Science and Agricultural Sustainability from the Irish and European perspective

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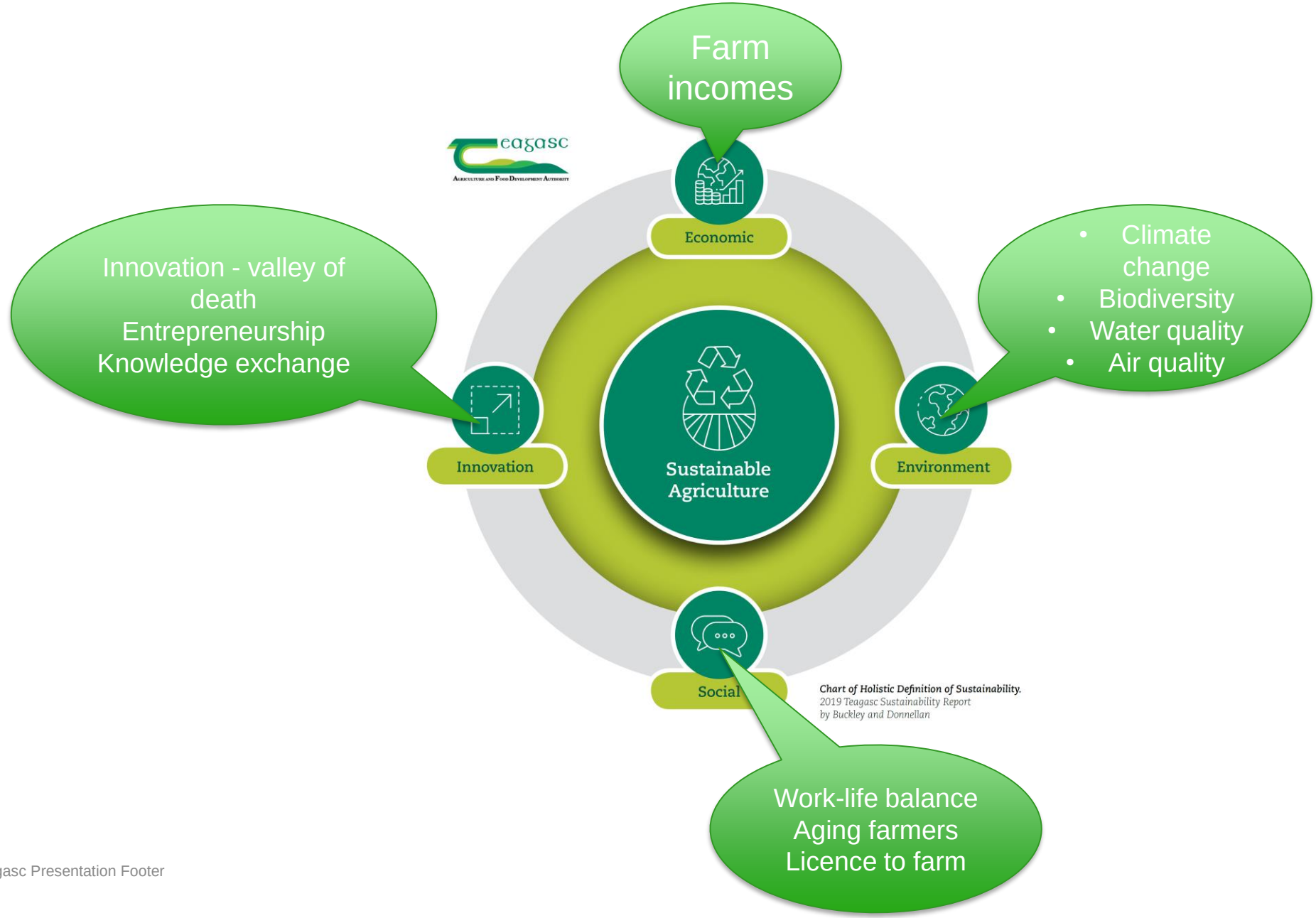
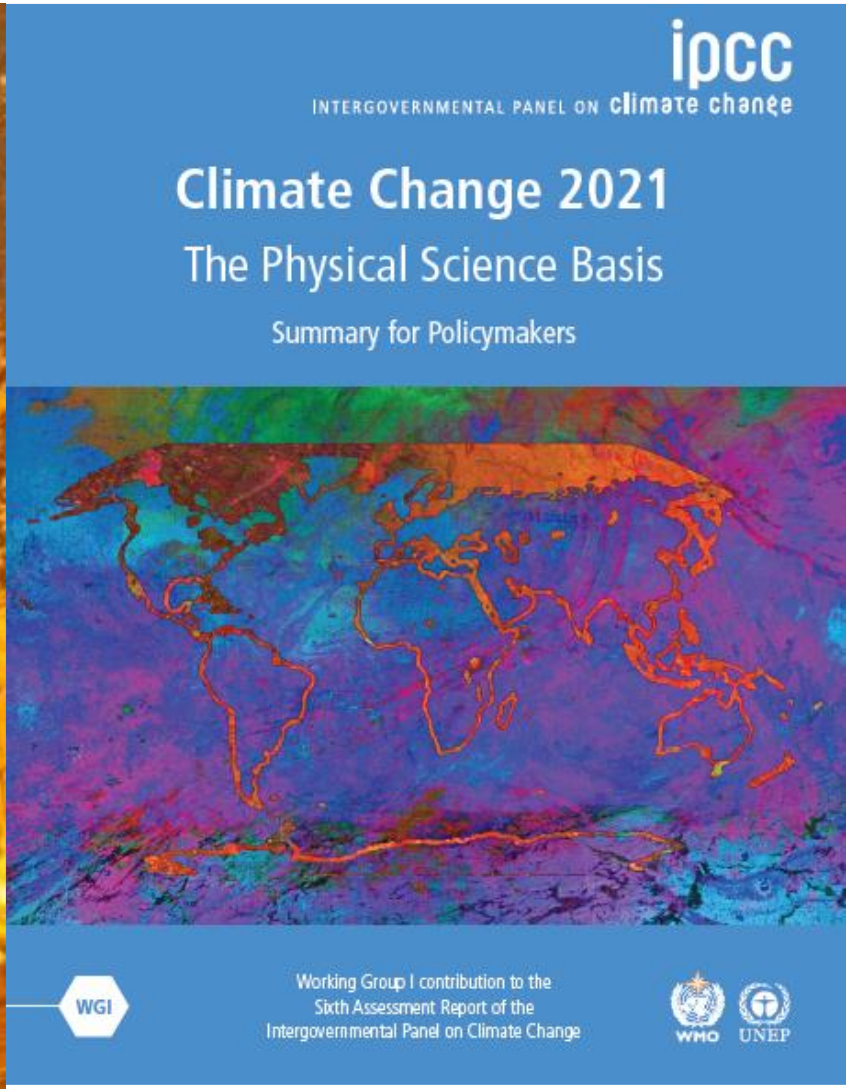
Many dimensions to sustainability – all are important

