

Economic and Policy Issues related to Greenhouse Gas Reduction

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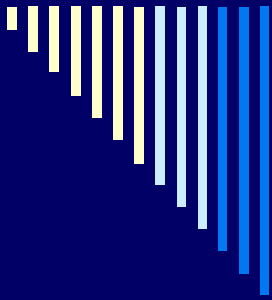
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Presentation Outline

- Why is Agriculture Being Targeted by Other Sectors?
- Agriculture and the Global Economy
- Agriculture and the Local Economy
- Growth Prospects and Cost of Mitigation
- Policy Options
- Unknowns



Why is Agriculture Being Targeted by Other Sectors?

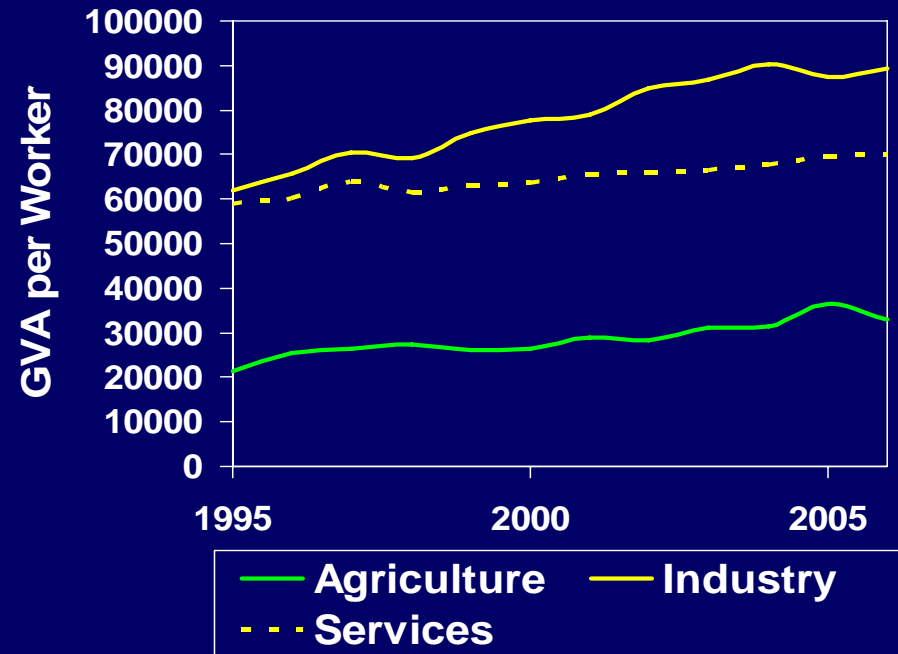


Cost of GHG mitigation (I)

- **Cost of mitigating a tonne of GHG will vary**
 - across economic sectors
 - within economic sectors
- **Economics searches for lowest cost solutions:**
 - Technological progress to ensure emissions are reduced
 - change in production process, feeding coconut oil
 - Changing behaviour to ensure emissions are reduced
 - (e.g. through incentives such as subsidies/taxes/regulation)
- **Emphasis is on finding lowest marginal cost of mitigation**

Cost of GHG mitigation (II)

- Measuring mitigation cost, relevant measure is **not** the impact on output
 - i.e. The loss to the sector would not be the foregone production of milk, beef etc.
- Relevant measure is the **impact on income**
 - Gross Value Added (contribution to GDP)
- Agriculture's GVA per employee is low

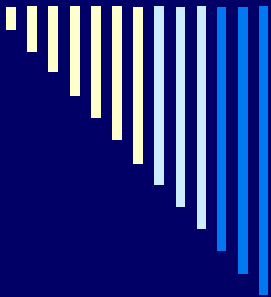


- High emissions from agriculture (28%) relative to GDP (2.5%)
- Concerted effort of other sectors to ensure agriculture takes the hit



Cost of GHG mitigation (III)

- Therefore as Agriculture has a lower Value Added per employee than in other sectors, the economic cost of reducing emissions by reducing production may be lower than other sectors
- Also, **implication** of this argument within the agricultural sector are that lower value added sub-sectors should bear proportionally more of the cost than higher value added sub-sectors
- **But Agriculture is different to other sectors**



Agriculture and the Global Economy



Global Dimension

- Agriculture and Food production needs to be seen in **international** context and not **national** context
 - Global warming is a **global** problem !
- Global Demand for Agricultural products outstripping World Population Growth
- **1983-2003**
 - World Pop. → **+ 35%**
 - World GDP → **+ 90%**
 - Agriculture Output → **+ 52%**
 - **Stern Review (2007)**
- **World Population expected to grow**
 - 6.6 billion (2007) → 8.9 billion (2050) – UN
 - Increased demand for Food



