



Partnership for Change Climate Change Conference

Agriculture – Responding to the Challenge

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Overview

- Scientific & Political Context
- Climate Change & Agriculture
 - The Present Position
 - Progress to Date
 - The Key Issues
- The Next Steps
- Conclusions



Scientific & Political Context

Global warming is “unequivocal” and “most of the observed increases in temperatures over the last 60 years is very likely due to increases on human-generated greenhouse gas concentrations.”

UN Intergovernmental Panel on Climate Change

“Climate Change is the biggest challenge facing humanity.”

Minister for the Environment, Heritage & Local Government, John Gormley T.D. (European Commission seminar, February 2008)



Scientific & Political Context

Former Spanish Prime Minister Jose Maria Aznar dismisses climate change as a “new religion” that is drawing hundreds of billions of euros at a time of economic crisis.

October 2008

Next decade ‘may see no global warming’

Extract from the journal Nature – May 2008



Climate Change & Agriculture

The Present Position

- **Agriculture accounted for 26.8% of total greenhouse gas emissions in Ireland in 2007**
- **Since 1990 agricultural emissions have decreased by 1.36m tonnes CO₂ or 6.8%**
 - Improved nutrient management = 35% reduction N use in last 10 years
 - Equivalent to a reduction of over 0.5m tonnes p.a. CO₂ equivalent.
 - Reduction in age of slaughter of beef cattle
 - 1990 – 44% of cattle over 30 months of age
 - 2006 – 15% of cattle over 30 months of age

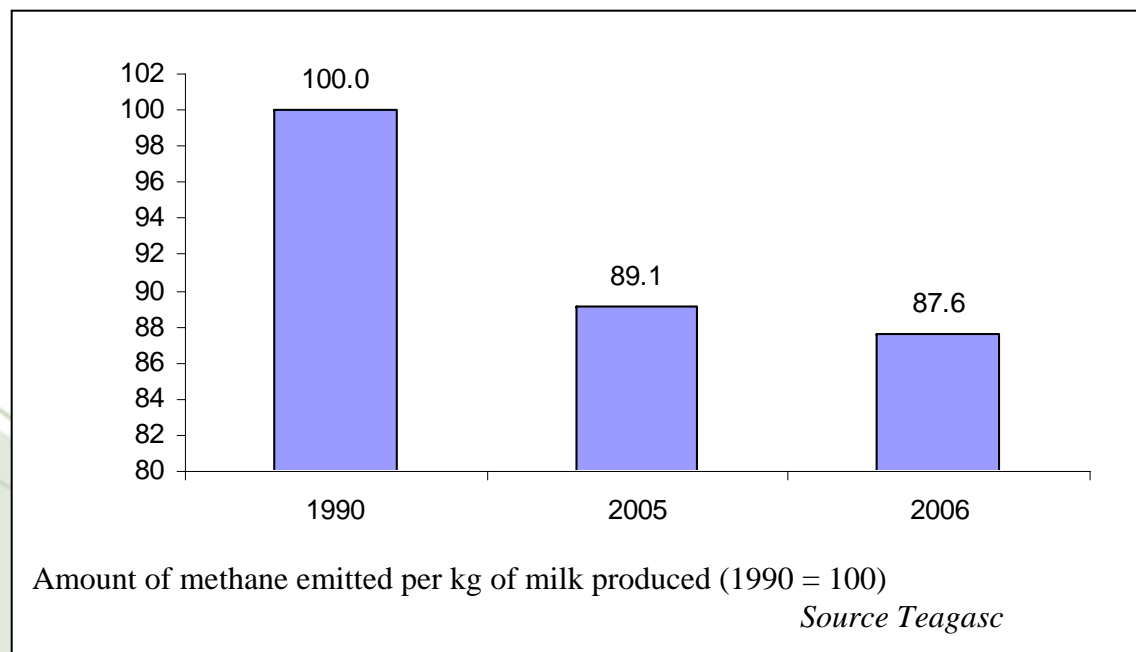
Source Teagasc



Climate Change & Agriculture

1990 - 2006

- Technological advances in dairy production = 12.4% reduction in CH₄ per kg of milk