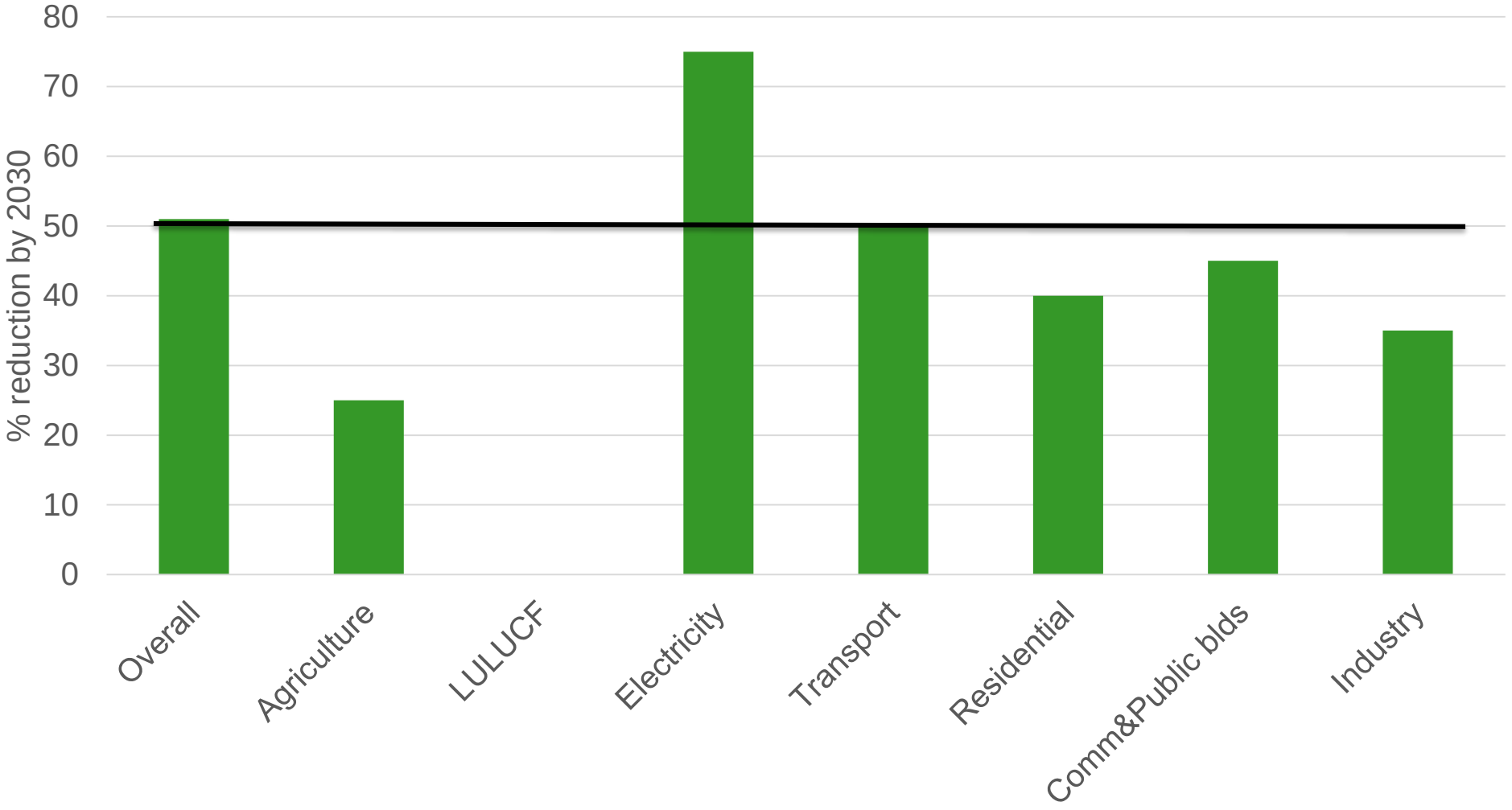


Climate change – the challenge of our time



Sectoral targets (Climate Action Plan)

% reduction required by 2030, compared to 2018 as a baseline



Agriculture emissions

2018: 23 MT CO_2e

2030: 17.25 MT CO_2e

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Country	Agriculture emissions reduction target
Ireland	25% reduction by 2030 compared to 2018 (LULUCF in 18 months)
N. Ireland	• Territory: 48% below baseline by 2030, net zero by 2050 • Methane to be reduced by at least 46% compared to baseline by 2050
UK	• Net zero by 2050 • UKCCC says agri emissions need to fall by 30% by 2035 • NFU goal of net zero by 2040 through reduced emissions, carbon sequestration and renewable energy/bioeconomy
New Zealand	Reduce methane by 10% by 2030 compared to 2017, and by 24 - 47% by 2050
Netherlands	• 42% reduction in Agri GHG by 2030 compared to 1990. • As emissions have fallen by 18% between 1990 and 2019, this means a 24% reduction from 2019 to 2030. Ammonia a bigger problem now.
Canada	• Agriculture target to be climate neutral/net zero by 2050. • Beef target minus 33% by 2032; Dairy target net zero by 2050 • Proposal to reduce fertiliser by 30% by 2030 • Target to reduce methane by 40-45% by 2025, but focus on oil and gas (only 29% of methane emissions come from agriculture)
France	Under discussion. 30% by 2030 compared to 2015 ????

Sources: E Magowan, NI; M Lee, UK; J Roche, NZ; M Scholten, NL; T McAllister, Canada; JL Peyraud, France