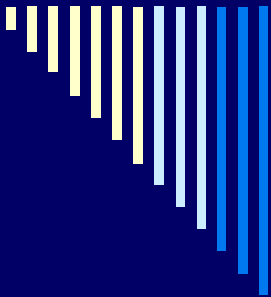
Demand for Agricultural Production

- From point of view of GHG reduction in Agriculture → Biggest reduction if there is a reduction in animal based production globally → **Is this feasible or even desirable?**
- **Trend in fact is in opposite direction**
 - Countries with growing incomes have experienced increasing per capita meat and dairy consumption
- **Growing population and wealth will increase global demand for meat and dairy products**



Good vs Bad Emissions

- **Easier to reduce global GHG's by reducing energy based emissions which have alternatives → “Bad Emissions”.**
- **Food however is a necessity without alternatives → “Good Emissions” – required for life → like CO2 emissions from living creatures**
- **There are some technological solutions in Agriculture but global reduction in demand is not achievable**
 - **Reducing Irish herds are likely to increase herds internationally, leaving no change to the global problem**
 - **Stern Review does not advocate reduction in herd numbers**
- **Therefore Agriculture should be treated differently**



Agriculture and the Local Economy

Local Economic Activity

	Agriculture as % of Income from Employment	% of Employment from Agriculture
Rural		19.6
Village (200-1000)		4.7
Town (1500-2500)		9.2
Town (3000-4500)		1.1
Town (5000-9000)		2.5
Town (10000+)	1.2	2.1

➤ Agriculture an important source of income in rural areas.

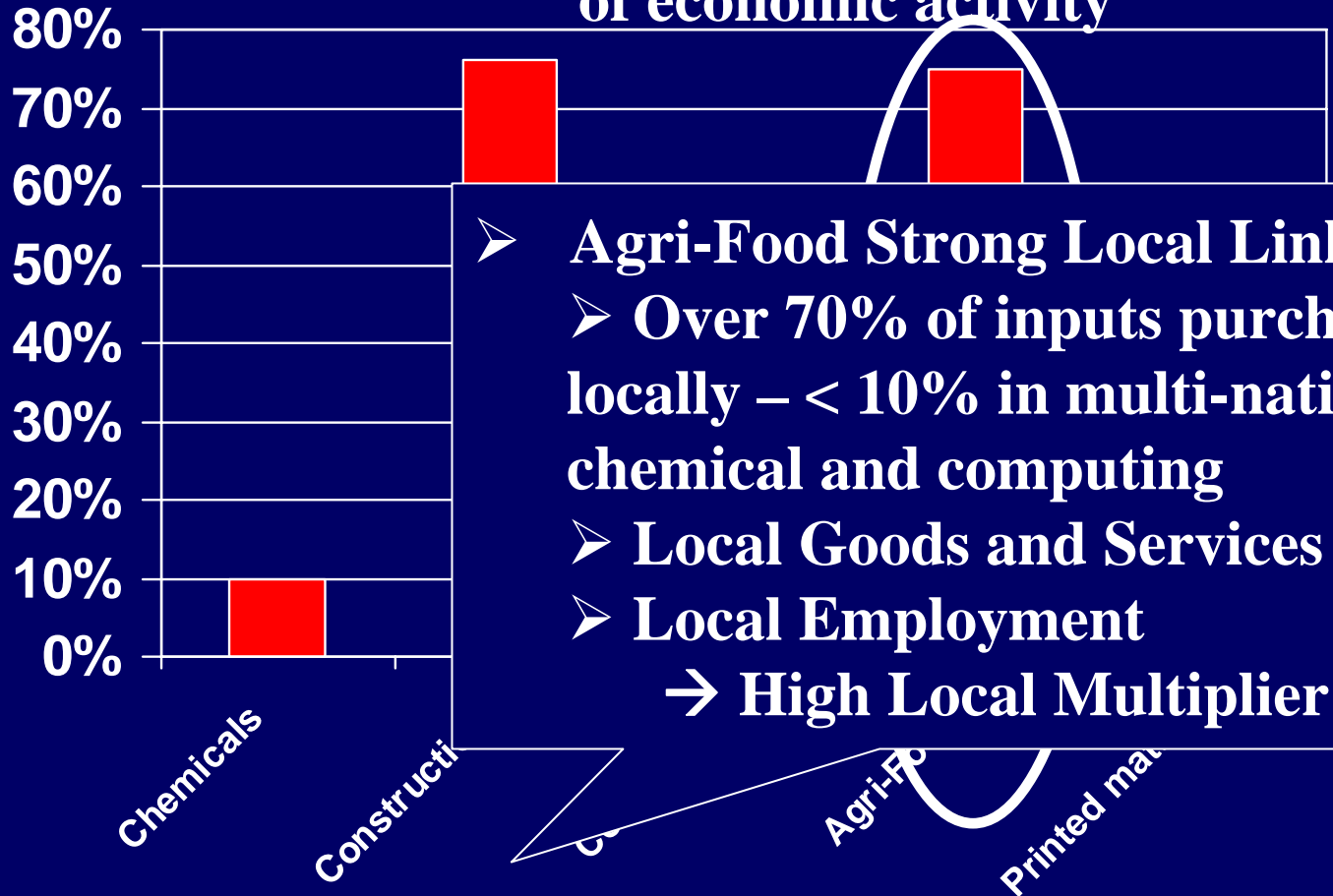
➤ Even more important in remote rural areas.

