gas emissions from Irish food production allocated to Ireland
- National targets set for greenhouse gas and ammonia emission reductions
- Internationally food production needs to reduce footprint

Irish Greenhouse Gas Emissions



- Chart shows Irelands provisional Greenhouse Gas emissions for 2023
- Food production from agriculture is the largest sector accounting for 37.8%

EPA 2024 Ireland's Provisional Greenhouse Gas Emissions 1990-2023

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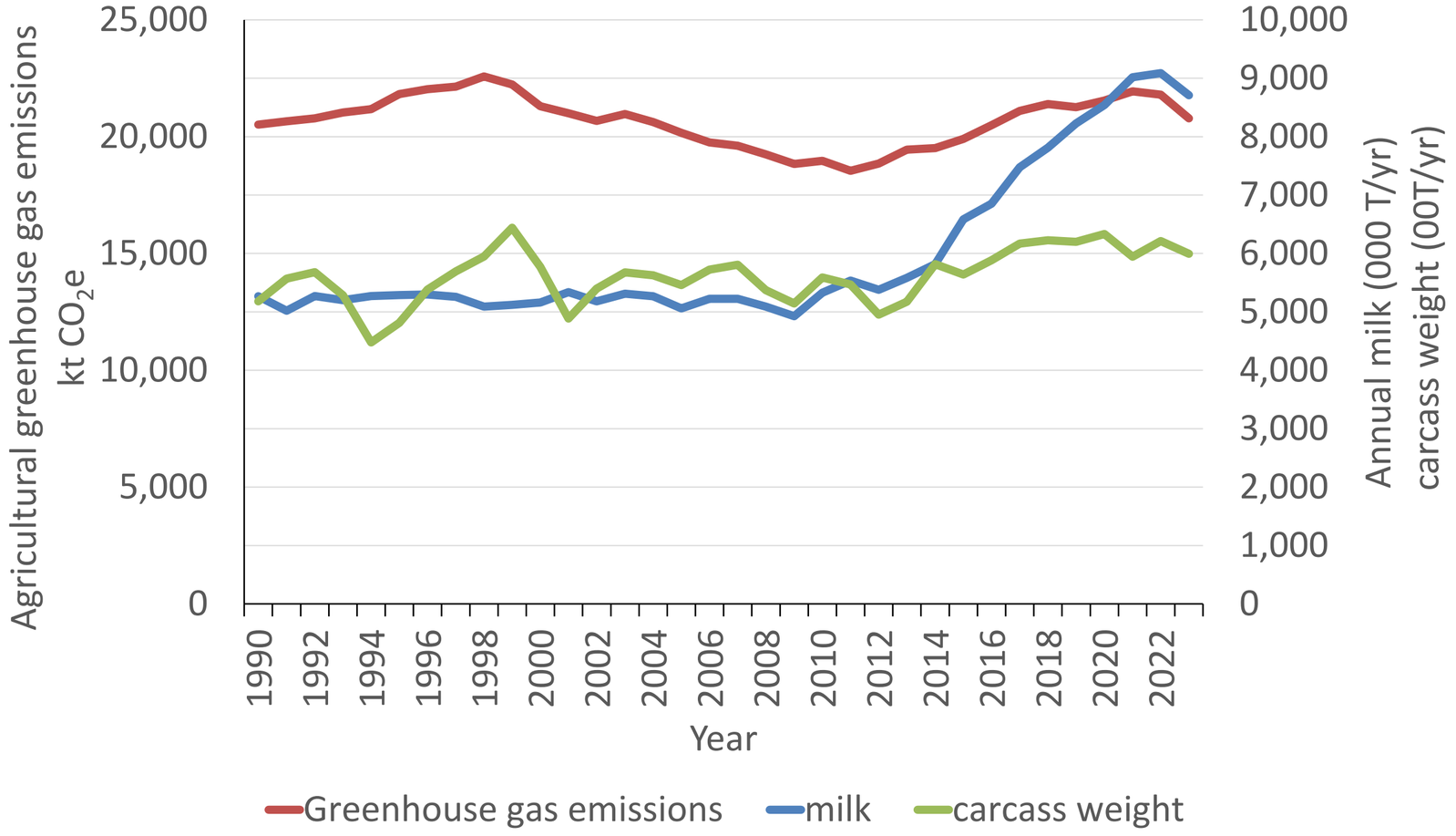
Agricultural Emissions and food production



- Chart shows agricultural Greenhouse Gas emissions 1990 to 2023
- Chart shows trends annual milk and meat production (carcass weight)
- 2014 to 2023 Dairy production increased 50% greenhouse gas emissions increased 6.5%

EPA 2024 Ireland's Provisional Greenhouse Gas Emissions 1990-2023; Eurostat apro_mk_cola, apro_mt_pann

