

Reducing emissions in agriculture

Professor Frank O'Mara, Director Teagasc

Veterinary Council of Ireland

25 October 2023



Outline of presentation

- What's the target?
- What can be achieved – the MACC
- The Signpost programme - Supporting farmers to take climate action
- The importance of veterinary surgeons in a multidisciplinary approach



What is the target?

51%
reduction
in GHG Emissions
by 2030

25%
reduction
in GHG Emissions
for agri sector
by 2030

Farmers need support
at three levels



Is there a roadmap through technology, efficiency and system change?



- Yes, it is possible
- It is very challenging
- Critical now to achieve phase 1
- 2 key asks of Teagasc
 - Develop more technologies
 - Support farmers with adoption

12 July 2023

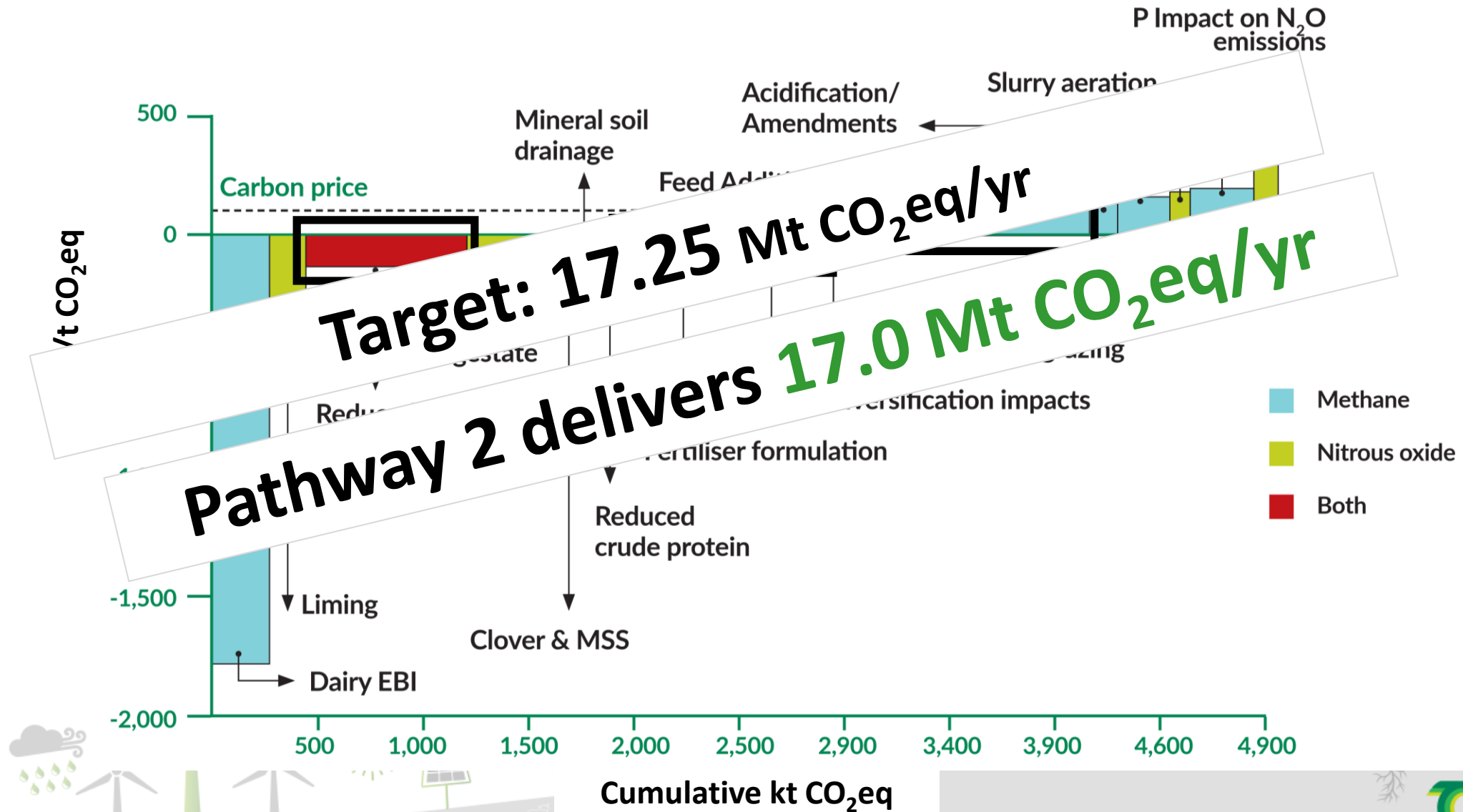
Teagasc MACC 2023

An Updated Analysis of the Greenhouse Gas Abatement Potential of the Irish Agriculture and Land-Use Sectors between 2021 and 2030