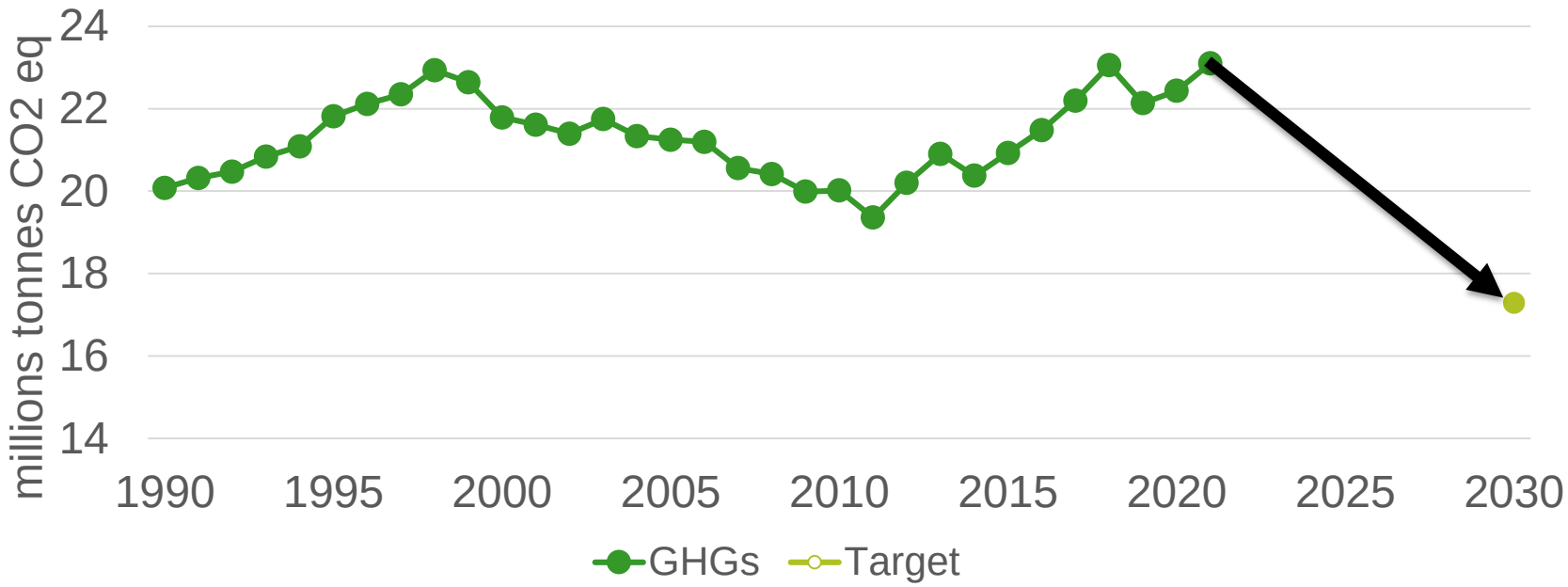
Important to have targets but

- Mitigation potential of agriculture highlighted for years in IPCC reports
- Mainly related to restoring degraded soils
- This potential has not yet been realised
- Global agriculture emissions

  grew by 5.2±1.4Gt CO_2e/yr from 1990 -1999

  grew by 6.0±1.6Gt CO_2e/yr from 2000 – 2019

Our target will require a massive change of direction



Points to note

- Already carbon efficient
- Consumers / customers want low carbon foods
- Technologies and efficiency can allow a lot of progress
- Irish agriculture must remain profitable and competitive

Climate neutrality by 2050

- Long way off, but still hugely important
- EU Fit for 55 proposals: climate neutral EU land sector by 2035 (Agri + LULUCF = AFOLU)

(Increased carbon removals to balance reduced agricultural emissions, including from livestock and fertiliser use)