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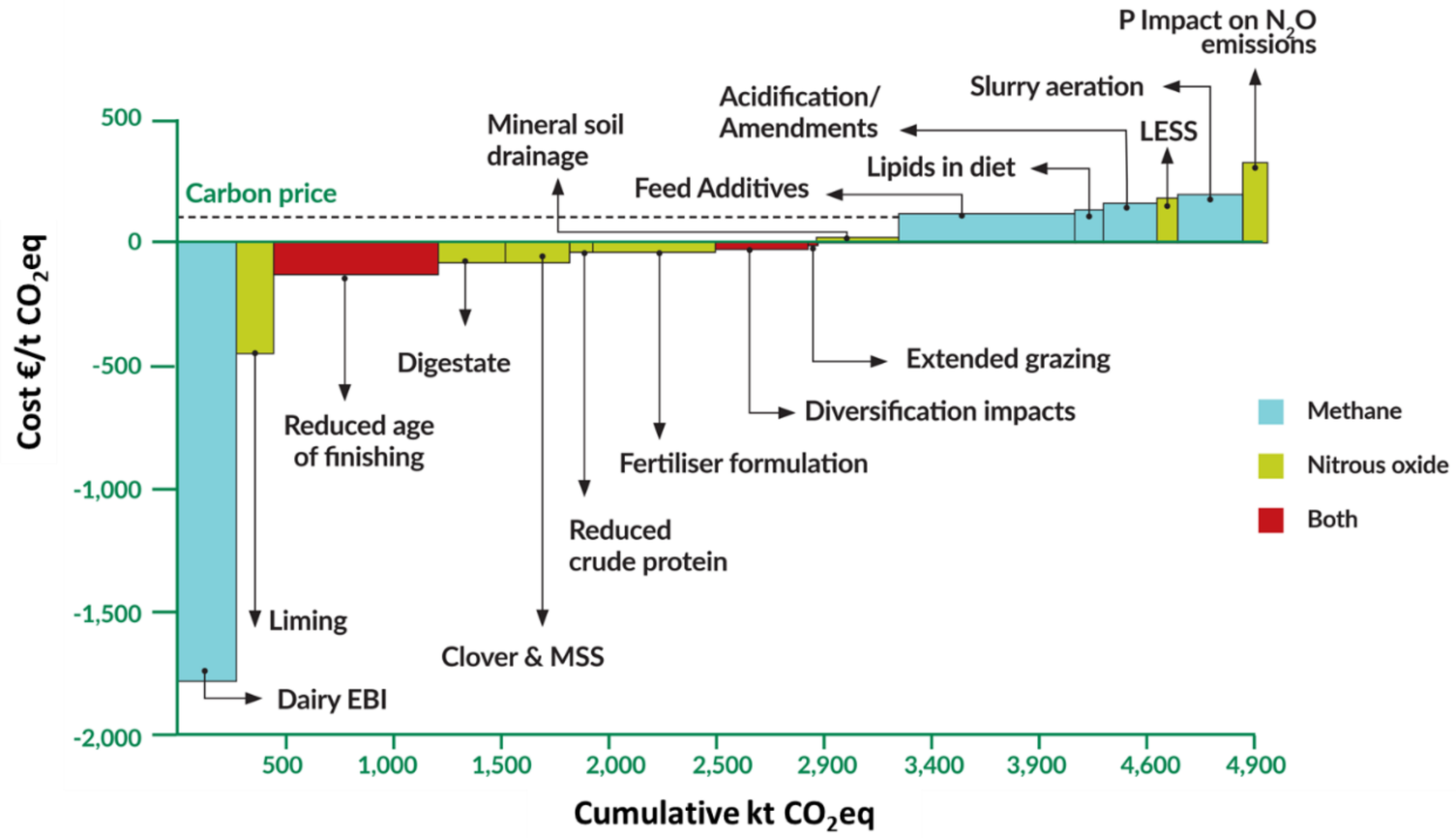
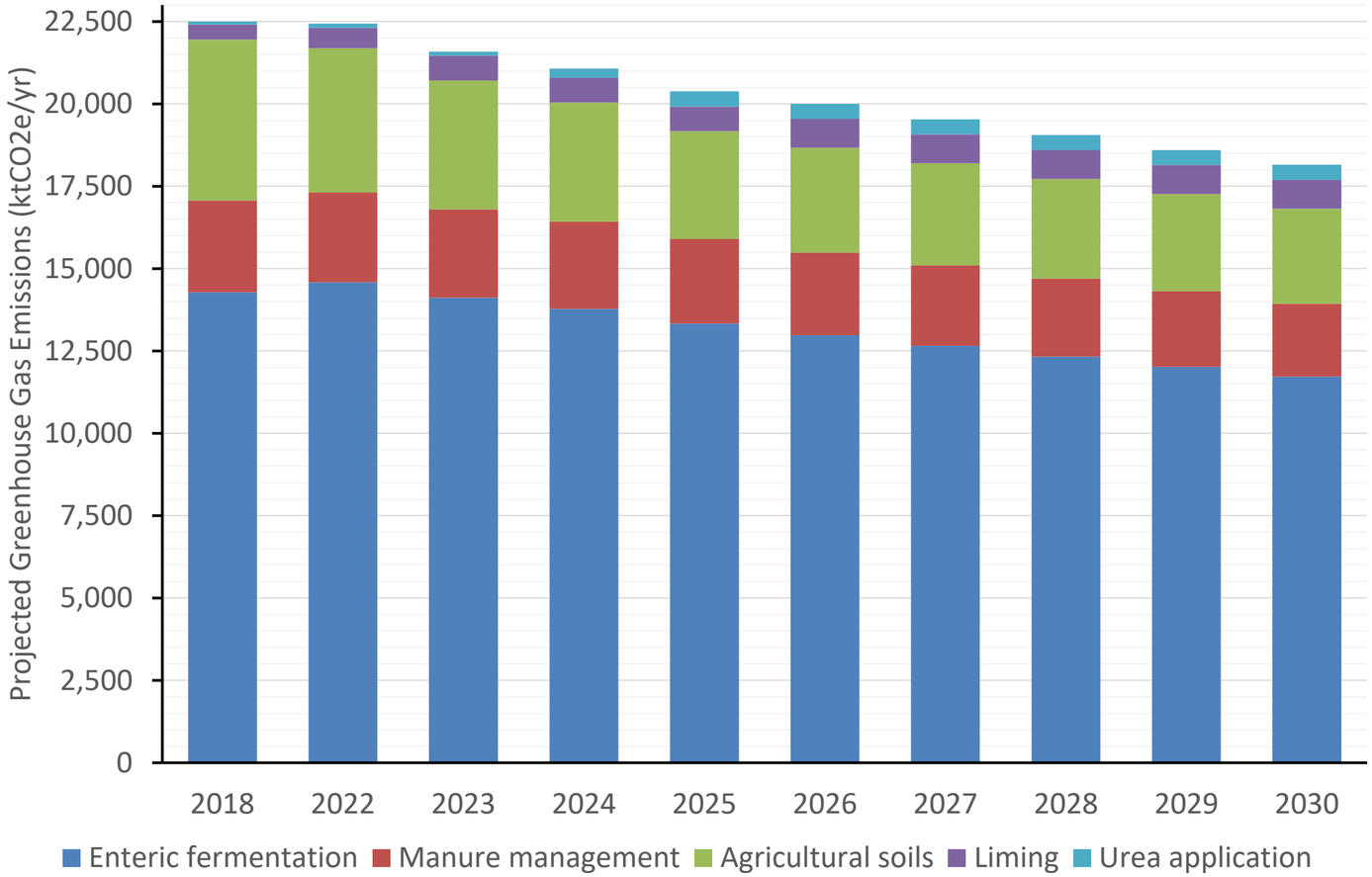
Mitigation of Agricultural Greenhouse Gas Emissions



Source: Lanigan et al. 2024 MACC 2023: An Updated Analysis of the Greenhouse Gas Abatement Potential of the Irish Agriculture and Land-Use Sectors between 2021 and 2030.