Agriculture – The Key Issues



Climate Change

Food Supply

Water Scarcity



FOOD SUPPLY

**Global Demand for Agricultural products,
driven by population and income is
outstripping World Population Growth**

1983-2003

- **World Population** +35%
- **World GDP** +90%
- **Agricultural Output** +52%



FOOD SUPPLY

Population Trend - Global

•1950	2.1billion
•2008	6.6 billion
•2050	9.2 billion (proj)

Source: United Nations



FOOD SUPPLY

World Food Stocks

- | | |
|--------------------|--------------|
| •Post World War II | 350-400 days |
| •2003 | 133 days |
| •2007 | 57 days |

Source: Westpac



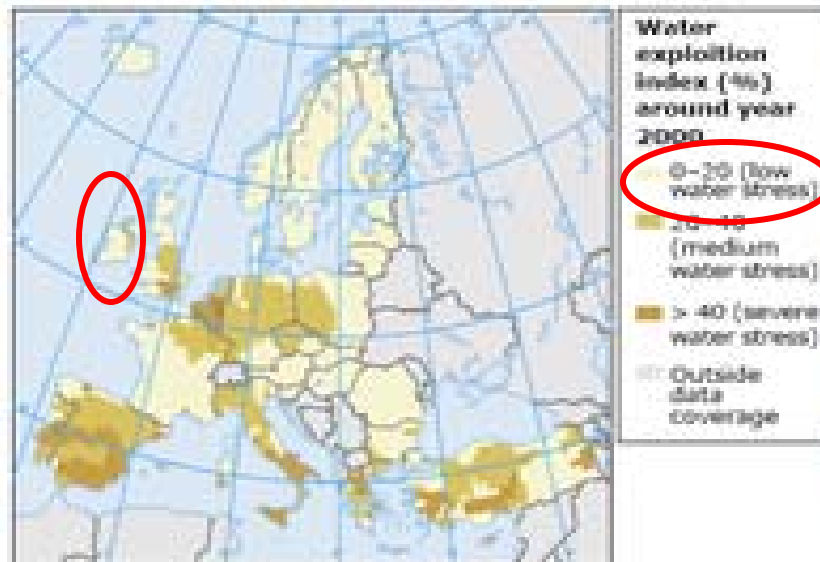
Water Scarcity

Nine European countries, representing 46% of the population are considered to be *water-stressed*.

Cyprus, Bulgaria, Belgium, Spain, Malta, FYR Macedonia, Italy, UK, and Germany

Water Scarcity

Current water stress in European river basins



Water stress in European river basins under the LREM-E scenario by 2030



Source: EEA 2005



“Incorrect Climate Change Policy may lead to Food Shortage”

Source: Sean O' Leary, IFA, November 2008



The Next Steps

Methane Abatement

Nitrous Oxide Abatement

Carbon sequestration

Renewable Energy Production



The Next Steps

Methane Abatement

➤ **Richard Keenan & Co**

- Low Energy: Hi Fibre Diet
- Increasing Feed efficiency
- Potential to reduce methane emissions associated with the production of milk by almost 20%



The Next Steps

Methane Abatement

- **UCD, Teagasc & Department of Agriculture Enteric Fermentation Research**
 - Feed additives/oils to reduce methane emissions
 - Increased animal efficiencies (reduction in GHG per unit product)
 - Reduced finishing times
 - Extend Grazing Season

- **Institut National de Recherche Agronomique (INRA) – France**
 - Combine appropriate levels of vegetable oils rich in polyunsaturate fatty acids into dairy cows feed.
 - Methane emissions through eructation and flatulence can be cut by nearly a third.