- EU wide target, not for individual countries
- Irish AFOLU is a huge distance from this definition of climate neutrality
- Need clarity on methane and land emissions/removals

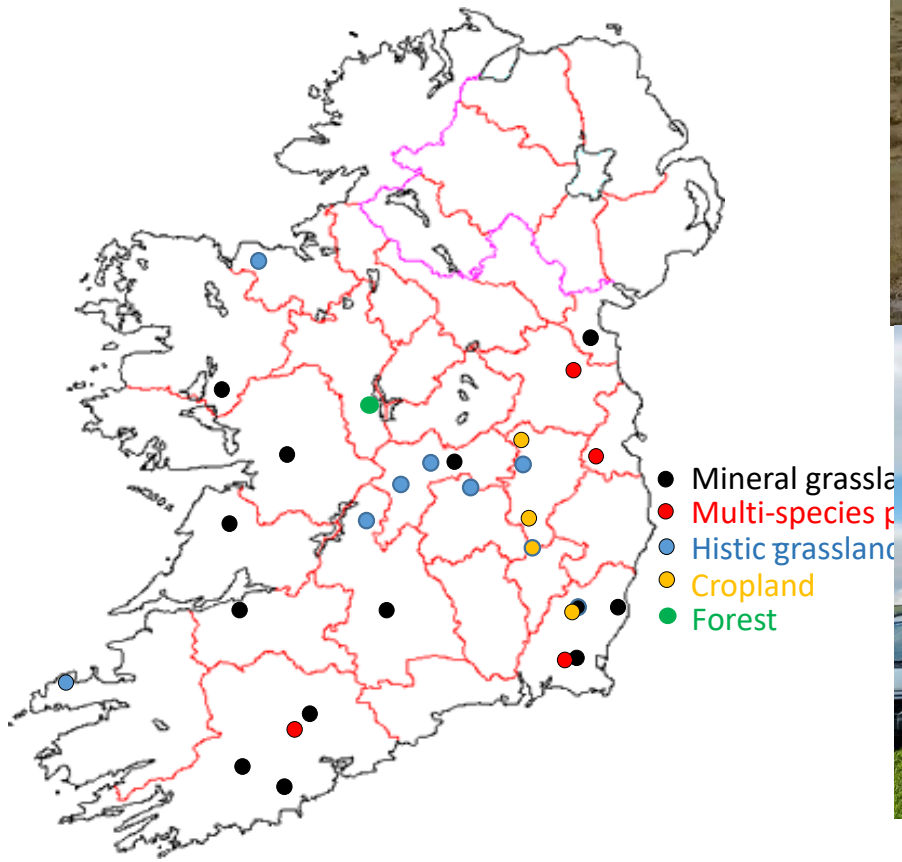
Methane, Irish agriculture's biggest GHG

- Need CO_2 at net zero but not methane ("*strong and sustained reduction*…")
- Some countries setting out separate target for methane
- Currently we don't distinguish it from CO_2, N_2O
- Issues around the metric to use – GWP100 / GWP*
- Ireland / EU needs to agree position

Reducing uncertainty in soil carbon

National Agricultural Soil Carbon Observatory (NASCO)

- Network of 30 flux towers to measure soil carbon sequestration / emissions
- Plus deep soil sampling at selected locations
- Provide Irish Tier 2 data for drained organic soils and mineral soils
- Help prepare for carbon farming