- Chart shows the 2023 Teagasc MACC , blue signifies methane reduction, green is nitrous oxide reduction and red reduction of both gases
- A Marginal Abatement Cost Curve (MACC) is a graph that visualises the abatement potential of GHG mitigation measures (horizontal axis), and the relative measure costs (vertical axis)

Agricultural Greenhouse gas emissions 2018 to 2030



- Chart shows agricultural Greenhouse Gas emissions 2018, 2022 & projected emissions 2023 to 2030 With Additional Measures
- Diversification measures 1,500 $ktCO_2e$ not included in EPA model projections
- Diversification from organic farming, forestry & biomass for biogas displaces animals

Source: EPA (2024). Ireland's Greenhouse Gas Emissions Projections 2023-2050.

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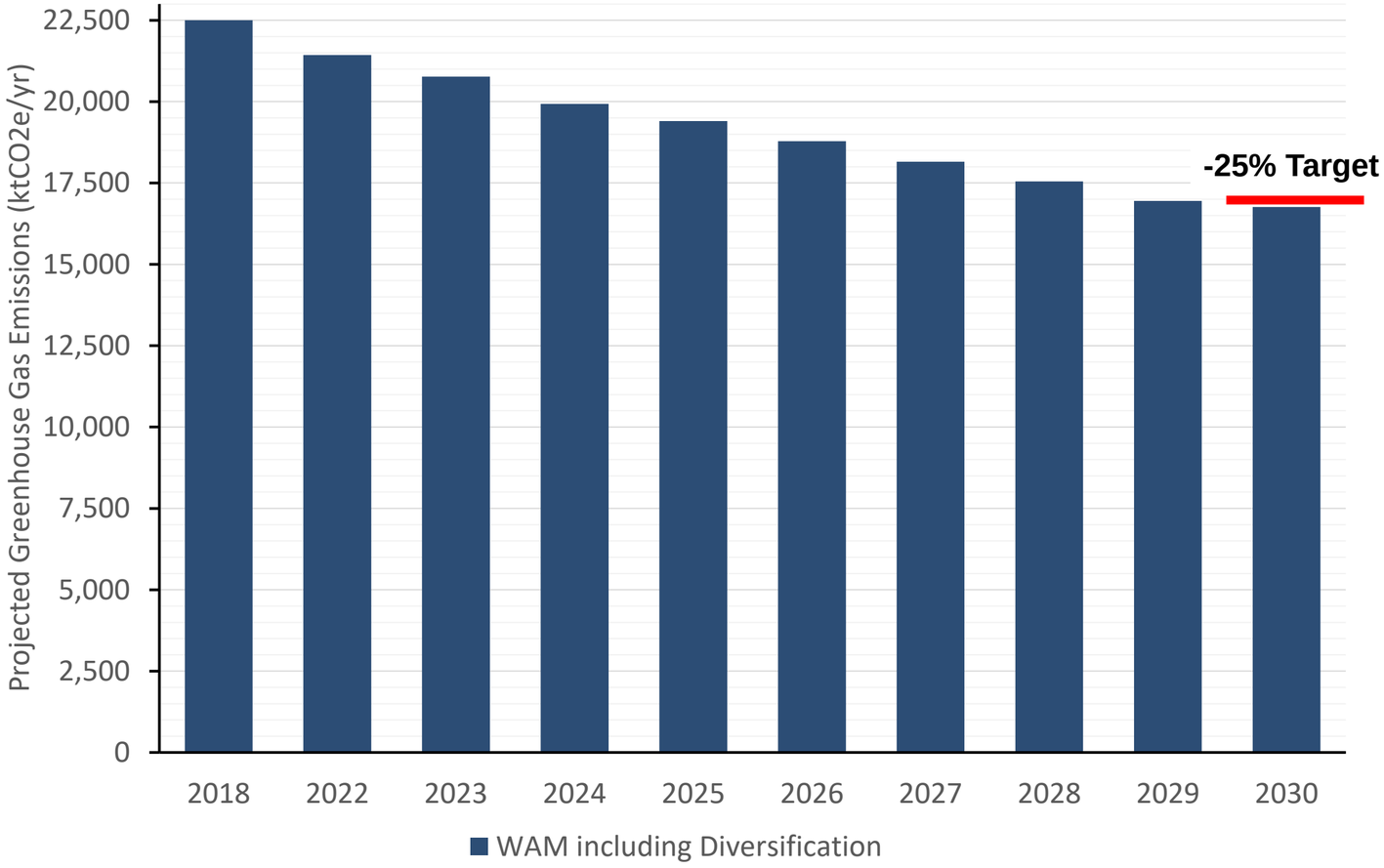
Agricultural Greenhouse gas emissions



- Chart shows agricultural Greenhouse Gas emissions 2018, 2022 and projected emissions 2023 to 2030 with additional measures including diversification
- Full implementation of the MACC can achieve the -25% agricultural target

Source: EPA (2024). Ireland's Greenhouse Gas Emissions Projections 2023-2050.

