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# “Green House Gas Emissions, Food Security and The Market Place”



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**“A Climate for Change”**

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**Opportunities for Carbon-Efficient Farming**

**June 2010**

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# **The UK Media's New Debate!!**

**“Give up meat – Save the Planet!”**

Allegedly Lord Stern, Times, Oct 09

**“Meat creates half of all Green House Emissions!”**

WorldWatch Institute, Independent, Nov 09

**“Go Veggie and Save the Earth, Meat means Global Disaster!”** Daily Star, Oct 09

**“Whitehall turf war saves cows' hides!”**

BBC, 26<sup>th</sup> of Nov 09

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## **“Agriculture is both a Sequester and a Net Emitter of GHGs”**

- **7% of UK GHG emissions from Agriculture (21% of NI's)**
- **1% of UK Carbon Dioxide emissions**
- **37% of UK Methane emissions (Enteric Fermentation)**
- **67% of UK Nitrous Oxide emissions (Soils)**

**NB – Methane is 23 times more potent than CO<sub>2</sub>**

- **Nitrous Oxide is 296 times more potent**
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# So Why Should Irish Agriculture Worry?



- **80% of all Irish Food production is Exported**
- **60% of Irish Exports bought by GB Retailers**
- **GB Retailer Policy coloured by Media Debate**
- **Retailers' manoeuvring to reposition Brand & take costs out of the Supply Chain**

**Tesco Commitment – “Zero Carbon” Business by 2050  
- 30% Reduction over next Decade**

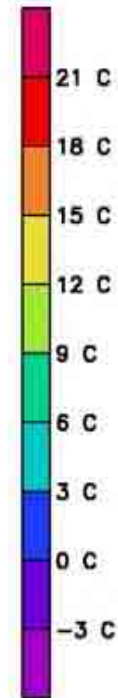
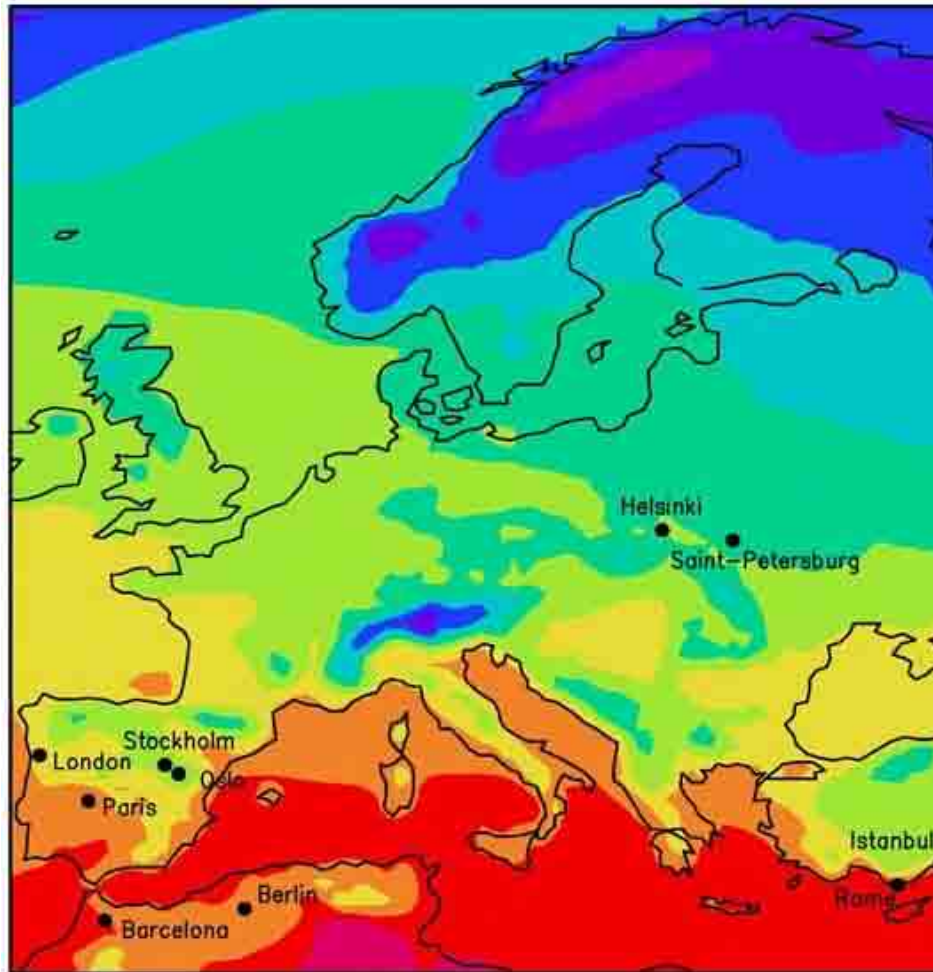
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# Why Should Agriculture Engage With Climate Change?