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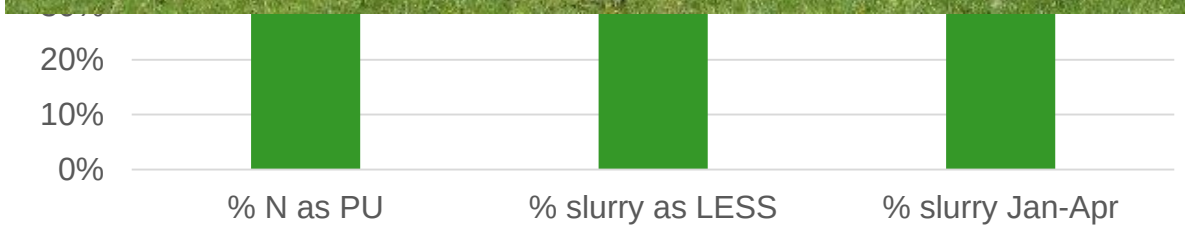
What farmers are doing



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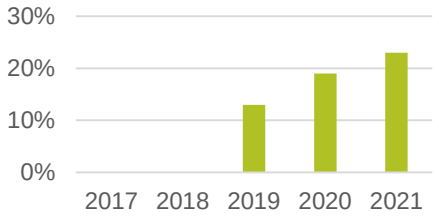
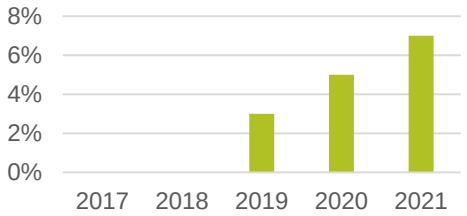
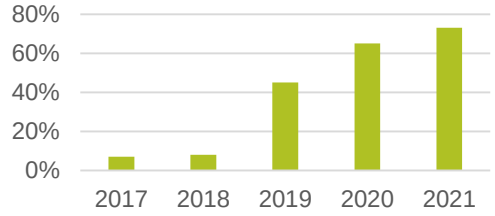
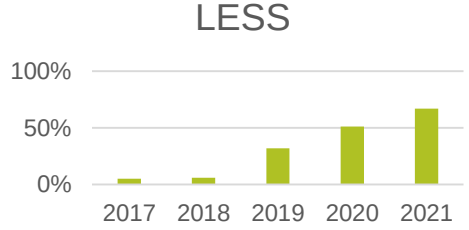
What farmers are doing – preliminary data from NFS sustainability Report

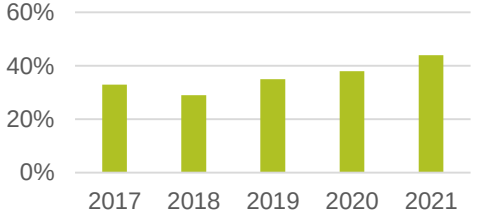
Specialist dairy farms









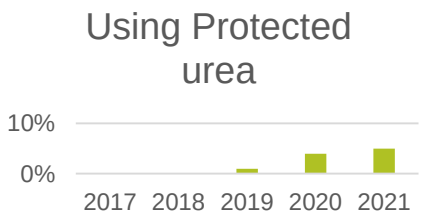


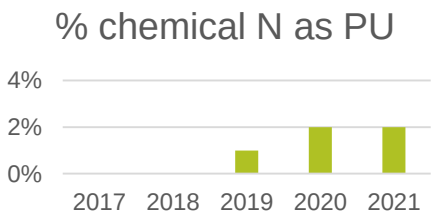
DAFM fertiliser sales figures for 1st October 2021 to 30th June 2022

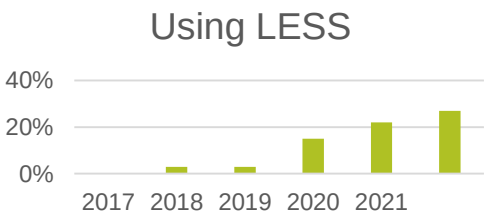
47% increase in the usage of Protected Urea

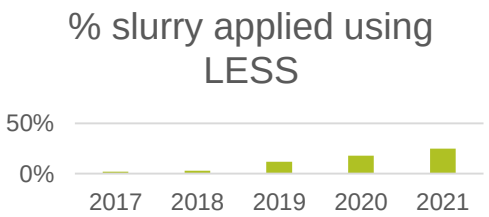
PU now makes up 16% of straight Nitrogen (N) sales

