



Irish Agriculture and GHG reduction targets: *The Search for Solutions*

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RERC

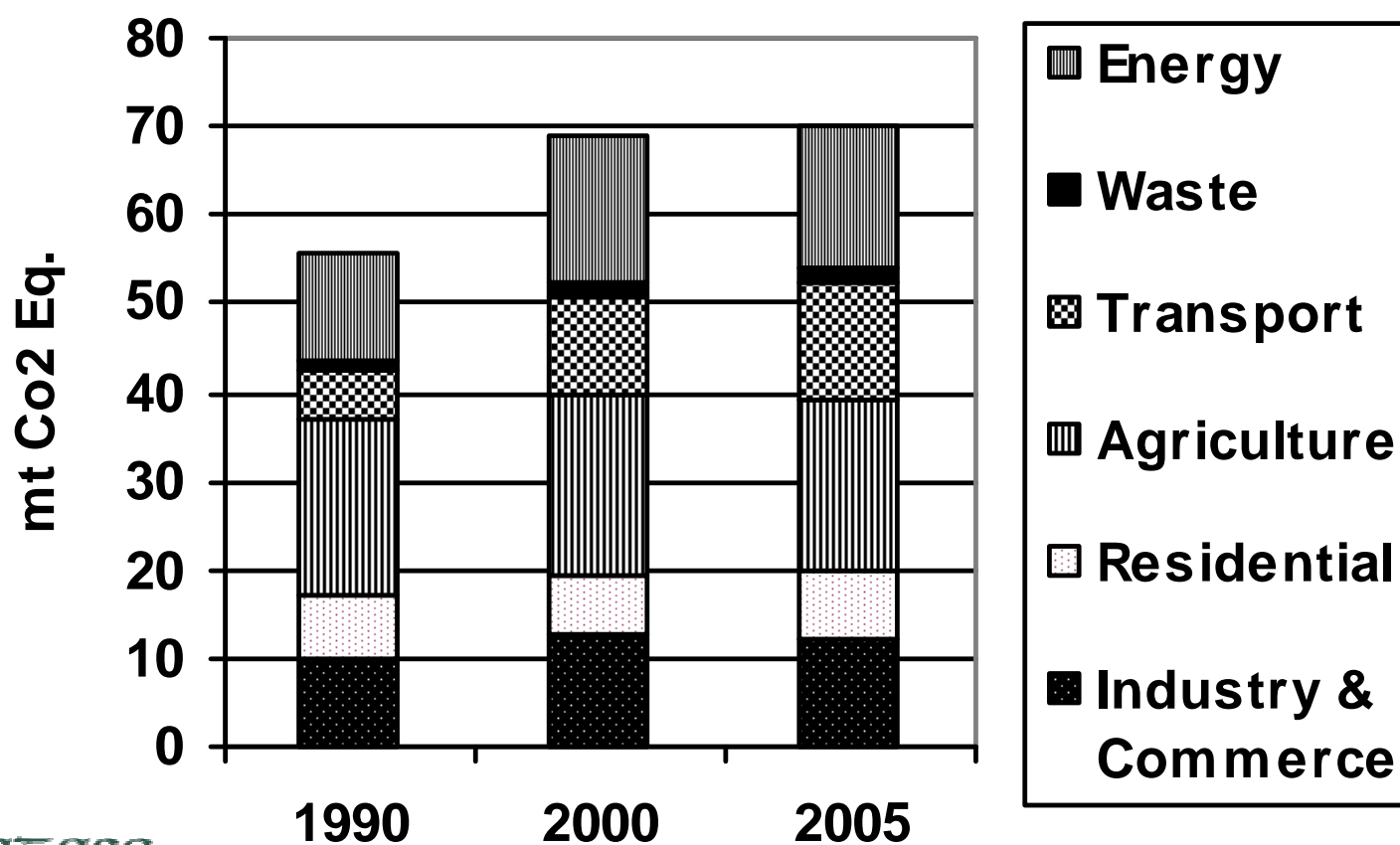


Overview

- Background to work
- GHG emissions: The National Picture
- Policy debate
- Methodology
- GHG Scenarios & results
 - Reduction Scenario
- Assumptions and uncertainties
- Summary