- **Security** of the European & Global **Food Chains**
  - More **Extreame Weather** (Droughts, Floods, Snow & Ice)
  - More **Pests & Diseases** (Blue Tongue, Brown Rot, etc)
  - **Saving Money** & Efficient Agriculture
  - New **Legislation & Policies**
  - New **Market Place** Developments
  - **Energy Security & Jobs** in the “**Green Economy**”
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# Security of the European Food Chain?

The climate map of Europe in 2080: high emissions scenario, based on temperature and aridity (but not rainfall)



The amount our climate could change is significant

Our natural environment is not adapted to the Climate of Southern Europe

This would mean significant changes to how we use land, and manage our water supply.

The affect on the more Southerly Countries will also effect us: trade and relations

International Centre for Research on the Environment and Development (France)

University of Bremen

# The Challenges – Food Sustainability &/or Climate Change??!!

- By 2050 – **80% reduction in GHG Emissions**
- By 2050 – **World Population** increase from 6 to 9bn
- By 2050 – **Global temperature increase of between 2 to 4C**
- **1C increase in Global temp. reduces Global grain yield potential by 10%** as aridity moves out from the Equator
- **Fischer Boel** – “When it comes to food production & climate change, we are caught between the devil & the deep blue sea..... But we’re not forced to accept either starvation or ecological disaster. We must find away to both feed ourselves & start to bring climate change under control.” **11/05/09**