NB Cities which have lower percentages are excluded from analysis

Agri-Food: Strong Local Linkages

Top 5 Economic Sectors ~ 45% of economic activity

% of Inputs Bought Domestically



- **Agri-Food Strong Local Linkage**
- **Over 70% of inputs purchased locally – < 10% in multi-national chemical and computing**
- **Local Goods and Services**
- **Local Employment**
- ➔ **High Local Multiplier**



Green Isle

- There are also many non-monetary benefits from agriculture
- Clean green island → positive image that assists in promoting tourism and selling high value added products and services from other sectors
- Custodians of the countryside → maintains natural resource for benefit of citizens and visitors



Growth and Cost of Mitigation



Economic Outlook for Agriculture

- **Market based Profits depend upon**
 - Price and Volume of Outputs
 - Price and Volume of Inputs
- **World output prices are rising**
 - In nominal terms → may even rise in real terms
 - Reversal of historic trends
- **Caution**
 - Irish prices for many commodities are well above world prices
 - The **supports** (import tariffs, export subs) that keep prices above world level **are being eroded** (CAP and WTO reform)
 - Irish **nominal prices will rise more slowly** and real prices may decline
 - **Input prices are rising** (Fuel, Fertiliser, Feed)



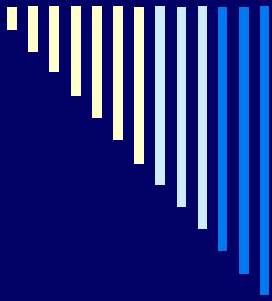
Economic Outlook for Agriculture

- Income growth will depend
 - More on volume (expansion) based growth **exploiting economies of scale and natural cost efficiencies** than price growth
- Opportunities for this expansion arise from
 - Growing world demand for food and fuel **and**
 - Policies that allow for expansion such as milk quota removal



Economic Outlook for Agriculture

- Important therefore to
 - **Improve efficiency** to reduce cost base to avoid profitability being eroded by rising costs and inputs
 - Having identified technologies for expansion, **improve dissemination and adoption** to facilitate expansion
- GHG Policies targeted to reduce production
 - May **nip farmer confidence in the bud** to proceed with expansion plans
 - Reduce capacity for transformation – **particularly for move to higher valued products**



Policy Options for GHG Reduction/Maintenance



Carbon Taxation/Subsidies

- Tax levied on goods in proportion to the GHG emitted
 - Leads to lower compliance costs as those who find it cheaper to reduce emissions more, do so
 - Serve as a continuous incentive to reduce emissions and innovate.
- However unless they are implemented multi-laterally, they can pose a serious competitive burden.
 - Only feasible if all competitors pay the same tax.
- As poor spend higher proportion of income on food
 - Tax is quite regressive
- Because of **inertia** and time taken to change technology or process
 - It may take time for instrument to take effect.
 - Uncertainty about how much to charge
- **Subsidies can also have the same effect**
 - Where higher subsidy is paid depending upon how much of targeted reduction is achieved → Suffers from the same pitfalls



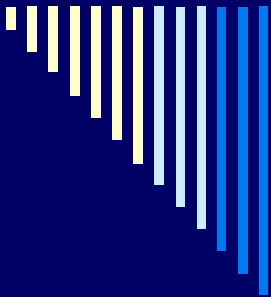
Emission Standards/Regulation

- ❑ Regulation based instruments such as quota restrictions **are more targeted** in achieving policy objectives
- ❑ However they may **inhibit** more cost effective and productive farmers from expanding
- ❑ Issues in relation to the **allocation** of the initial quota
- ❑ How to **ensure compliance** → requires inspection and charges
- ❑ Should quota remain constant or change **over time**?
- ❑ How much quota to set to achieve targets?