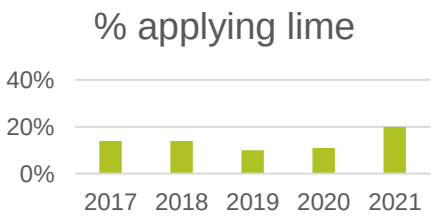
Cattle farms











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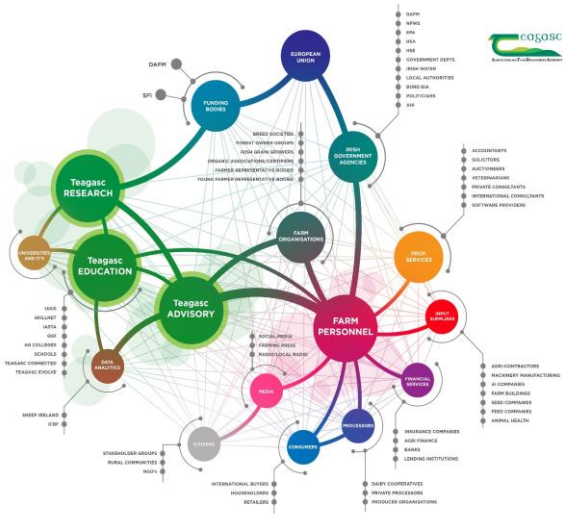
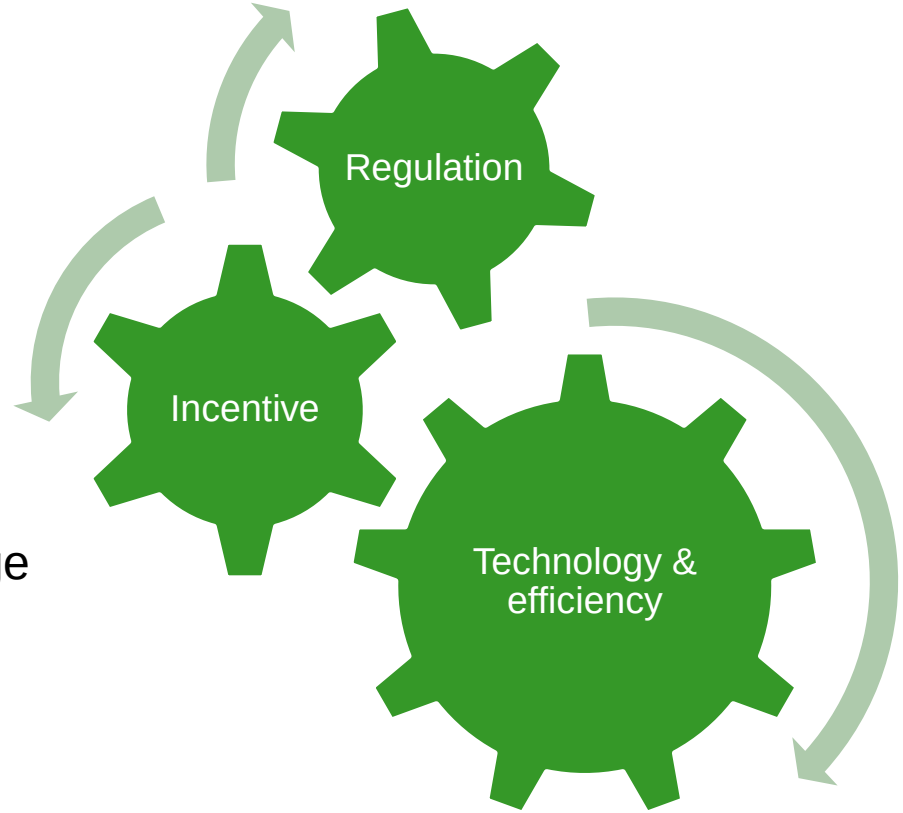
What farmers are doing – Clover incorporation
(Preliminary results from 2021 National Farm Survey)

- Specialist dairy
  - 17.8% reseeded to some extent with an enhanced clover mix (>1 kg clover /ac) in the last 3 years
  - 7.6% indicated oversowing with clover (significant overlap with above)
- Cattle farms
  - 6.2% reseeded to some extent with an enhanced clover mix (>1 kg clover /ac) in the last 3 years
  - 3.3% indicated oversowing with clover (significant overlap with above)

Achieving target will require whole of industry response



Irish AKIS (Agricultural Knowledge and Innovation System)



Teagasc role

Create a technology & efficiency roadmap to meet targets and support farmers to implement it