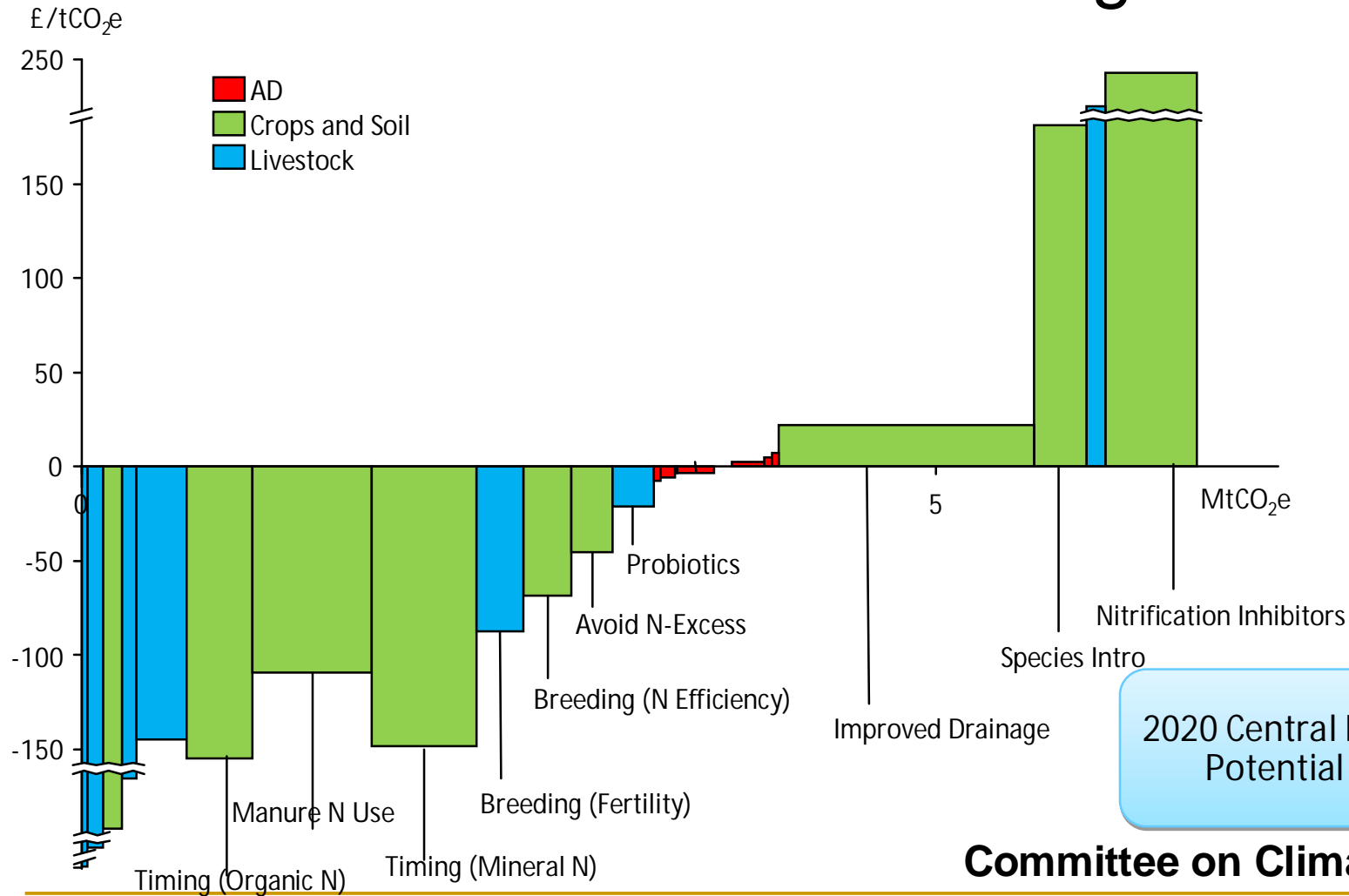
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# “Identification of the Knowledge Gaps” - Current Research Priorities

- **Timing** of mineral/organic Nitrogen applications
  - Use of **Nitrification Inhibitors/Slow Release** fertilisers
  - **Carbon storage**, Forestry, Soils & Soil Emissions  
(No till/min till; Organic Soils)
  - Manipulation of **Animal Diets** for Methane Reduction
  - Understanding the **Economics of reducing GHGs**
  - Improving **National GHG inventory & Carbon Calculators**
  - **Perverse Outcomes** due to interconnectivity of Sector
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# Agriculture Marginal Abatement Cost Curve