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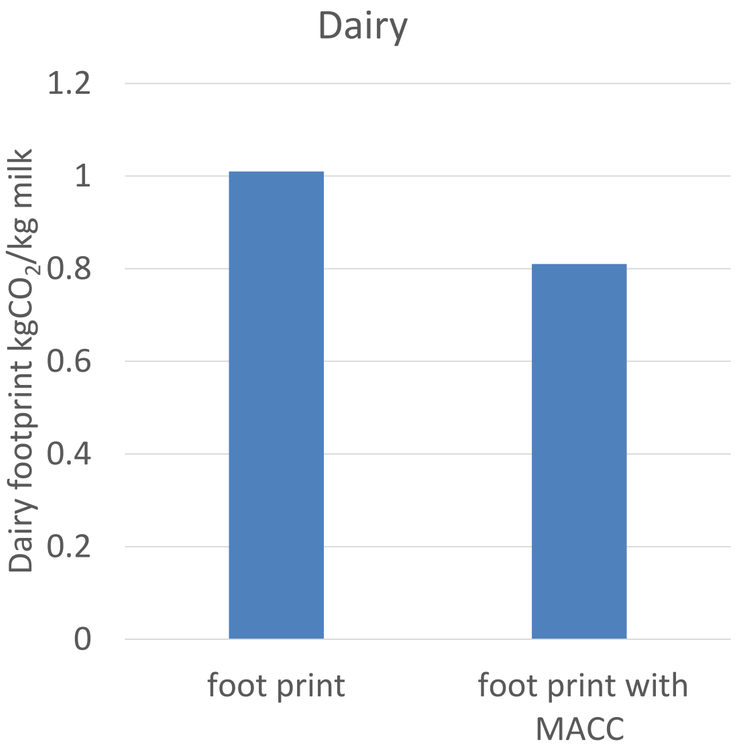
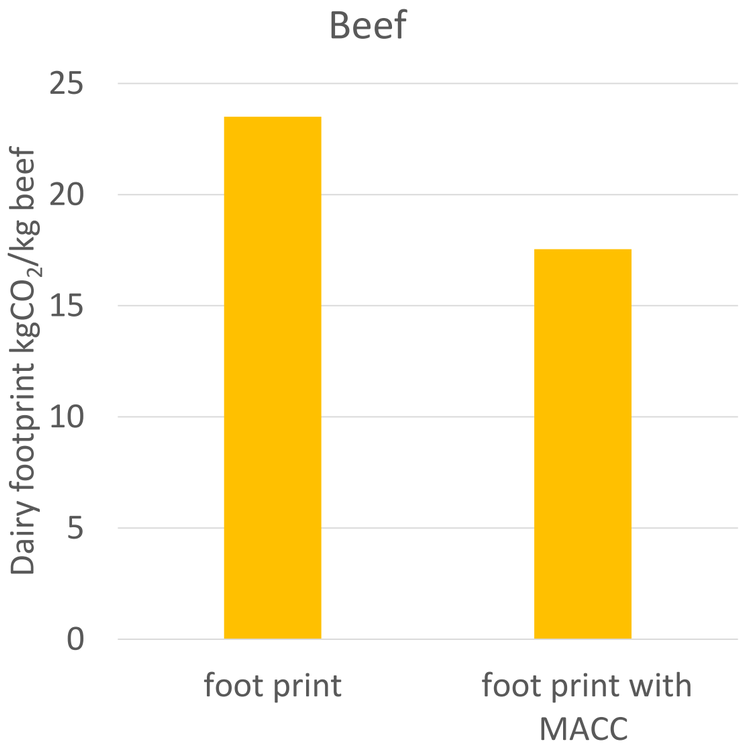
Agricultural mitigation – impact on carbon footprint

