Climate Change Policy – A UK perspective

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The problem and the case for action

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There is consensus in the UK on the central scientific findings of global warming – a problem that requires urgent action

- **Global warming is real**: average surface temperature has increased by 0.74°C over the last hundred years, a rate and scale likely to have been greater than at any time in at least the past 1000 years.
- **Global warming is man-made**: most of the warming over the last 50 years is attributable to greenhouse gases from human activities.

2°C

Even if mitigation was sufficient to contain annual emissions at today's level, the world is likely to experience a 2°C warming above pre-industrial levels by 2050

The risk of serious human impacts increases strongly without mitigation

There will be an increasing severity in the number of people dying from hunger, water shortages, heat-related stress and malaria

5°C is the difference between temperatures now and the last ice age

5°C

Without significant mitigation, on business as usual trends, there will be a 50:50 chance of exceeding a 5°C temperature increase by the end of the 21st Century

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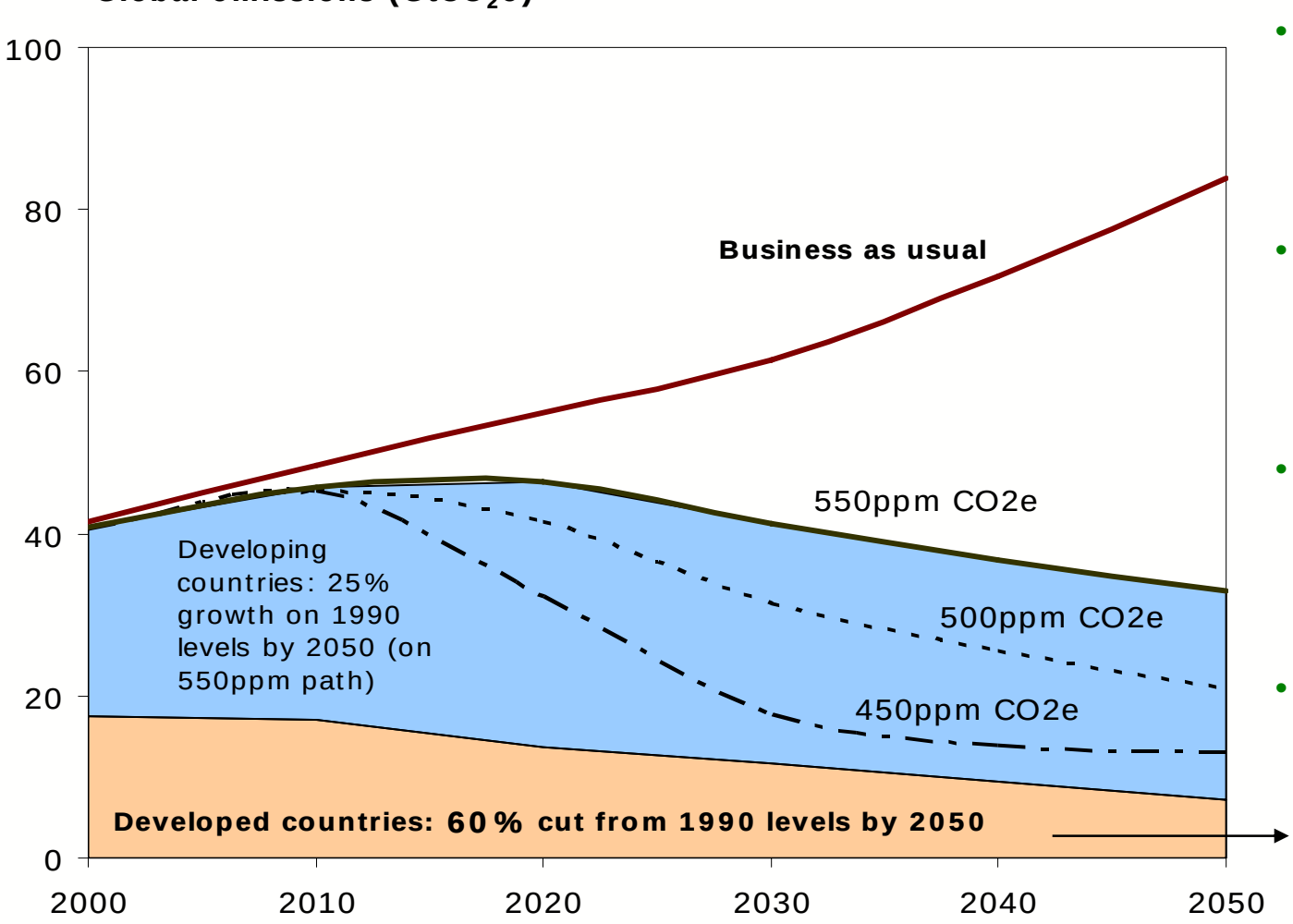
IPCC Fourth Assessment Report (2007). Stern Review (2006).