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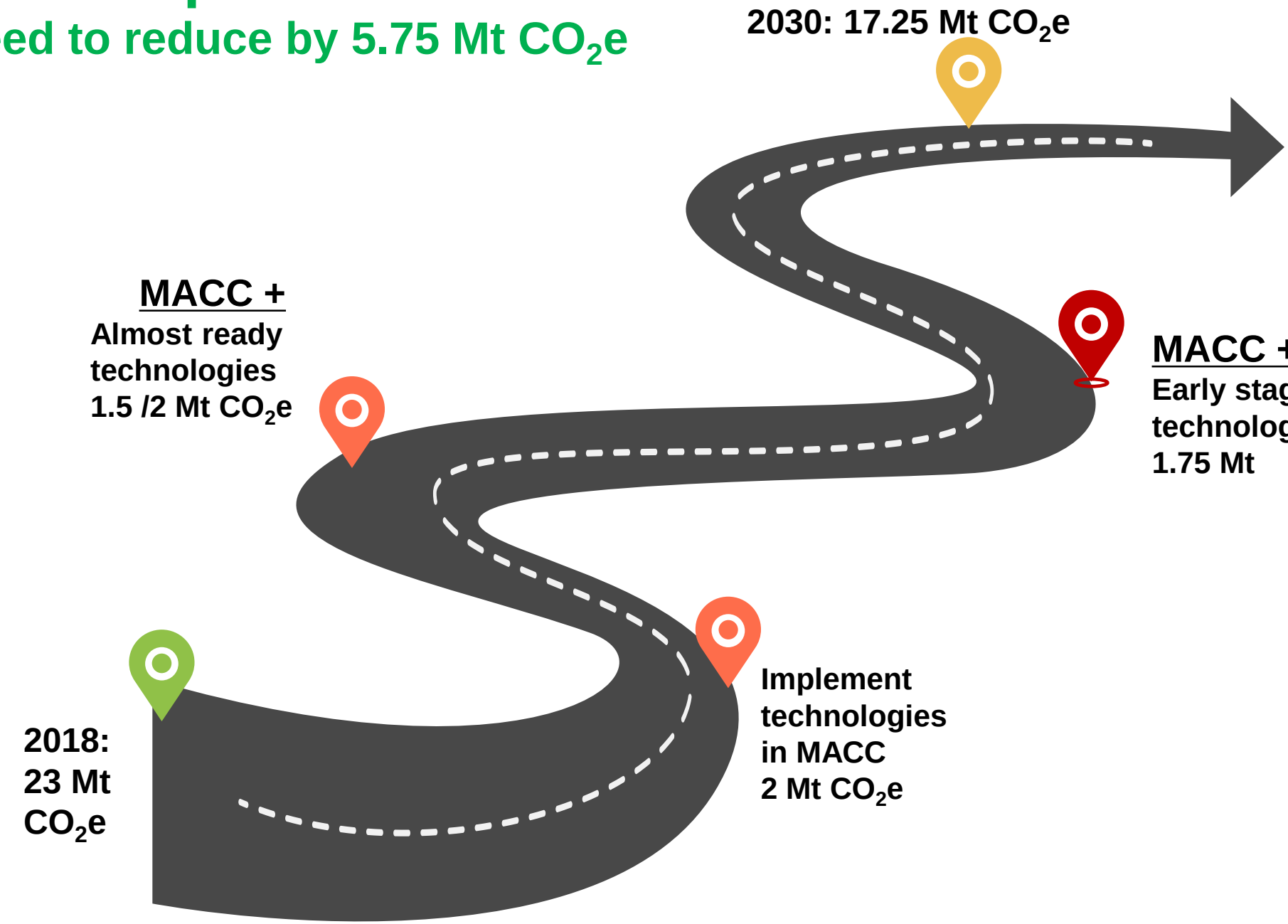
Roadmap to 2030 +