The Next Steps

Nitrous Oxide

- Nitrification & urease inhibitors in pasture and tillage
- Increasing N efficiency:
 - Use of alternative land-spreading strategies & timing of slurry application

Carbon Sequestration

- Irish agriculture is primarily grass based farm systems
- TCD & Teagasc Research
- Forestry, Miscanthus
- Grass to biogas



The Next Steps

Renewable Energy

- **Energy White Paper targets**
 - 12% renewable heat by 2020 (5% by 2010).
 - 30% co-firing with biomass at the 3 peat power plants by 2015.
 - 800 MW of CHP by 2020.
 - 10% transport biofuels by 2020 (5.75% 2010).



Bioenergy - Land Requirement

Sector	2010 PJ (ktoe)	Hectares 2010	2020 PJ (ktoe)	Hectares 2020
Heat Energy	14 (336)	60,000	21 (504)	95,000
Electrical Energy	2 (48)	12,000	17 (408)	100,000
Transport Energy	12 (288)	180,000 x 4	22 (528)	370,000 x 4
Total	28 (672)	792,000	60 (1,440)	1,675,000



Opportunities !

- Energy crops can be grown for large or small-scale units.
- Farmers can become energy and fuel suppliers for local power users, on a domestic or district-heating system. Large heat users, such as hospitals, leisure centres and schools are ideal outlets for biomass energy
- Installations of biomass boilers are becoming more frequent around the country.



Challenges !

- Confidence is lacking in the energy crop sector due to lack of infrastructure.
 - The supply chains currently exist for coal, oil and gas but are lacking in the biomass area.
 - Support needs to be provided to get local supply chains up and running.
 - If bioenergy is to become a reality it has to happen in the local parish.
 - Machinery for planting and harvesting is not readily available.
 - Most of the machines currently available are prototypes and are costly



Micro Power Generation



- MPG
 - wind, anaerobic digestion and solar energy.
- Government has already committed to
 - 15% of electricity from renewables by 2010
 - 33% by 2020.



Micro Power Generation



- MPG has the potential to
 - reduce greenhouse gas emissions
 - reduce Ireland's import bill for fossil fuels.
 - generate additional income for many thousands of farm and other businesses across rural Ireland.



Anaerobic Digestion

Table 1: Indicative energy potential from livestock slurries.

Livestock	Population June 2003 '000	Wet tonnes/year (millions)	Potential biogas m ³ /year (millions)	Potential electricity MWh/year	Electricity MWh/tonne feedstock
Cattle	6,967	84.763	1,441.0	2,641,772	0.031
Pigs	1,713	2.274	35.2	64,493	0.028
Poultry	12,738	0.404	28.8	52,810	0.131
Total		87.441	1,505.0	2,759,075	



Micro Power Generation



- Every 3 kWh of MPG electricity from wind reduces CO₂ emission by 2Kg.
 - A typical farm could generate 20,000 kWh/pa,
 - saving 13 Tonnes of CO₂ per annum.



Obstacles !

- Planning and other restrictions are slowing the roll out of micro wind turbines on farms and other renewable energy generating projects.
- Electricity load restrictions and grid connection difficulties.
- Need planning exemptions to allow for the rapid development of a Micro Energy industry



Micro Energy Policy Requirements

- Double Capital Allowance Tax Relief up to maximum of €50,000
- REFIT tariff of **22c per kWh**
 - Guaranteed for 20 year and be indexed to CPI
- Introduction of “smart metering.”
- SEI education and research support



Conclusions

- *Ireland is the second-safest from the effects of Climate Change*
(Maplecroft July 2008)
- **Response to Climate Change must be considered in the context of:**
 - **Increasing Global Food Demand**
 - **Ireland's natural resources advantage (water)**
 - **Ireland's €6.8billion food and farming export industry.**
- *“Irish beef would simply be replaced on world markets by beef produced in a much less sustainable way”*
(Minister for Agriculture, Brendan Smith T.D. November 2008)



Conclusions

- **Methane and nitrous oxide abatement research needs to become a reality and applicable**
- **LULUCF need to be accounted for in agriculture in the IPCC accounting mechanism.**
- **Emission reductions need to be attributed to source sector.**
- **Finance Bill represents a real opportunity to kick-start a sustainable on-farm renewable energy network in Ireland**

Conclusion



Ireland has the most sustainable beef production in the world.

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