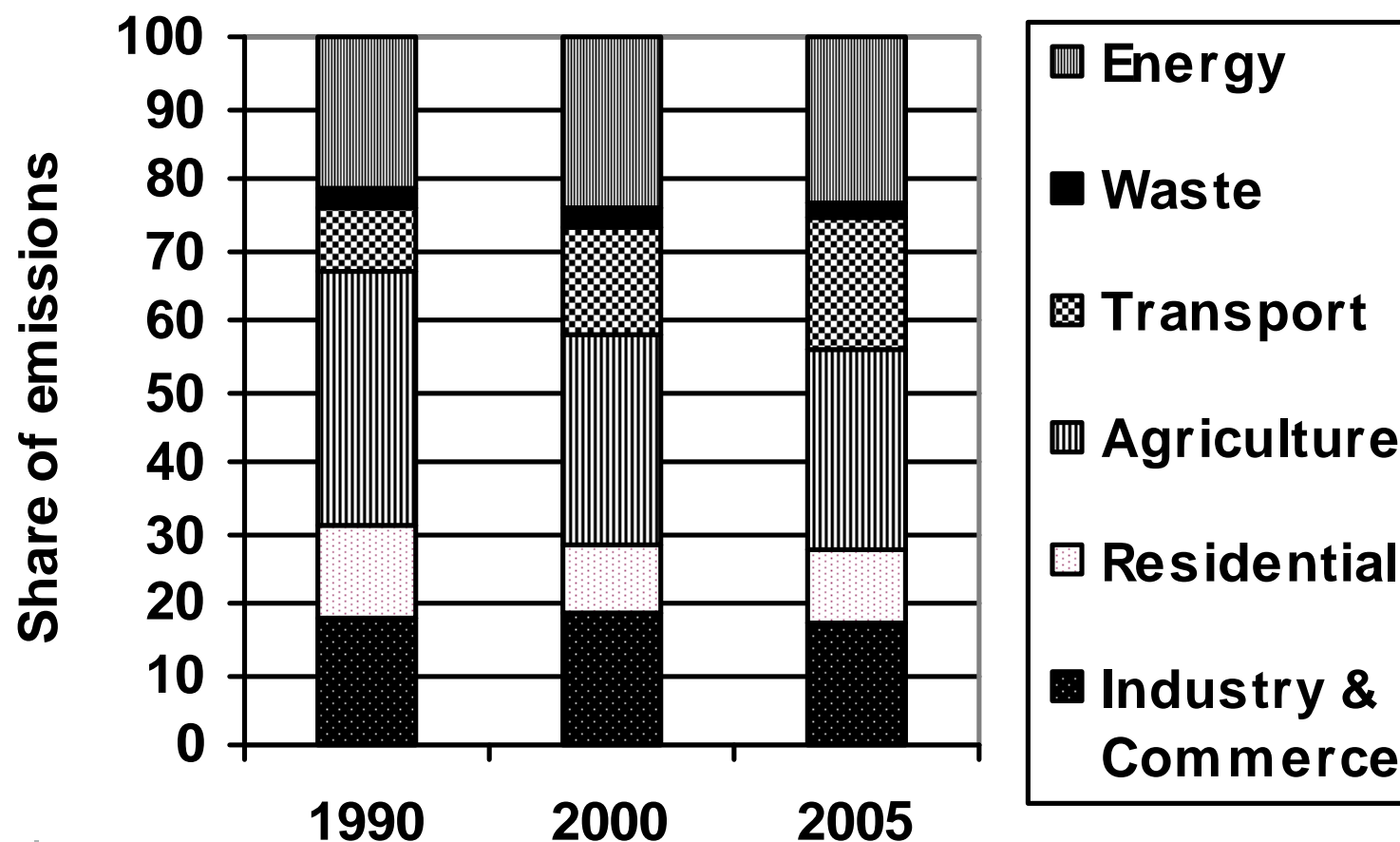


Irish GHG Emissions by Sector





Share of Irish GHG Emissions by Sector





Agriculture & Other Sector GHGs

- Agriculture is not part of the Emissions Trading Scheme (ETS)
 - the other non-ETS emission sources include transport, households, services, smaller industrial installations and waste
 - no measures in place for a reduction in agricultural GHG emissions
- Agricultural GHG emissions
 - grew substantially through the 1990s under the Mac Sharry reforms to the CAP
 - peaked in 1999 and have been in decline since
- Other GHG emissions
 - energy & transport have increased rapidly over the last 15 years
 - rising human population, increased labour force participation, and rising car ownership and usage



Motivation for Work

- Irish agriculture less important in economic terms
- But suddenly a “hot” issue due to GHG concerns
- Target reduction for agriculture is not yet clear
- Some economists touting “solutions” to agricultural GHG problem
 - Cut production, change enterprise focus, implement technological solutions
 - But do these guys understand the sector
- Do such solutions have any credibility?
- How could a substantial emissions reduction be brought about ?