Gary Lanigan¹, Kevin Black², Trevor Donnellan¹, Paul Crosson¹, Ciara Beausang¹, Kevin Hanrahan¹, Cathal Buckley¹, Ben Lahart¹, Jonathan Herron¹, John Redmond³, Laurence Shalloo¹, Dominika Krol¹, Patrick Forrestal¹, Niall Farrelly¹, Donal O'Brien¹, J.J. Lenehan¹, Michael Hennessy¹, Michael O'Donovan¹, David Wall¹, Lilian O'Sullivan¹, Tom O'Dwyer¹, Mike Dineen¹, Sinead Waters¹, Nuala NiFlahartha¹, Pat Murphy¹, John Spink¹, Pat Dillon¹, John Upton¹, Karl Richards¹



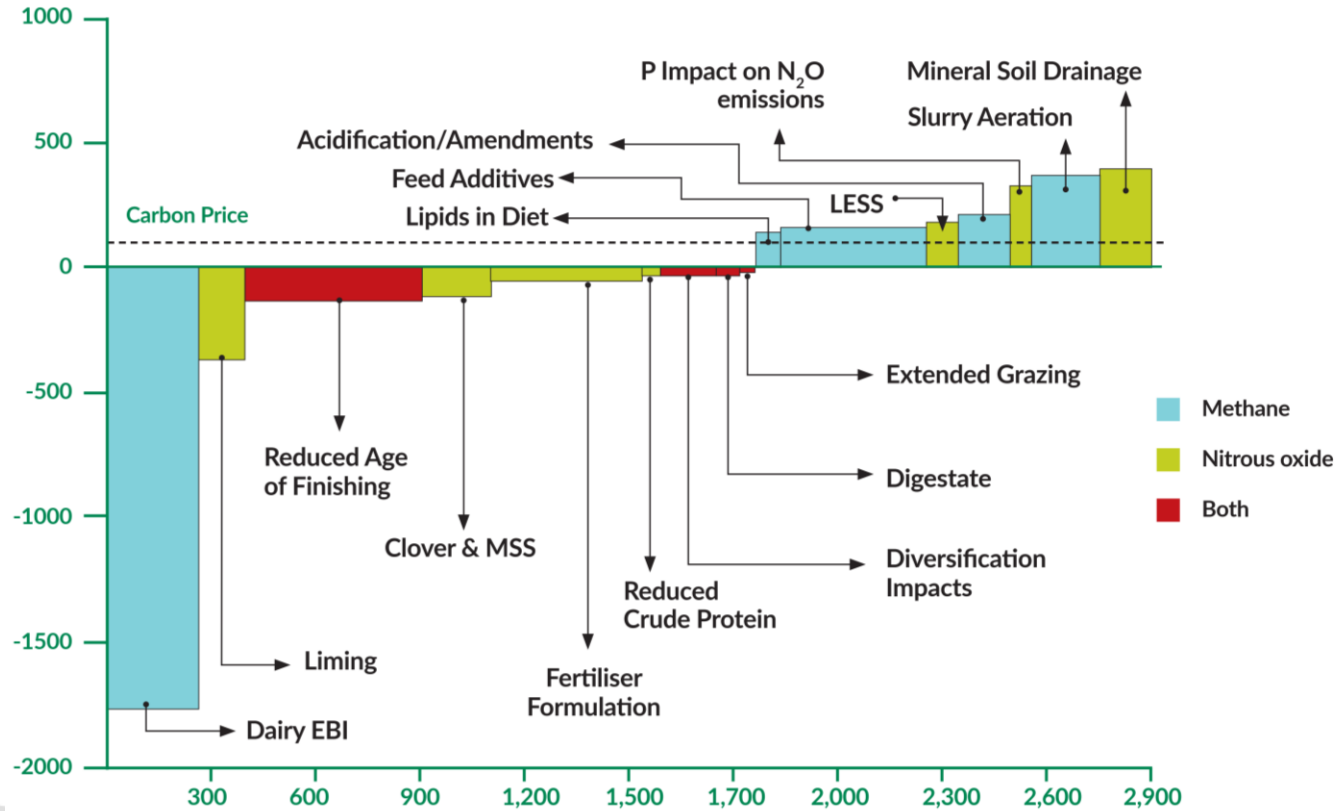
Agriculture MACC (S1) – Pathway 2 = 4,858 kt CO₂eq/yr



Research has identified promising technologies and system improvements



Teagasc MACC 2023



Where are you on the 12 Steps to reduce Gaseous Emissions on YOUR FARM?



- | Step | Action needed |
|-------------------------------------|---|
| 12. Incorporate clover | Incorporating 5 kg/ha (2 kg/ac) will replace up to 100 kg/ha (80 units/ac) of chemical N/year |
| 11. Finish cattle earlier | Use Dairy Beef Index (DBI) to produce earlier finishing cattle |
| 10. Reduce age at first calving | Calf heifers at 22 to 26 months and aim for 20% replacement rate |
| 9. Increase milk solids/cow | Milk record, cull poor cows and aim for 305 day lactation |
| 8. Improve dairy herd quality | Use high EBI bulls and increase herd EBI by >€10/year. Use sexed semen to accelerate genetic gain |
| 7. Improve animal health | Create a herd health plan |
| 6. Better grassland management | Weekly farm walk, measure grass and extend grazing season |
| 5. Reduce chemical N by 10kg/ha | Apply lime, incorporate clover and make best use of slurry / FYM |
| 4. Use 100% LESS | Apply slurry in spring / early summer using Low Emission Slurry Spreading Technology (LESS) |
| 3. Build or maintain soil fertility | Continue to use P & K fertilisers such as 18:6:12 |
| 2. Apply lime | Identify fields low in pH using soil analysis |
| 1. Use protected urea | Apply protected urea instead of CAN/straight urea |