## Benefits & Costs of reducing GHGs



**Committee on Climate Change**

# The Role of Genetics in Reducing GHGs



**ACRBC 1957 Males – 2001 Feed**



**Ross 2001 Males – 2001 Feed**



**Day 43**

**Day 57**

**Day 71**

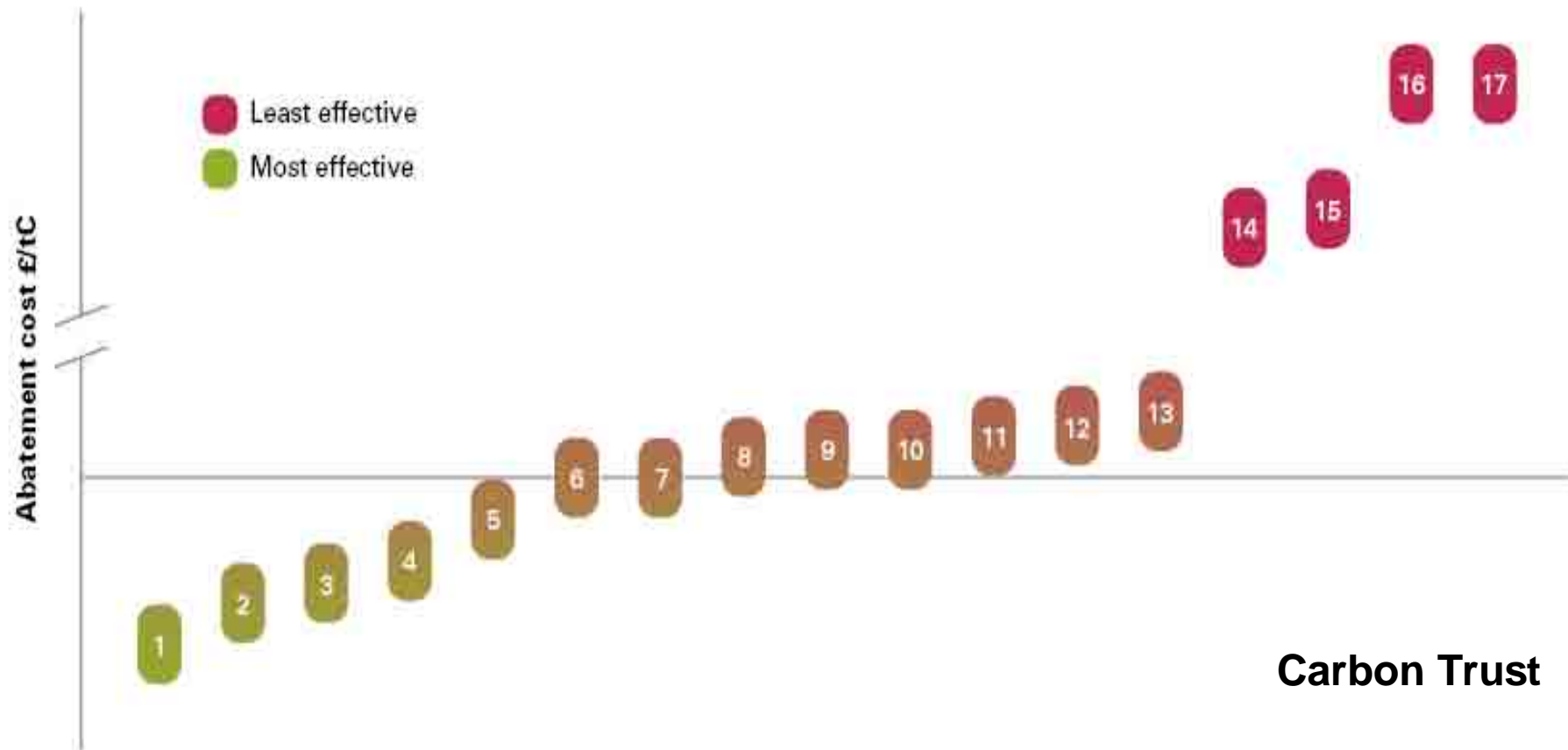
**Day 85**

Havenstein, et al 2003 - NCSU

**Since 1988 – Poultry 26%, Pigs 20%, Dairy Cows 8%, Cattle & Sheep 0%**

# Role of Renewables & Efficiency in GHGs

Figure 1 Indicative relative carbon abatement costs for a range of energy efficiency and renewable energy technologies<sup>5</sup>



- |                                           |                           |                                 |                         |
|-------------------------------------------|---------------------------|---------------------------------|-------------------------|
| 1. Energy Management Systems and Monitors | 5. Most efficient boilers | 10. Co-firing biomass with coal | 15. Solar water heating |
| 2. Building Fabric Insulation             | 6. Small Hydro            | 11. Small Wind                  | 16. GSHP                |
| 3. Heating Controls                       | 7. Small Biomass Heat     | 12. Large Biomass CHP           | 17. Solar PV            |
| 4. Low Energy Lighting                    | 8. Large Wind             | 13. AD CHP                      |                         |
|                                           | 9. V. Small Biomass Heat  | 14. Micro wind                  |                         |