There are reason why farmers do what farmers do !

- Land quality/climate
- Farm size/field structures
- Human capital
- Access to capital
- Age
- Range of socio-cultural factors
 - Specific view of what a farmer should be
- You don't go to bed as a beef farmer and wake up as a cereal farmer



Economists' Perspective

- Menu of policy actions which could deliver the desired GHG reduction (McCarthy and Scott, 2008)
- Solutions have different economic costs, but all have same climate benefit
 - In climate terms one tonne of abatement is as good as another
 - Economists seek to identify the least-cost abatement strategy
 - Least cost approach = > reductions not uniform across sectors
- The economic allocation of emission cuts across the economy does not recognise a “fair share” allocation to each sector



GHGs abatement costs

■ Abatement potentials

- Consultants working at present in Ireland to collate details on possible abatements potentials (costs and volumes) across a range of sectors

■ Objective is to build a draft abatement cost curve



Communication challenge: How economic impact is assessed?

- Some people only consider the impact on:
 - activity levels (livestock numbers, cereal area, employment in ag)
- Economists also consider impact on:
 - *value added* (essentially the profits & wages earned) from a given activity



Why is there a focus on Ag GHGs?

■ Scale Issue

- difficult to ignore 27% of GHG emissions come from Ag

■ Economic Considerations

- Suppose an activity is marginally profitable or unprofitable
- then the costs of reducing GHG emissions are likely to be low or even negative
- Some agricultural activities are marginally economic or uneconomic

■ Hence ag. emission reductions will be on the national GHG abatement menu





Role of Science

- Science and technology can deliver a more carbon efficient agriculture
- Will the contribution of technological solutions be sufficient by 2020 ?
 - ☐ Technologies will first have to be accepted by the IPCC
 - ☐ Technology change must be monitored and verified
 - ☐ Farmers have to adopt the technologies proposed
- Agriculture to make proportionate contribution to national GHG reduction target ?
 - ☐ other abatement options may have to be considered



Other abatement options

- There are other approaches
- J. Breen will talk about some of these in his presentation later



Projecting GHG emissions

■ Future GHG emission from agriculture

emission factors X future level of ag. activity

■ GHG emission factors

□ Science - work by O'Mara et al. (2006)

■ Future level of agricultural activity

□ Economics – FAPRI-Ireland



GHG Emissions

- Economic commodity model provides
 - Livestock numbers, enterprise areas and input applications
- Livestock emission factors provide
 - amount of methane produced by the animal on an annual basis
 - vary by animal type (dairy cow highest, horses, goats lowest)
- Emissions factors for fertiliser & animal waste
- Converted to methane and nitrous oxide
- GWP factors used to bring to common base of carbon dioxide equivalents



Cutting emissions

- Beef production from the dairy and beef herds
- Limiting the volume of beef produced and related GHG emissions created could be achieved by:
 - ☐ limiting the number of suckler cows and their progeny
 - ☐ limiting the number of dairy calves raised for beef
 - ☐ Some combination of the above two options
- Hypothetical targets for Irish agricultural GHG emissions for 2020
 - ☐ 10% reduction on 2005
 - ☐ 20% reduction on 2005
 - ☐ 30% reduction on 2005



Reference Scenario Process

- We “know” that milk quotas will be abolished
 - For current Reference Scenario we assume that milk quota are abolished
 - Milk yields continue to increase by about 1% per year
- We do not assume a WTO agreement
- Emission drop allow a 10% reduction target to be achieved