The adoption rates are very challenging

Reduce nitrogen fertiliser use by 30%

Protected urea constitutes 95% of straight fertiliser nitrogen

Average age at finish of beef cattle reduced by 3 months

Feed additives fed to 50% of dairy cows during grazing and 65% of housed cattle



Uptake Rates of Measures – 80% of Total Mitigation

Measure	Pathway 2	Description of mitigation measure
N-reducing measures (liming, legumes, LESS)	30% (285,757 tonnes N by 2030)	Reduction in total N
Fertiliser Formulation (Protected Urea, low-N compounds)	100% 95% 65%	Straight urea to protected urea CAN to protected urea Nitrate-based to ammonium-based compounds
Reduced Age of Finishing	3 months	Reduction in average age at finish of prime beef cattle
Feed Additives	50% 65%	Feed additive to dairy cows during grazing Feed additive to cattle during housing
Diversification Impacts (Destocking & Use of Digestate)	137,963 LU 3,500,000 m ³	Displacement of animal numbers Volume of digestate
Manure Management	40% dairy 20% other	Slurry aeration or acidification

How can we accelerate the rate of improvement?



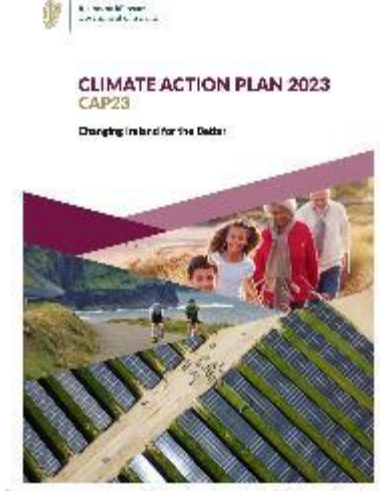
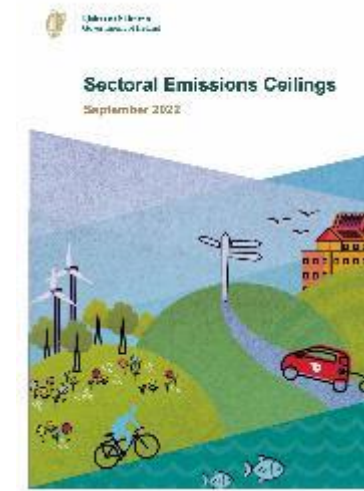


Policy drives change



Number 32 of 2021

Climate Action and Low Carbon Development (Amendment) Act 2021



But there are other levers of change also

Research



Incentives



Farmers need support
at three levels



Policy



Incentives



Research,
Advisory and
Education



Advisory Services/
Education



Penalties



Teagasc Climate Action Strategy

3 Key Pillars of Climate Action

Signpost
Advisory
Programme

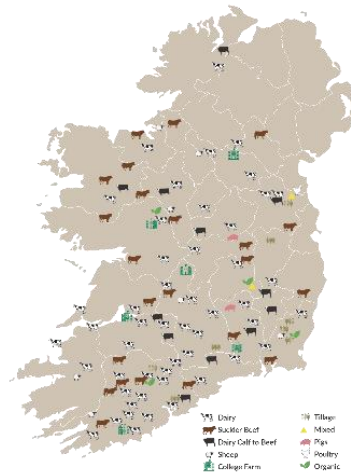
AGNA



icbf



Signpost Advisory Programme



120 Farmers
Signpost Demonstration Farmers



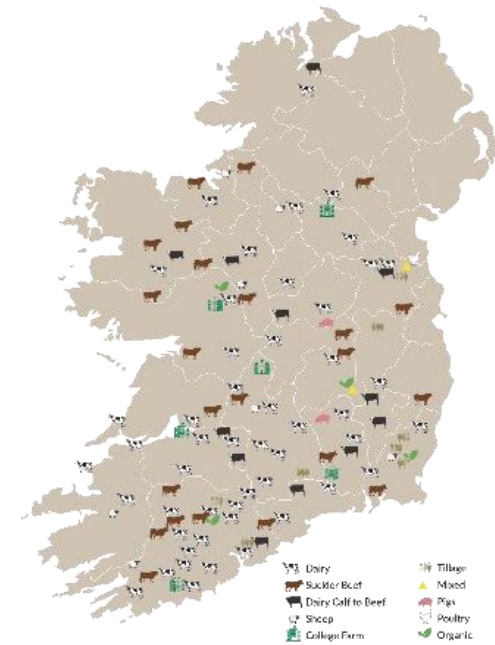
62 Partners
consisting of farmers, industry, state bodies, farm organisations & media

Signpost
Advisory
Programme



Signpost Programme – network of 120 farmer demonstration farms

1. Plan



2. Implement



Where are you on the 12 Steps to reduce Gaseous Emissions on YOUR FARM?