Need to reduce by 5.75 Mt CO_2e



Key initiatives in Teagasc Climate Strategy

New National Centre for Agri-Food Climate Research & Innovation

New Signpost Climate Advisory progamme with individual farmer support

New Sustainability Digital Platform

Sustainability digital platform

Carbon calculator and Decision Support Tool

Create farm carbon plan

ICBF.com

Measure whole farm data from multiple sources

Monitor progress & prepare for carbon farming

EU Carbon Farming proposals

By 2028, access to verified emission and removal data for all land managers

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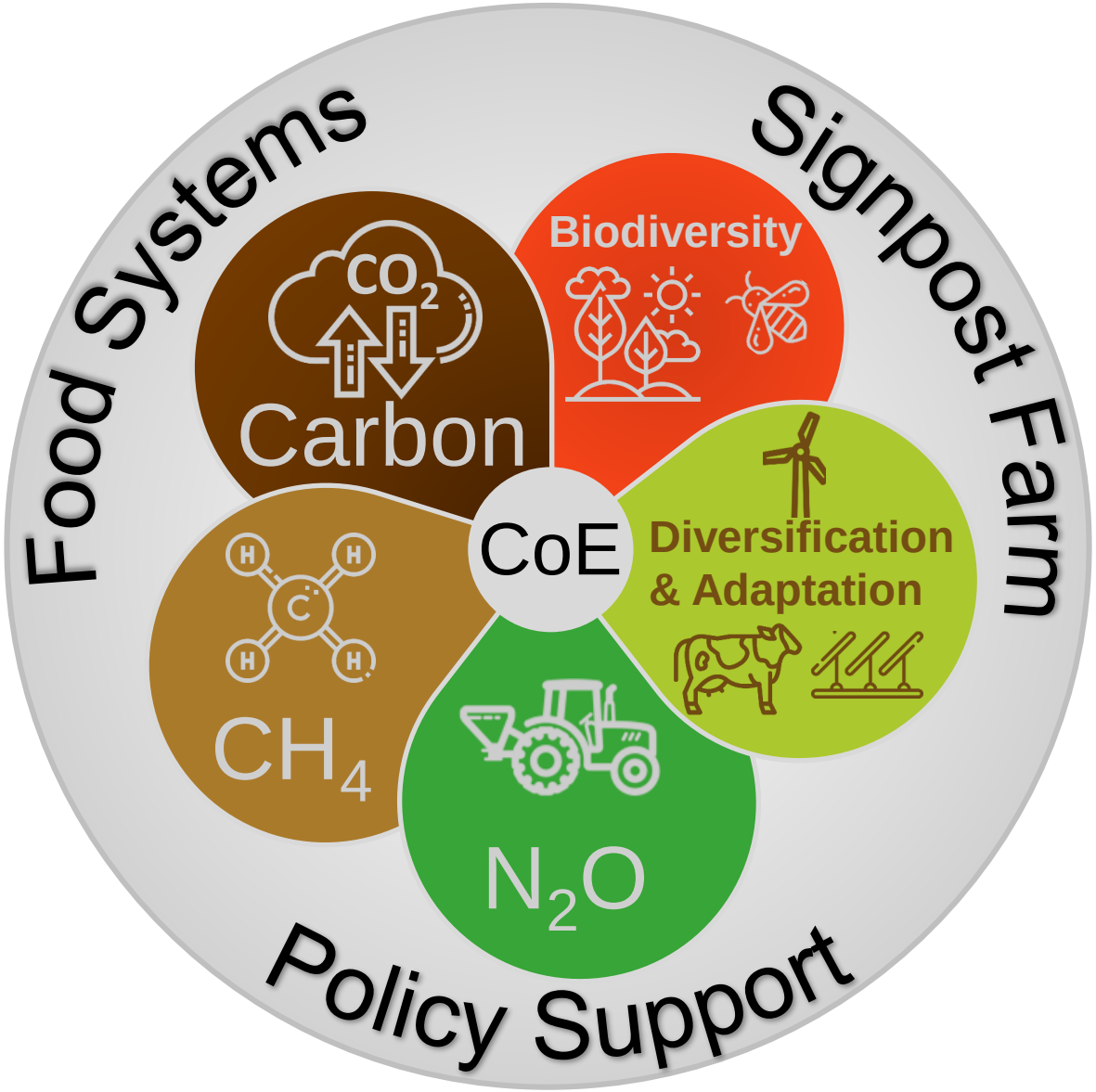
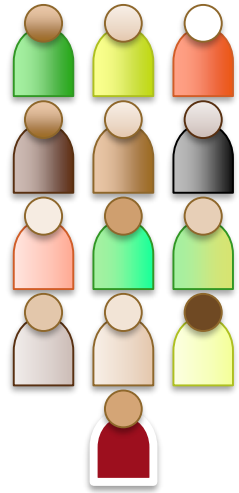
National Centre for Agri-Food Climate Research & Innovation

Coordinating research across Teagasc, nationally and internationally through a virtual Centre

Providing visible leadership

Accelerating work to bring new technologies into use





Additional staff

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FACCE ERA-GAS

MONITORING & MITIGATION OF GREENHOUSE GASES FROM AGRI- AND SILVI-CULTURE

27 Projects
32 Countries
€37 million
41 Funders

EJP SOIL
European Joint Programme

26 Countries
€80 million

Teagasc leads Science to Policy work package

GLOBAL RESEARCH ALLIANCE ON AGRICULTURAL GREENHOUSE GASES

Co-Chair, Livestock Research Group

FAO FIAT PANIS

leap
LIVESTOCK ENVIRONMENTAL ASSESSMENT AND PERFORMANCE PARTNERSHIP

Co-Chair, Technical Advisory Group on Biodiversity

HoloRuminant
Understanding microbiomes of the ruminant holobiont

HORIZON 2020

ClieNFarms
Climate Neutral Farms

Valpro Path

Climate Farm Demo

HORIZON EUROPE

ENFASYS

Novafert

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New Signpost Advisory Programme

Signpost Programme

Signpost Farms

Signpost Advisory

NASCO

(and other on-farm research)

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How will a farmer engage with the Signpost Advisory programme?

- Build on current advisory network and tools
- Involve other AKIS players, consultants, co-ops, etc
- Available to any farmer

Baseline your farm

Develop your plan

Support with implement ation

Review progress

SIGNPOST
Farmers for Climate Action

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Conclusions

- Our 2030 target is very challenging
- For post 2030 Climate Neutrality, clarity on methane and soil carbon needed
- Very encouraging that farmers are taking positive actions
- Role of technology and efficiency centre stage, but more research / widespread adoption needed
- Top priority for Teagasc
- No country will find this easy – chance for Ireland to lead