Emissions Trading

- **Tradable quota operates like trading permits**
 - Emissions are traded not livestock or milk volume.
- Limits production to a certain maximum level but **allows more efficient farmers to buy quota**
 - Similar issues as quota
- **Competitiveness issues**
 - Need to protect production constrained by emissions targets → justification for tariffs
- **Emissions trading scheme for agriculture justified on grounds of global need for food**
 - Emissions trading needs to be international
 - Needs to be confined to Agriculture → **no trading with energy sector.**



Interaction with other Policies



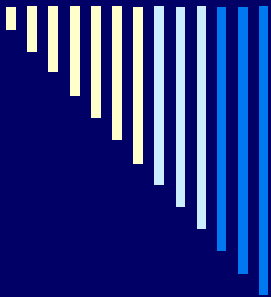
Emissions Balance Sheet

- At present **Agriculture and Forestry** are treated separately
 - As farmers are most likely to plant → division creates problem
- If a farmer **switches from livestock to trees** there should be a **double abatement benefit** for Agriculture
 - Agriculture Credit: **Abatement** of livestock reduction
 - Agriculture Credit: abatement due to increased afforestation and **sequestration (instead the Forestry is credited with abatement)**
- Similarly in **Fertiliser**
 - Production of 1t of fertiliser-N = 3t of CO₂ emissions; reducing fertiliser N = large reductions in CO₂. Current Kyoto accounting does not give fertiliser users credits for this

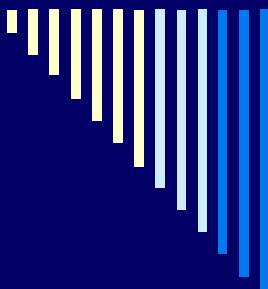


Interaction with other policies

- **Abatement strategies require Environmental Impact Assessment**
 - Nitrates Directive
 - Water Framework Directive
 - Habitat Directive
 - EU Thematic Strategy on Soils
- **Example of synergy**
 - Denitrification inhibitors may reduce nitrous oxide emissions and nitrate leaching simultaneously
 - Should aim for **win-win** policies
- **Example of antagonism**
 - Forestation: should be evaluated in relation to P-loss to water
 - Biofuel crops: should be evaluated in relation to soil quality and biodiversity

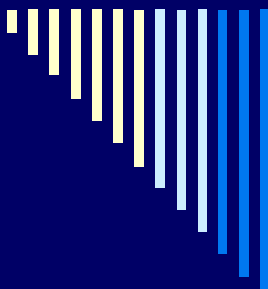


Unknowns



Unknowns (I): Global warming vs starvation

- Already food price inflation is causing problems around the world
 - Protests Mexico, Riots Egypt
 - Export taxes Argentina
- The world may realise that achievement of emissions abatement must exclude food production
 - Is feeding a rising global population compatible with limiting the emissions from agriculture ?
 - Otherwise those least responsible for GHG problem may bear the brunt of the effects of the solution



Unknowns (II): What will other Countries do?

- Will there be Agricultural emissions abatement in other countries ?
 - Will this reduce the growth in agricultural production ?
 - Lead to increased commodity prices
 - Creates more export opportunities for Ireland
 - Increase the cost to Ireland of a decision to enforce abatement of Agricultural emissions



Research Requirements

- Regardless of decisions on GHG, we will operate in a more emissions constrained world → **what is the “best” solution for the sector**
- We need **more precise measures of impact** → effectiveness of abatement strategies is based on standard emission coefficients; in reality, effectiveness depends on geo-environment.
- What **types of policies will help to achieve these objectives** are there trade-offs between different policies?
- Need to **better understand response of farmers** to policy and incentives.
- How would **GHG based policies affect other** (market and environmental) based policies?



Take Home Message

- **At one level there is a pure economic justification for targeting agriculture**
 - Low cost (GNP impact) of emissions reduction
- **But this is not the whole story → We must take a wider view:**
 - Food is not an ordinary good
 - Examine the global dimension
 - Differentiate between “Good” and “Bad” emissions
 - Examine the local dimension
 - Look at the categorisation of emissions



Thank You

Copies of Slides can be accessed on our
website:

www.tnet.teagasc.ie/merc