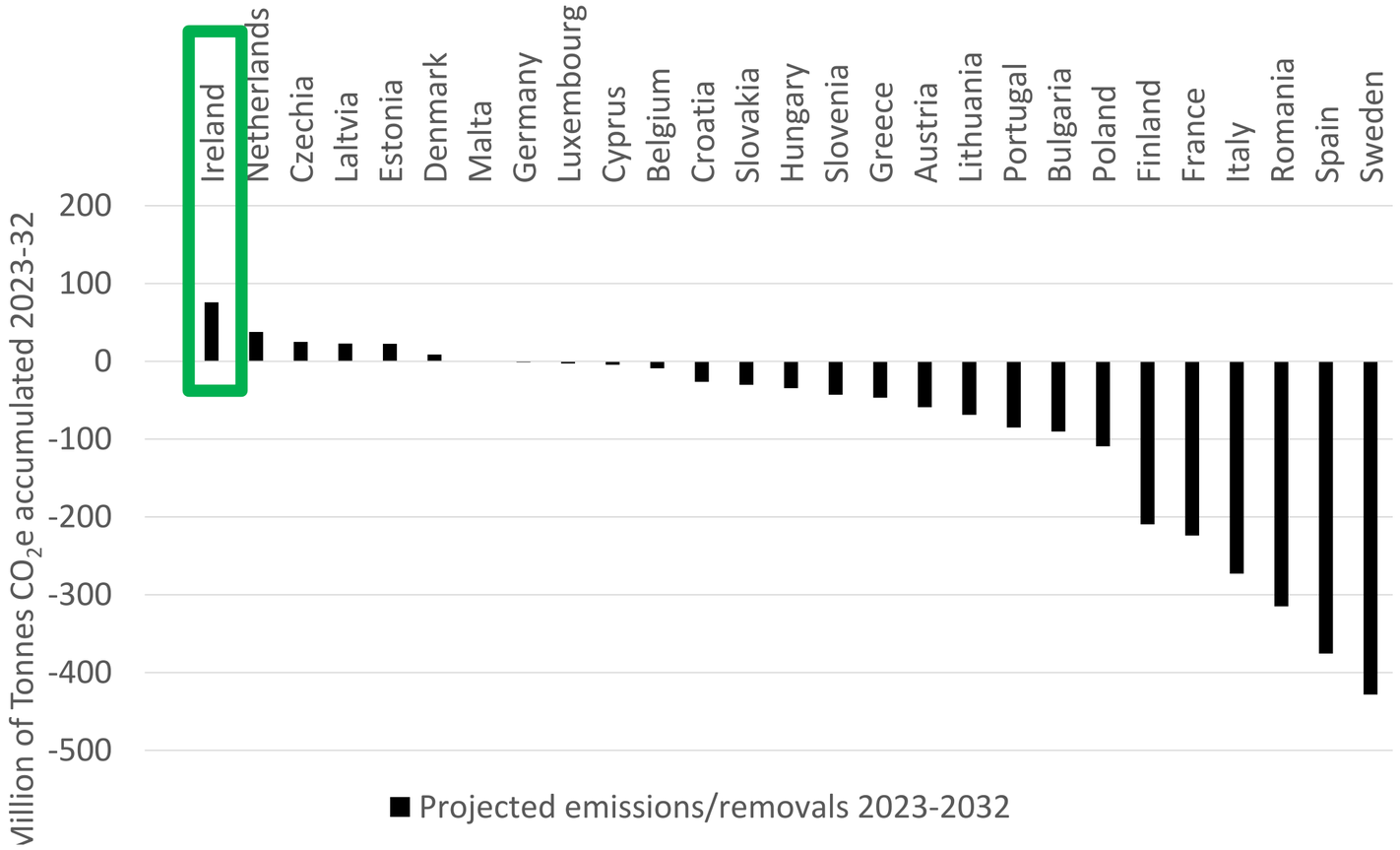




Source: Teagasc

- Chart shows the effect of MACC measure adoption on the carbon footprint of milk and beef (-20 to -25%)
- Carbon footprint of food expressed as kg CO_2 per kg of food product
- Carbon footprint does not include the density of nutrients/micro-nutrients

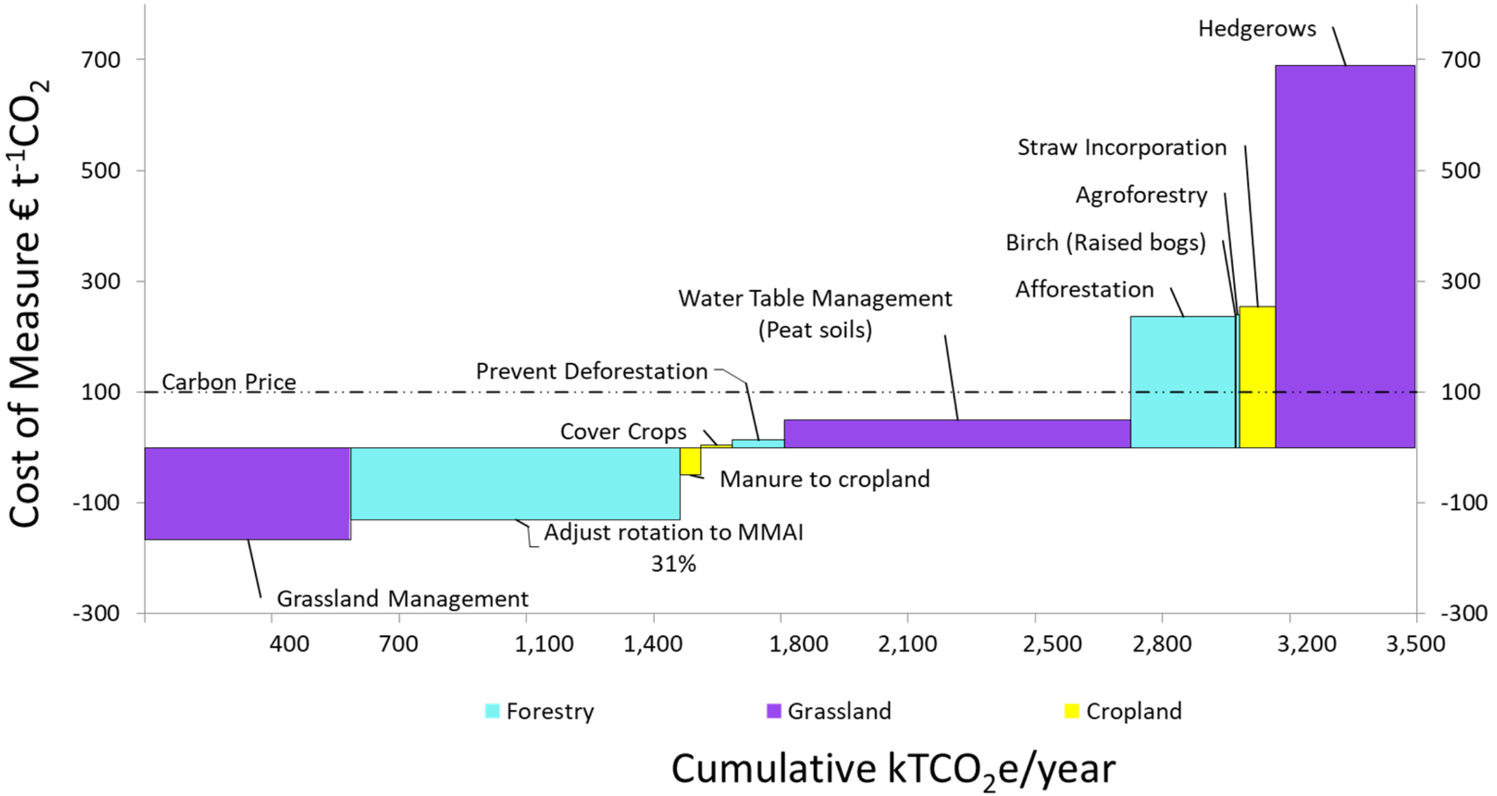
Land-use, Land-use change and forestry emissions/removals



- Chart shows the projected emissions & removals for the EU from 2023-2032
- Ireland is projected to have the largest emissions with only 5 other countries being a net source of emissions
- Irish emissions driven by forest harvesting, drained wetlands and drained grassland on peat