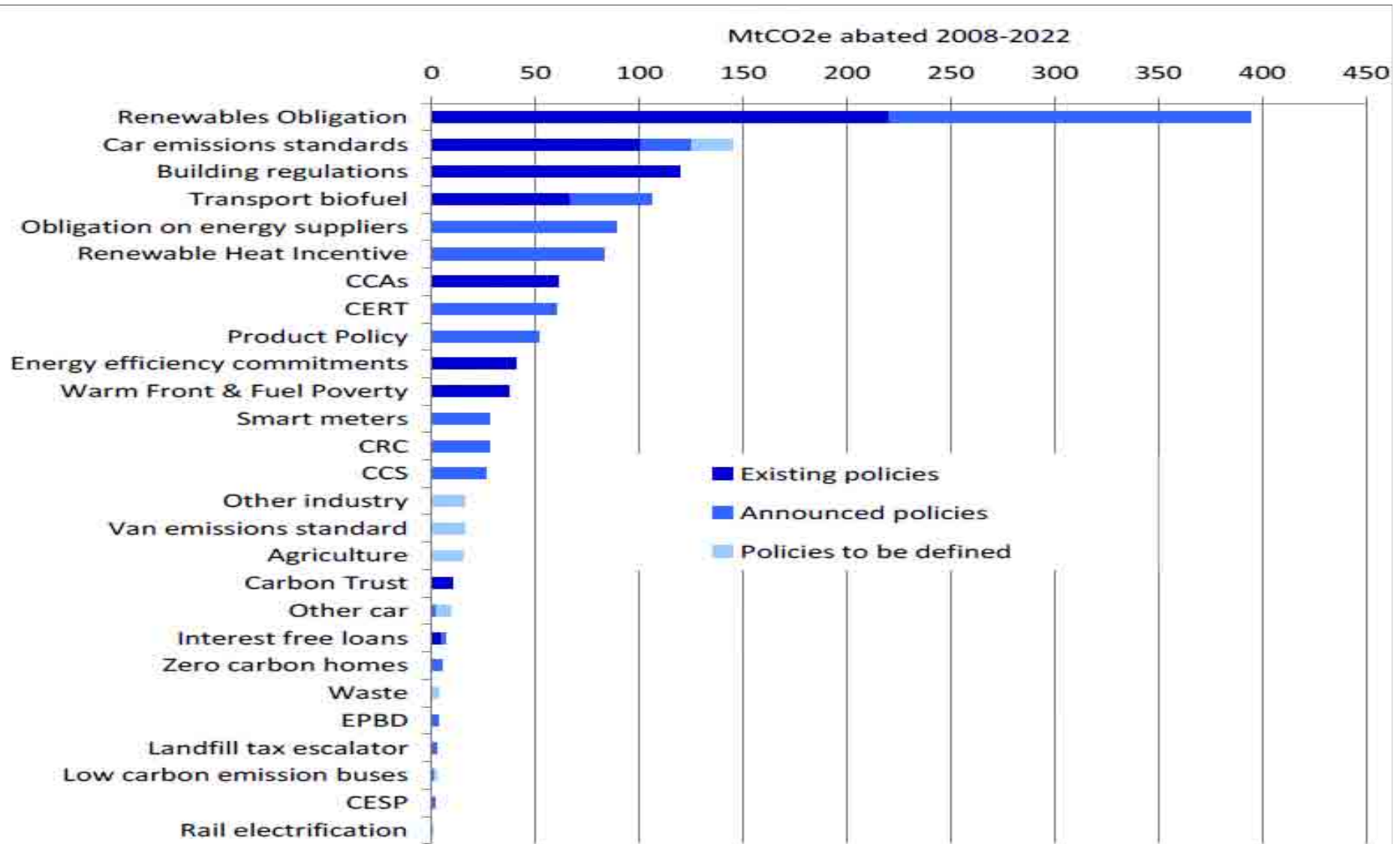
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## New Policies