Action needed

1. Use protected urea
2. Apply lime
3. Build or maintain soil fertility
Use Emission Slurry/Spreading Technology (LESS)
Continue to use P & K fertilisers such as 18&:12
4. Use 100% LESS
5. Reduce chemical N by 10kg/ha
6. Better grassland management
7. Improve animal health
8. Improve dairy herd quality
Use high EBV bulls and increase herd EBV by >€10/year.
Use sired semen to accelerate genetic gain
9. Increase milk solids/cow
Milk record, cull poor cows and aim for 305 day lactation
10. Reduce age at first calving
Use Dairy Beef Index (DBI) to produce earlier finishing cattle
Cull heifers at 22 to 26 months and aim for 20% replacement rate
11. Finish cattle earlier
12. Incorporate clover
Incorporating 5 kg/ha (2 kg/acre) will replace up to 100 kg/ha (80 units/acre) of chemical N/ha

Other actions:

- Apply lime, incorporate clover and extend grazing season
- Weekly farm walk, measure grass and make best use of slurry / FYM
- Apply slurry in spring / early summer using
- Identify fields low in pH using soil analysis
- Apply protected urea instead of CAN/straight urea

3. Farmer to farmer learning



Engagement with individual farmers crucial

Phase One: 21 Signpost Advisors recruited



Signpost Advisory Programme



Available to all farmers



Enhanced advisory & training support



“Know My Number – Make My Plan”
- supported by the Sustainability Digital Platform



Engage with 50,000 farmers between now & 2030

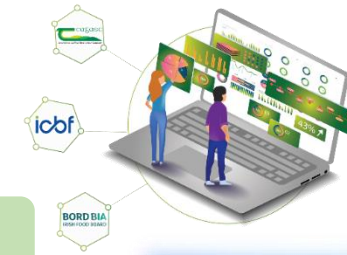
Registration & Commitment

Know My Number

Make My Plan

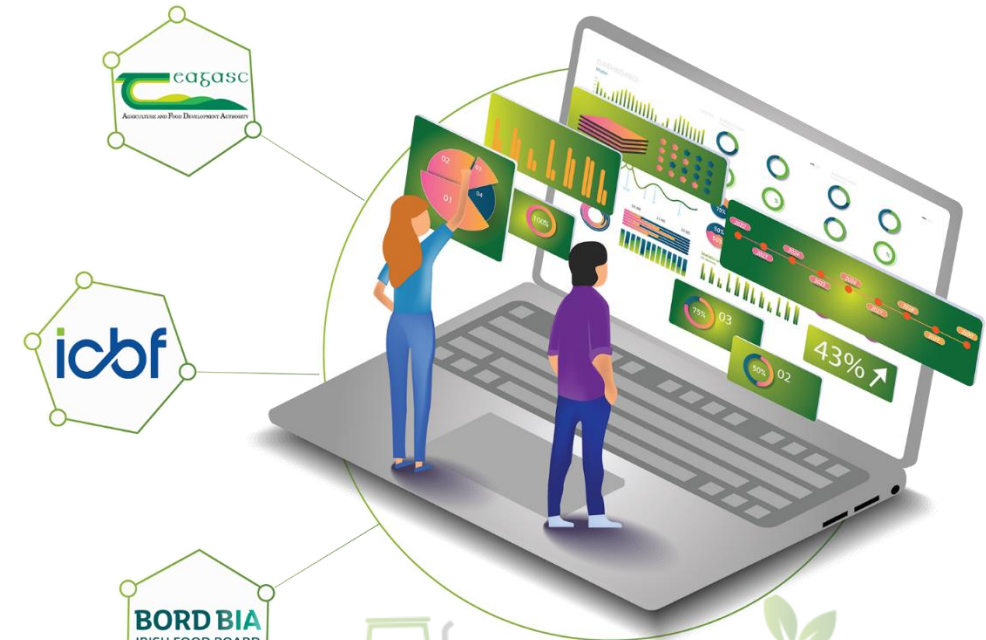
Support for Action
(3 year programme)

Emissions Reduction



Sustainability Digital Platform → AgNav

- Unique, secure online platform
- Allow farmers count carbon emissions (& sequestration) on farm
- Decision support capability
 - Tailored sustainability plans
 - Track progress