Source: National emissions reported to the UNFCCC and to the EU under the Governance Regulation, April 2024, European Environment Agency (EEA)

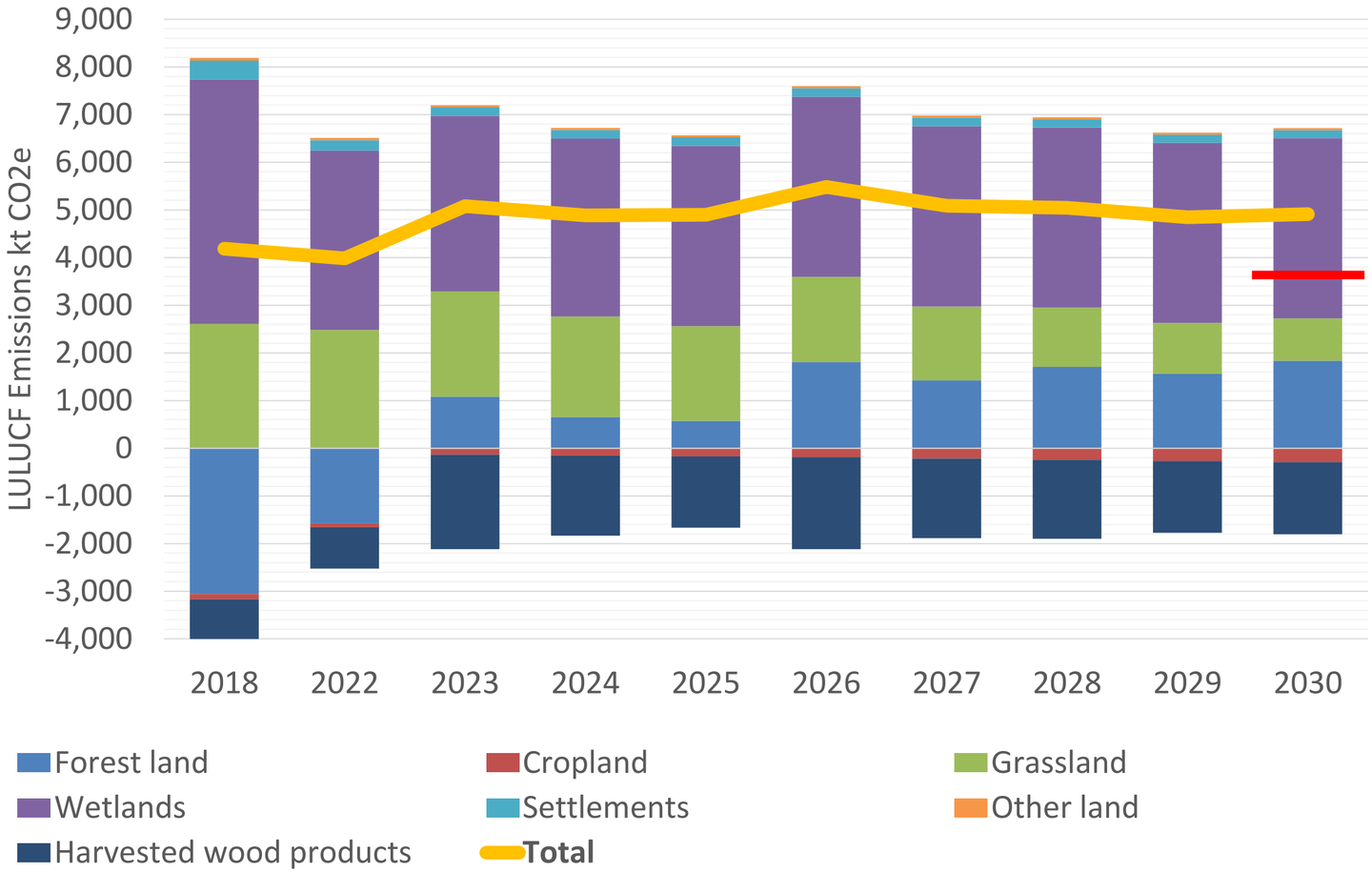
Mitigation of Land-use, Land-use change and forestry emissions



- Chart shows the 2023 Teagasc MACC , measures are colour coded: purple = grassland, blue = forestry & yellow = cropland
- A Marginal Abatement Cost Curve (MACC): a graph that visualises the abatement potential of GHG mitigation measures (horizontal axis), & the relative measure costs (vertical axis)

Source: Lanigan et al. 2024 MACC 2023: An Updated Analysis of the Greenhouse Gas Abatement Potential of the Irish Agriculture and Land-Use Sectors between 2021 and 2030.