# The UK & Scottish “Climate Change Acts”

- The **first** in the **World** & “**Cross Party**” supported.
  - **Compulsory Targets** to reduce GHG emissions by **80%** by 2050, against the 1990 baseline.
  - **Committee on Climate Change** set up to oversee & advise Government (Chair – Lord Adair Turner)
  - Includes **all GHGs** (methane & nitrous oxide) & **all Sectors** of the Economy
  - Includes ability to extend **Emissions Trading** through Secondary Legislation
  - **34%** Reduction, **UK Target**, without Copenhagen Deal  
**42%** Reduction, **Scottish Target**
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# Agriculture, Forestry & Landuse, in “Context”



# New Market Place Developments

## Walkers Crisps – Carbon Footprint Label

“A 35gram bag has 75grams of CO2”



# Product Life Cycle Analysis Becoming the Norm & at Unprecedented Rate

	UK Beef	UK Lamb	Pork	Chicken	Potato
<b>t of CO<sub>2</sub>e/t Product</b>	<b>13.9</b>	<b>14.6</b>	<b>4.0</b>	<b>2.7</b>	<b>0.15</b>
<b>Primary Energy use, GJ/t</b>	<b>31.3</b>	<b>22</b>	<b>23.3</b>	<b>16.9</b>	<b>1.4</b>

**EBLEX**

**But - Be wary of Perverse Outcomes from using First Generation, Carbon Calculators – No Sequestration!!**

# **First Generation Carbon Calculators**

## **Food Chain, Carbon Accounting – PAS 2050 Standard**

- Facilitated by UK Government & British Standards Inst.
- Supported by Food Industry (Ass. British Agric.; British Sugar; Cadbury; Co-op; Innocent; Muller; Pepsico; Tesco)
- Indirect Landuse Change Consequences & On farm Seq.?

## **Carbon Accounting for Land Managers (CALM Calculator)**

- Developed by CLA, Savills & East of England Dev. Agency
- Free Web Based Calculator for complete Rural Business
- Recognises On Farm Sequestration, as well as Emissions

**Need Hybrid! – Accredited but Recognising Sequestration!**

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## **But, be wary of the Perverse Outcomes - Livestock Destocking!!**

- **Ruminant Livestock** production is **Grass Based**
  - **Permanent Grass** is an excellent “**Carbon Sink,**” and very good for **Biodiversity**
  - Uncontrolled **Ploughing** of permanent grass will lead to **excessive GHG Emissions & reduction in Biodiversity**
  - **Forced Destocking** of livestock, without behavioural **change in Consumption** will lead to the **exporting of GHG Emissions** created by this Food Consumption
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## Projected Job Creation in EU Renewables, if 20% EU Target to be met by 2020 - mostly in Agric!

	Jobs	Jobs	Jobs	Jobs per MW
	EU27	UK	NI	
Offshore wind	154,180	251,280	1,400	10
Onshore wind	144,550	209,400	8,360	6
Tide & wave	19,270	41,880	2,790	10
Solar thermal	280,000	5,600	640	23
PV	245,000			34
Hydro	28,000	8,360	560	20
Geothermal	10,000			10
Bio-waste	264,000	13,960	830	20
Solid Biomass	264,000	19,540	1,230	22
Bio-gas	614,000	13,960	340	8
<b>Total RES jobs</b>	<b>2,023,000</b>	<b>564,000</b>	<b>16,150</b>	

Source: Renewable Energy Supply Chain in Northern Ireland, June 2008

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# **GHGs, Food Security & The Market Place**

- **Farming & the Agrifood Industry must Engage!!**
  - **Focusing on Climate Change alone, leads to Perverse Outcomes**
  - **Not an exact science & questions still to be answered**
  - **Further Investment in R&D Essential, if we are to both feed the World and alleviate Climate Change**  
eg. Global Agriculture Research Alliance
  - **The Media, Retailers' & Consumers' knowledge limited.**  
They must be **Engaged & Educated**, otherwise the **Ruminant Sector especially, will be the Loser!!!**
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