AGNAV

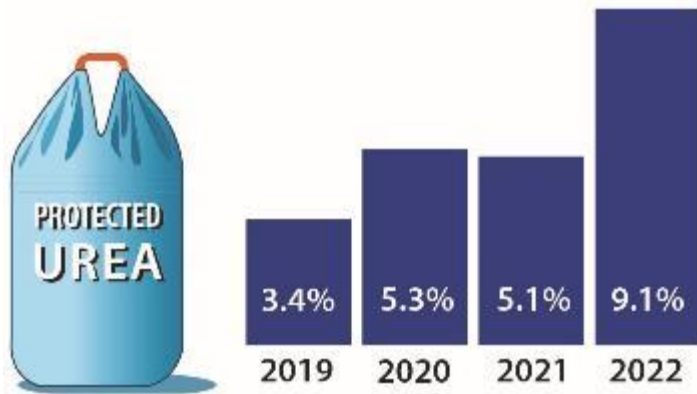
Trusted Solutions, For Everyday Farming



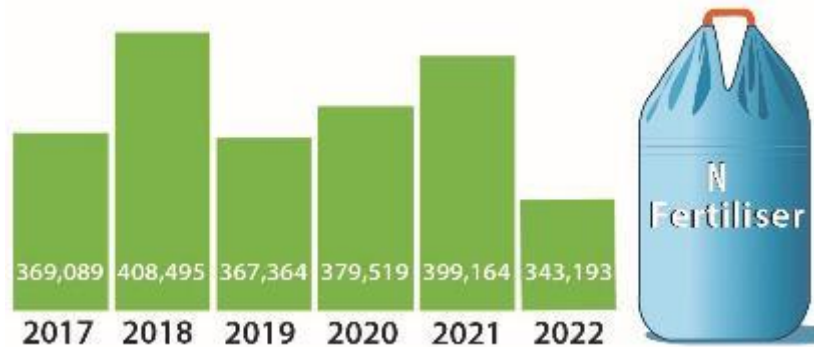
AGNAV

How are we doing so far?

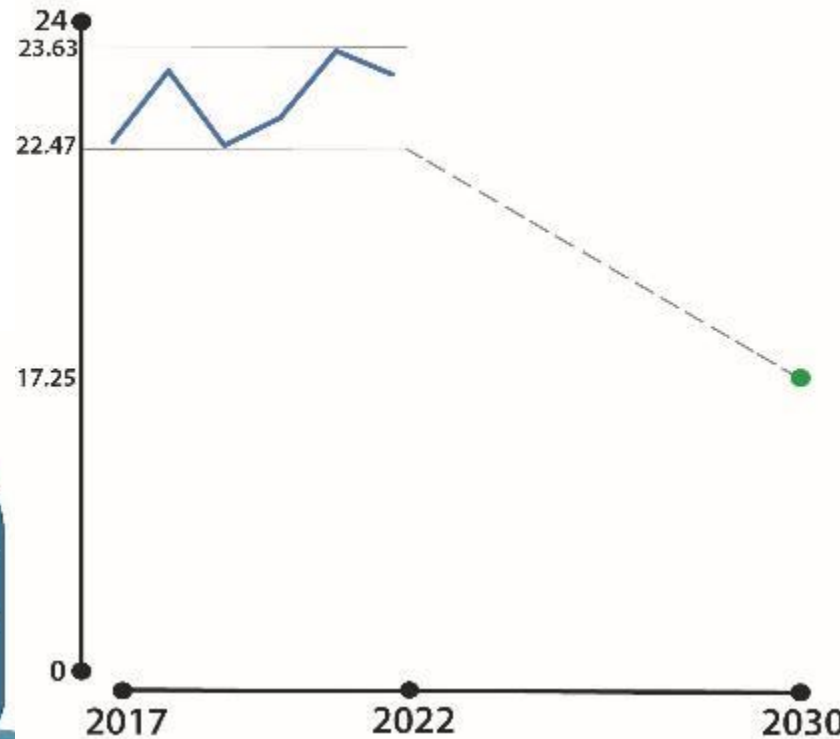
Protected urea sales as % of overall fertiliser N sales (DAFM)



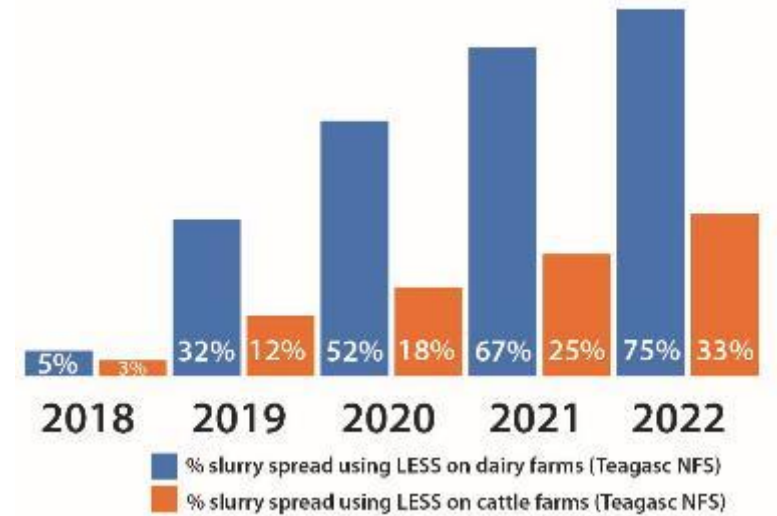
Annual N fertiliser sales (tonnes, CSO)