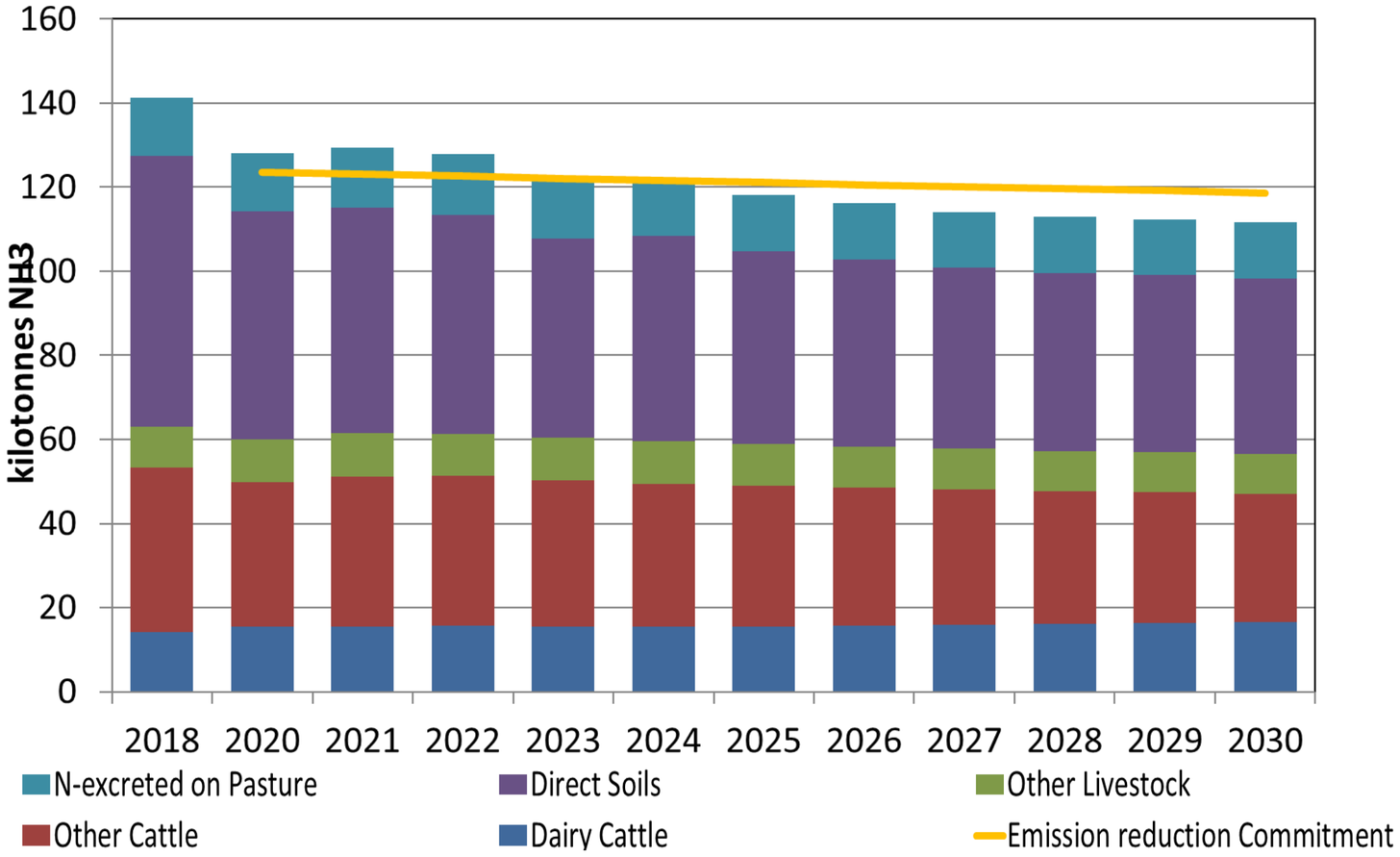
Land-use, Land-use Change and Forestry Greenhouse gas emissions



Source: EPA (2024). [Ireland's Greenhouse Gas Emissions Projections 2023-2050](#).

- Chart shows Land-use Greenhouse Gas emissions 2018, 2022 and projected emissions 2023 to 2030 with additional measures
- Emissions below zero are carbon sinks which is declining and above zero are carbon emissions
- Orange line are the net emissions and red line indicates the 2030 reduction target

Projected Agricultural Ammonia emissions



- Chart shows Agricultural ammonia emissions
- Emissions sorted by emission source
- Yellow line indicates emission reduction target
- Emission reduction can be met with switch to protected urea and low emission slurry spreading

EPA (2024) Ireland's Air Pollutant Emissions 1990-2030

MACC 2030: Progress to Date

Reduce Nitrogen fertiliser use by 30% (300,000 T N)

2023 sales of N fertiliser 280,569 TN. Similar sales to Q3 2024

Projected urea constitutes 95% of straight fertiliser Nitrogen

CAN sales reduced from 73% (2018) to 49% (2023)
Protected Urea sales increased 1.6% (2018) 22% (2023)

Diversification

Biomethane strategy launched; Organics area increase to 5% target 10% 2030;
Forestry planting below 8k ha target

Feed additives fed start 2026

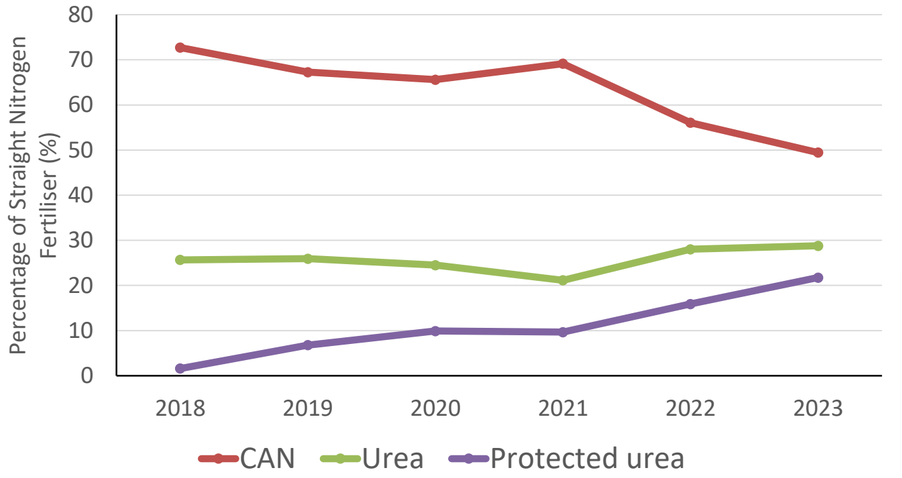
Active research area – range of additives, grazing optimisation.
On farm demonstration on 20 Signpost dairy farms 2023-24. Cost?