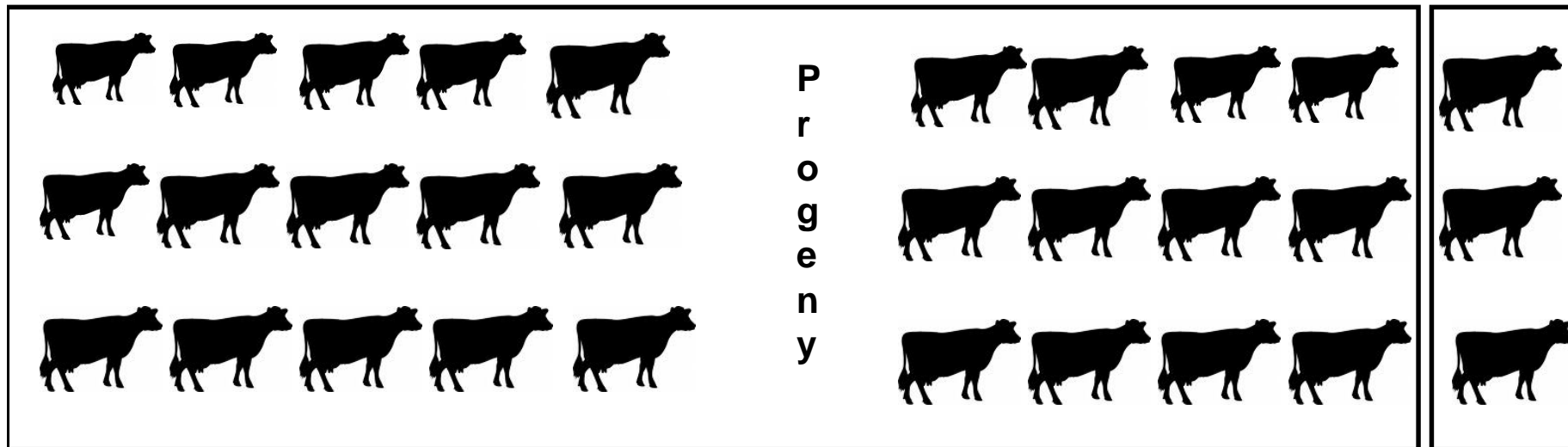
Origin of animals raised for Beef



1 Million Sucker Cows



1 Million Dairy Cows



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Beef Production

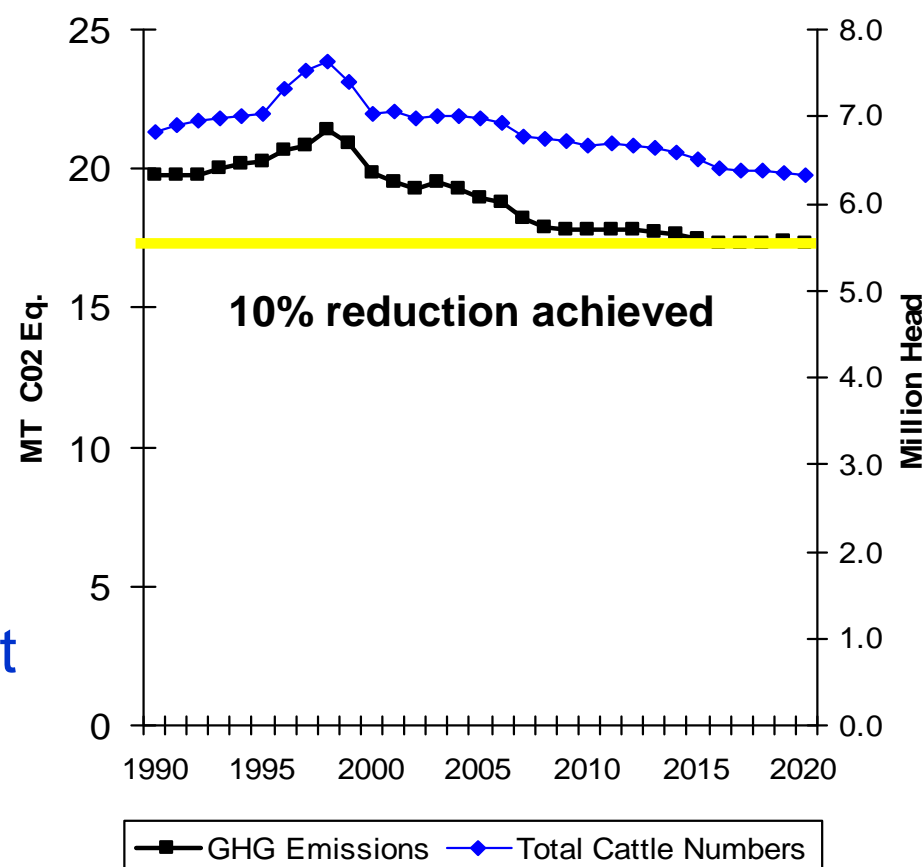
Dairy
18



Reference Run Results

2020 compared with 2005

- Total cattle population ↓ 11%
- Beef production ↓ 10%
- Cattle prices ↑ 13%
 - Prices rise as EU production falls
- Operating surplus ↓ 5%
- GHG reduction of 10% almost met

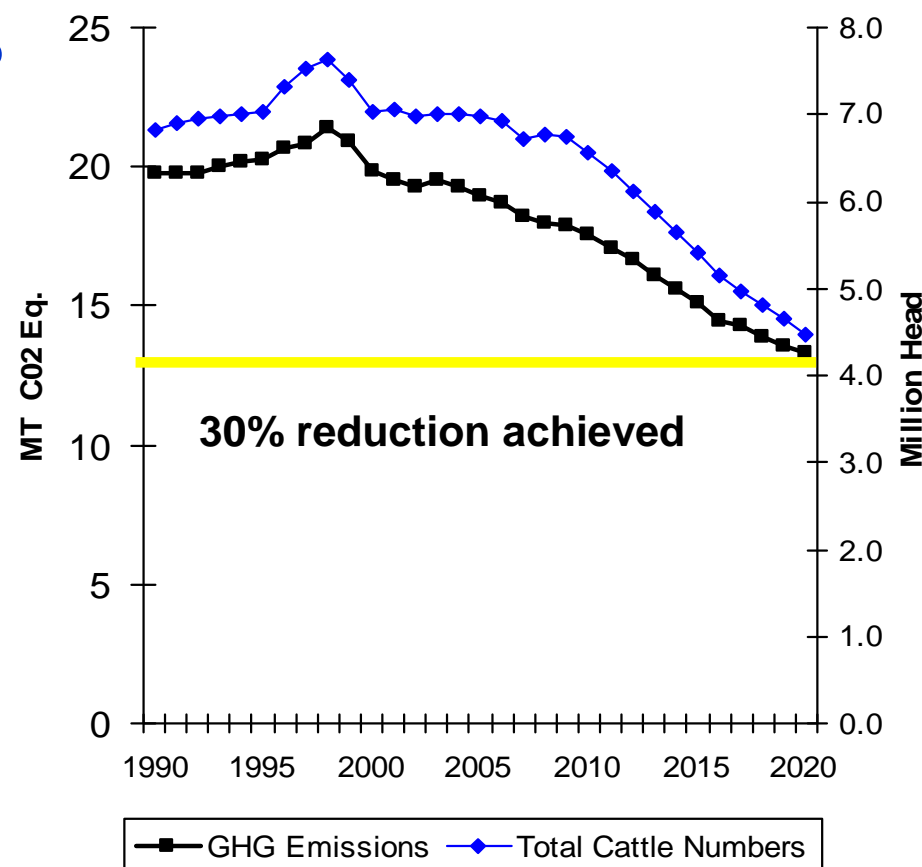




30% GHG Reduction Results

2020 compared with 2005

- Total cattle population ↓ 35%
- Beef production ↓ 32%
- Cattle prices ↑ 16%
 - Prices rise as EU production falls
- Operating surplus ↑ 2%
- GHG reduction of 30% achieved





Assumptions and uncertainties

- Agricultural & environmental policy are a source of future uncertainty
- Others drivers growing in importance in the future
 - market based supply and demand factors
 - Macro outlook, exchange rates, population growth
 - Environmental policies – e.g. level of REPS participation
- Macro factors such as €/US\$ x rate
 - Impact on competitiveness, prices and production



Summary

- Projected future emissions are likely to change as policies change
- Agriculture in Ireland may need to play a part in meeting GHG targets
 - Science & Tech will bring us some but not all of the way
- Our analysis indicates the possible scale of the impact on agriculture
- Design of policies will be very important in determining where the impact falls
- Future work will explore the differential impacts of various GHG abatement policies

More information

www.tnet.teagasc.ie/fapri