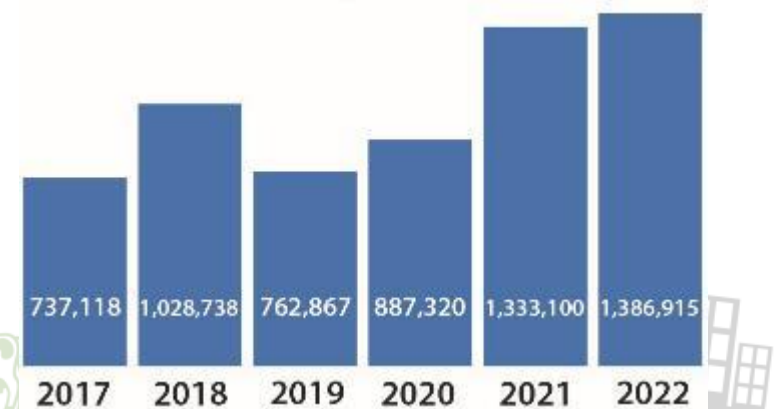
Agricultural GHG emissions (MtCO₂e, EPA)



% slurry spread using LESS on Cattle and Dairy farms (Teagasc NFS)



Lime sales (tonnes, CSO)

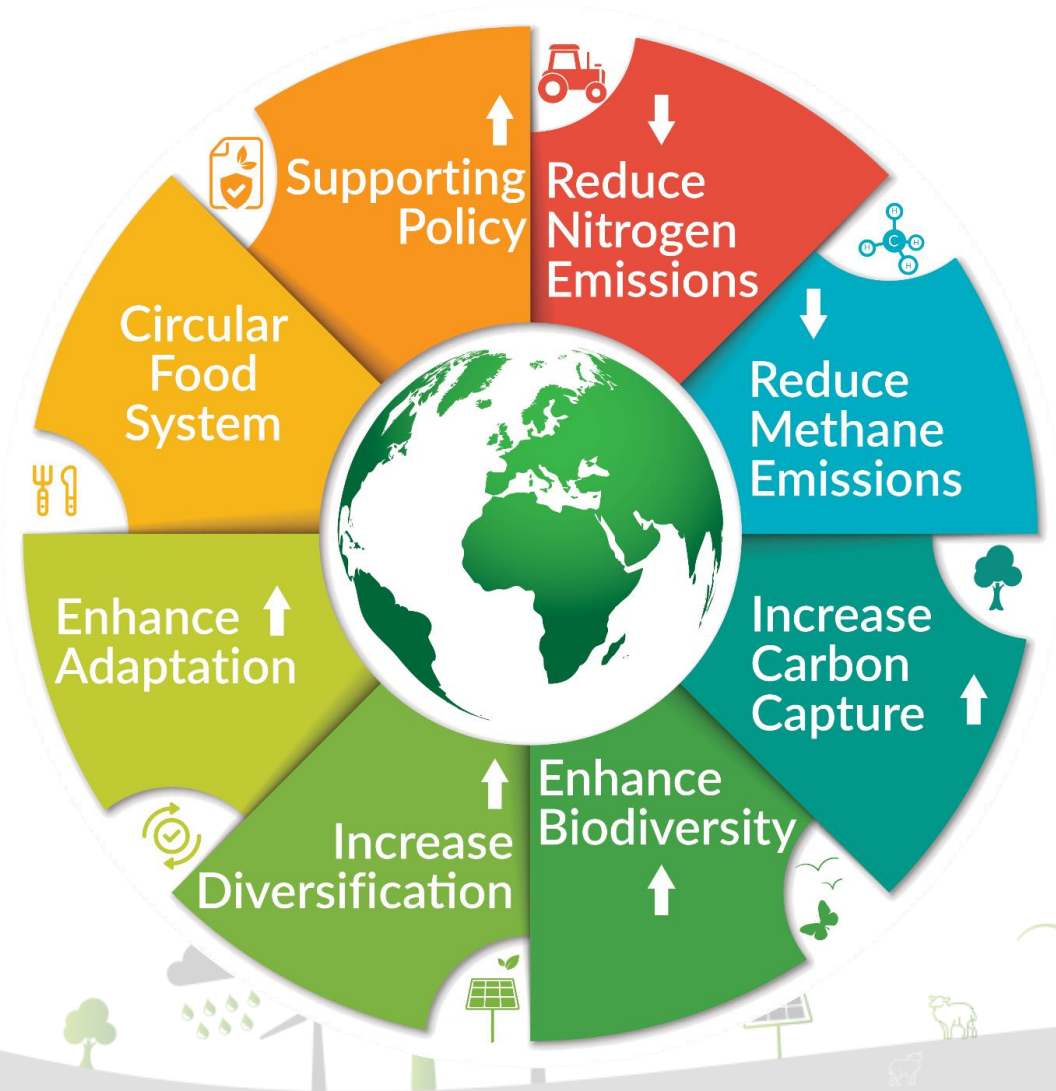


Recruiting farmers

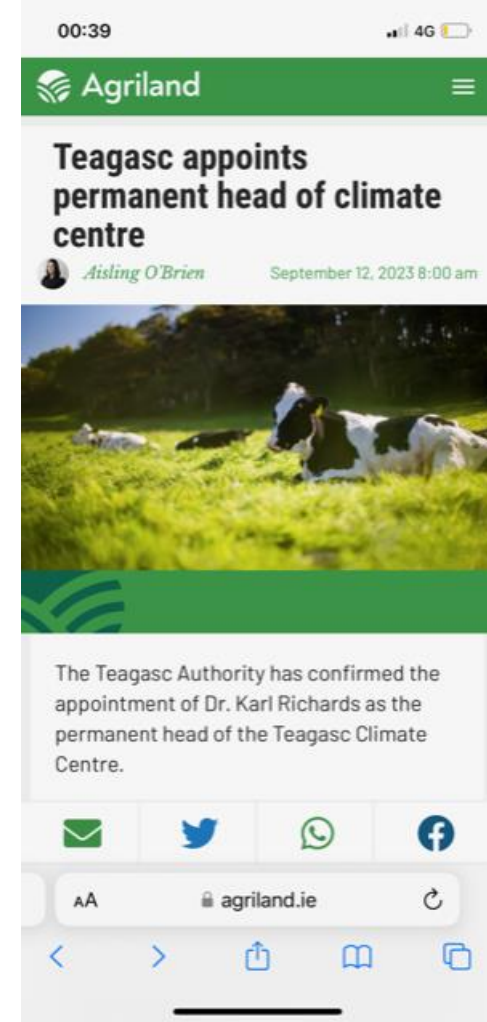
- **Farmers are already engaging**
- **Farmers with a large footprint**
- **Existing discussion groups**
- **Existing relationships**



Teagasc Climate Centre



- National focal point
- Increase Teagasc capacity