Average age of finish of beef cattle

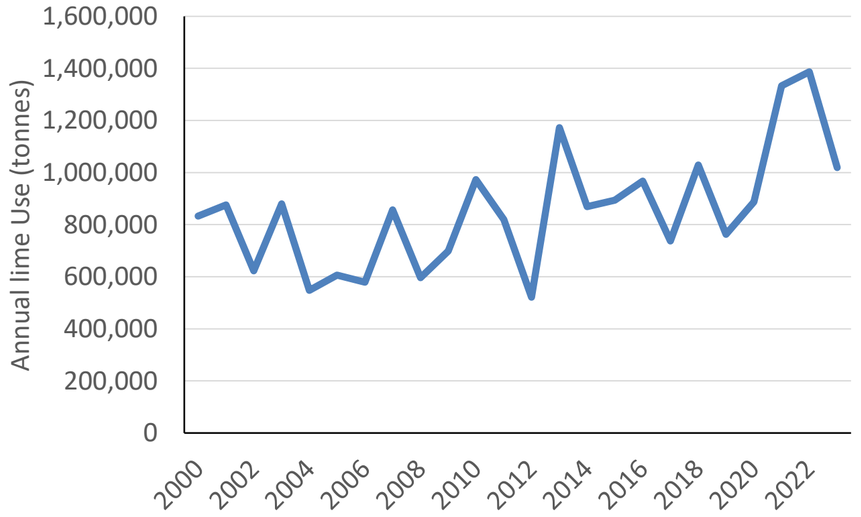
Reduced by c. 2 months over last decade.
No progress in 2023- costs & poor weather

Increase liming to 2.5 M Tonnes

Lime use reduced from 1.7MT in 2018 to 1MT in 2023 poor weather



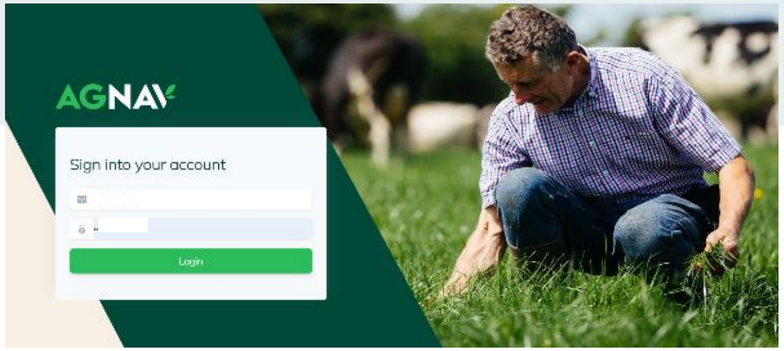
Source: Fertiliser Division DAFM



Source: Central Statistics Office

Climate Action - Signpost

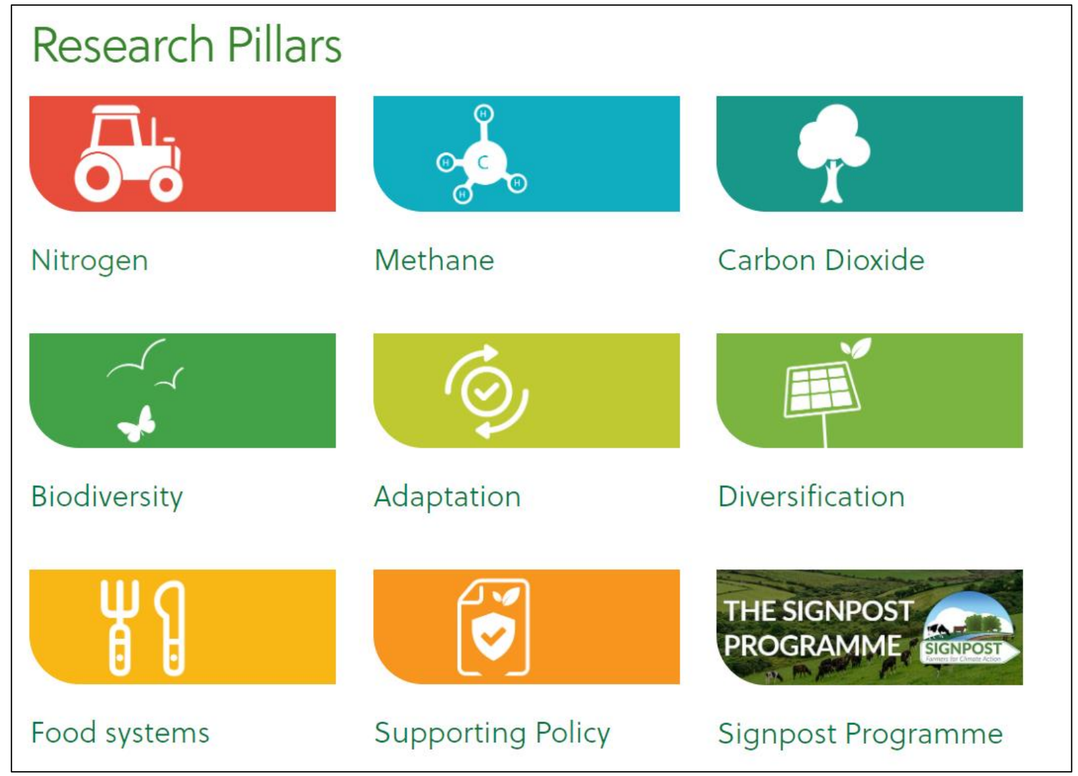
- Joint Industry-Government initiative – the Signpost Programme
- 120 farms demonstrating implementation of measures
- Signpost Advisory programme – July 2023 21 dedicated advisors
- Develop farm plan to reduce emissions and support implementation
- Use the AgNav digital tool to baseline emissions & generate action plan
- John & Brendan Walsh (Winners Teagasc FBD Environmental Sustainability Awards 2024



Climate Centre

TEAGASC CLIMATE CENTRE

- Co-ordinate agricultural climate and biodiversity research & innovation across Teagasc
- Accelerate technological development & implementation to reduce greenhouse gas emissions and enhance biodiversity
- Support & facilitate the Irish agriculture sector to meet its commitments in reducing greenhouse gas emissions & restoring biodiversity



Summary

- Agricultural emission reduction targets for 2030 can be achieved
- Achieving the Land-use, Land-use change & forestry target very challenging
- Knowledge transfer important but incentives and policies needed to achieve the very high adoption targets
- Full implementation of the technical measures in the MACC needed
- Further research needed to support climate neutral food production

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THANK YOU

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