- Greater cooperation across Teagasc
- Inform national policy
- National & international collaboration
- Greater efficiency



Next steps

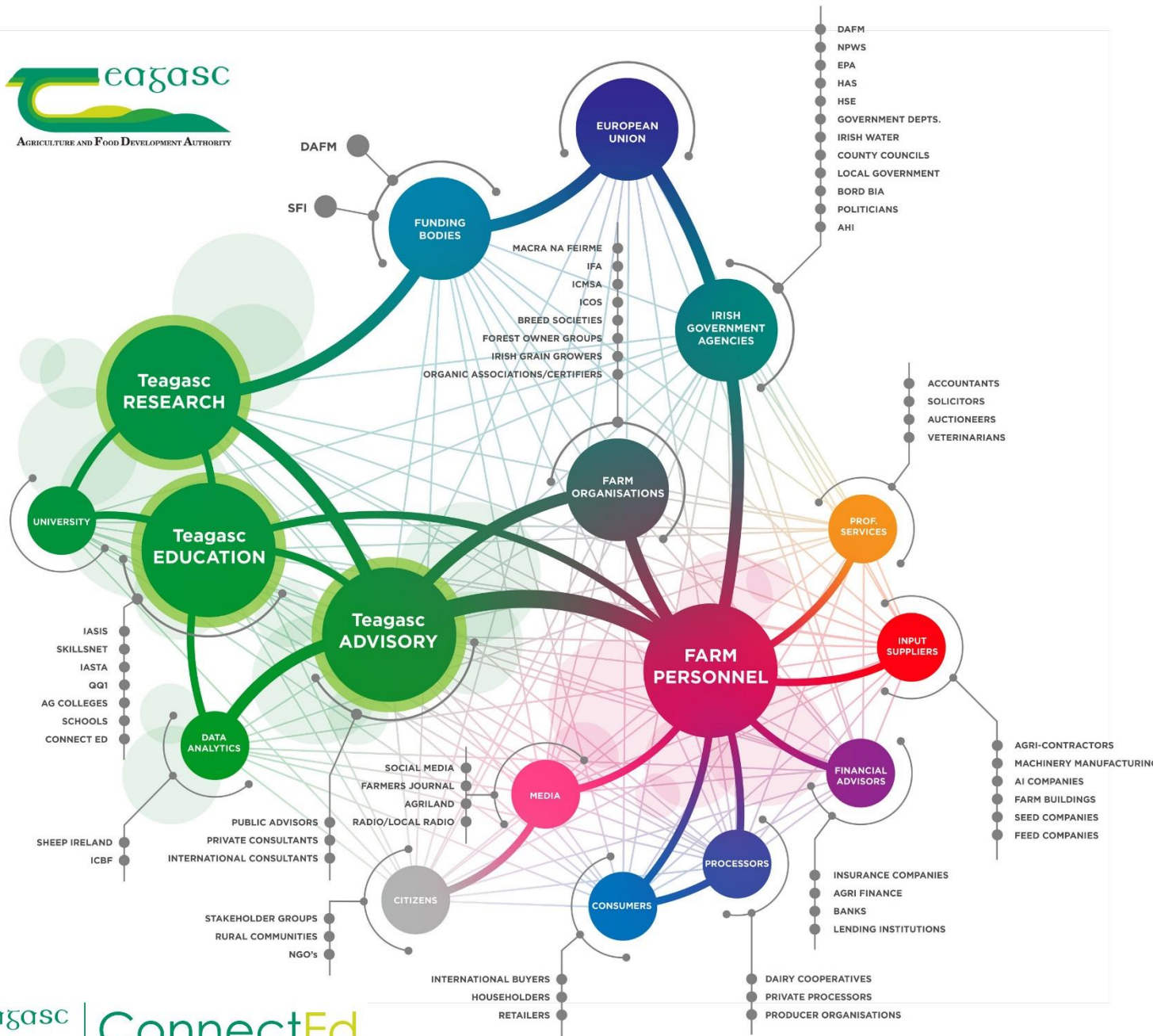
- Support farmers to develop and implement a plan
- Accelerate research to bring ‘nearly ready’ technologies to point of deployment and develop new ones
- Continue to improve the national inventory (how we count agric emissions)
- Continue to reduce uncertainty in LULUCF (land-based) emissions and sequestration



Role of veterinary surgeons in a multidisciplinary approach

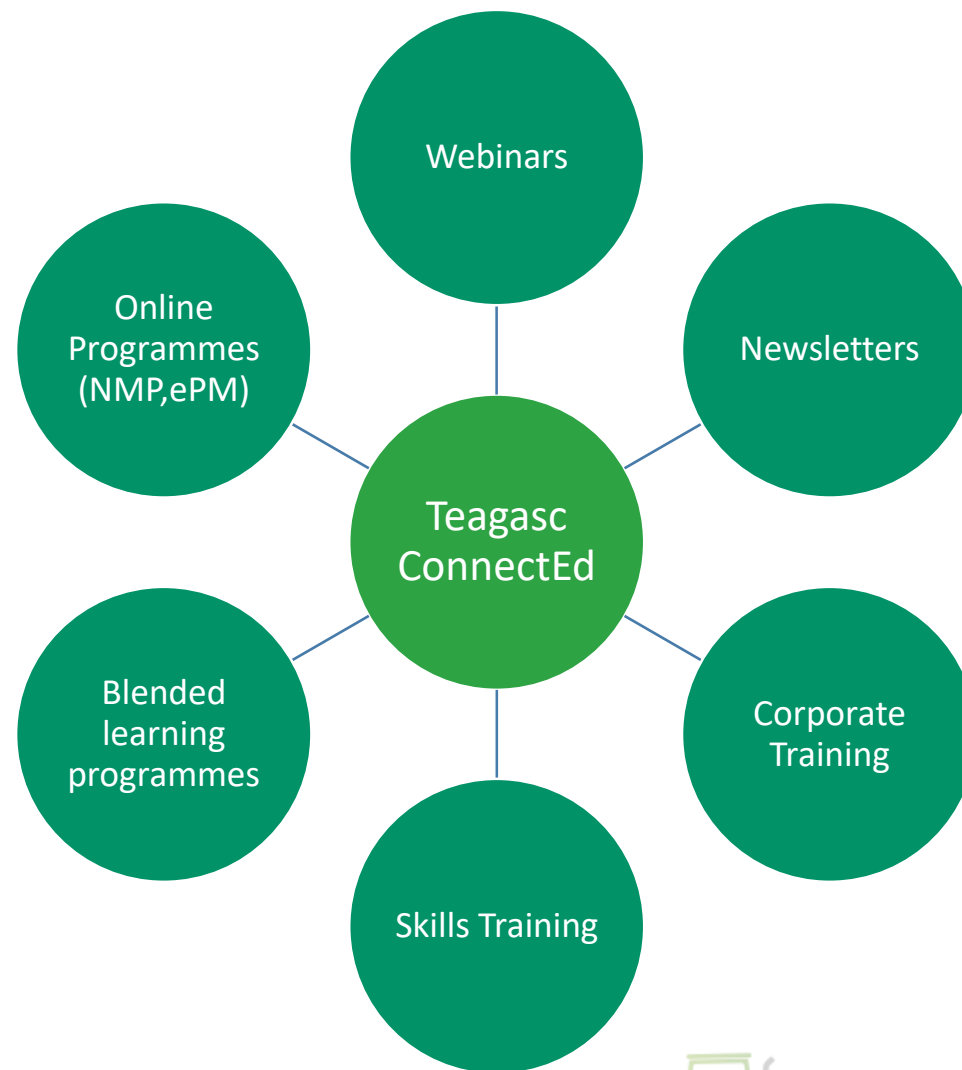
- Animal health is a key driver of efficiency and productivity
 - Replacement rates
 - Age at first calving in suckler herds
 - Continuing and further improving efficiency and productivity is vital
- Many of the important measures in the MACC are animal related
 - Reducing age at finish– driven by breed and genetics, calf rearing and health, nutrition and health during all stages of rearing
 - Dairy EBI improvements
 - Feed additives
 - Reducing CP% in concentrates





The Agricultural Knowledge and Innovation System (AKIS)

Teagasc ConnectEd





ConnectEd
Professional Knowledge Network

The Signpost Series

'Pointing the way to a low impact agriculture'

Environment Training Webinar Series
every Friday morning at 9.30am

Register for upcoming and view past webinars at:
www.teagasc.ie/sustainableagriculture

Dairy
Sustainability
Ireland

Food Drink
Ireland
Skillnet



National Rural Network