The challenge is to stabilise global greenhouse gas concentrations to avoid the worst of these climate change risks



- The Stern Review recommends a stabilisation goal of no more than 550ppm CO_2e
- To achieve this would require that global emissions peak in the next 10-20 years
- Delaying the peak in emissions by 10 years would double the rate of reduction required
- **The UK target of a 60% CO_2 reduction by 2050 is consistent with the Stern goal**

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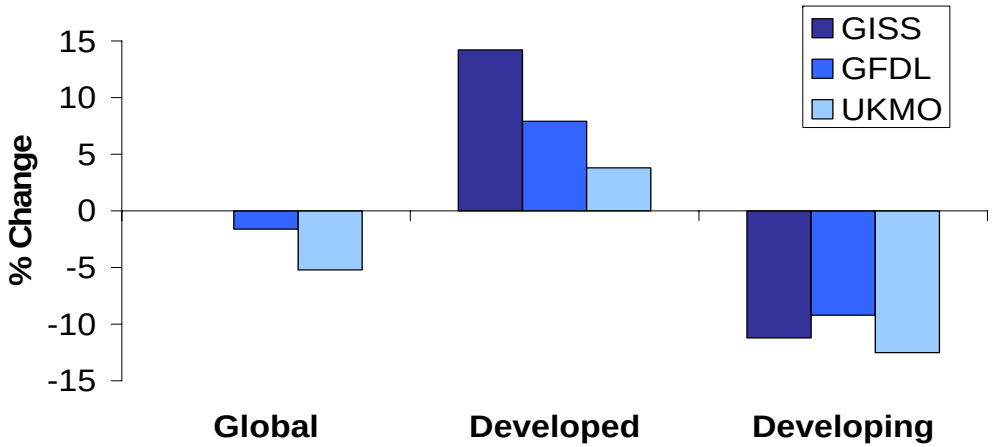
Stern Review (2006); 'ppm' = parts per million concentrations in the atmosphere.

The poorest countries and people will suffer the most

- Many developing countries are likely to be particularly vulnerable to the impacts of climate change, due to their geography, their dependence on agriculture, and/or their lower incomes and access to resources.

- Poorest people in richer countries are vulnerable as they are most likely to live in marginal lands, have fewer financial resources to adapt to climate change (e.g. insurance), and are least likely to be aware of the risk of a severe weather event.

Change in cereal production in developed and developing countries for 3°C warming



Agriculture in higher-latitude developed countries is likely to benefit from moderate warming (2-3 °C), but even small amounts of climate change in tropical regions will lead to declines in yield.

Changes in cereal production for a doubling of carbon dioxide levels (roughly equivalent to 3°C in the models used)

The key relates to the three simulation models used

Source: Stern Review

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Stern Review (2006)

The costs of stabilising the climate are manageable – delay would be dangerous and much more costly

1% GDP

Costs of mitigation to stabilise emissions at 550ppm by 2050

vs

5% GDP

Income losses if we do nothing: market impacts only

20% GDP

Income loss including non-market impacts, risk and equity

- Delay is a dangerous option because damages from climate change rise disproportionately with temperature.
  - For example, a 25% increase in storm wind speeds is associated with an almost 7-fold increase in damages to buildings.
- Adaptation is crucial for responding to unavoidable climate change but there are limits to how much it is possible to adapt to the worst effects.
  - For example, climate change could lead to floods, massive population shifts, and wars over natural resources; it would be very difficult to adapt to these changes. Also, ecosystems are unlikely to be able to adapt at the rapid rates of change expected.

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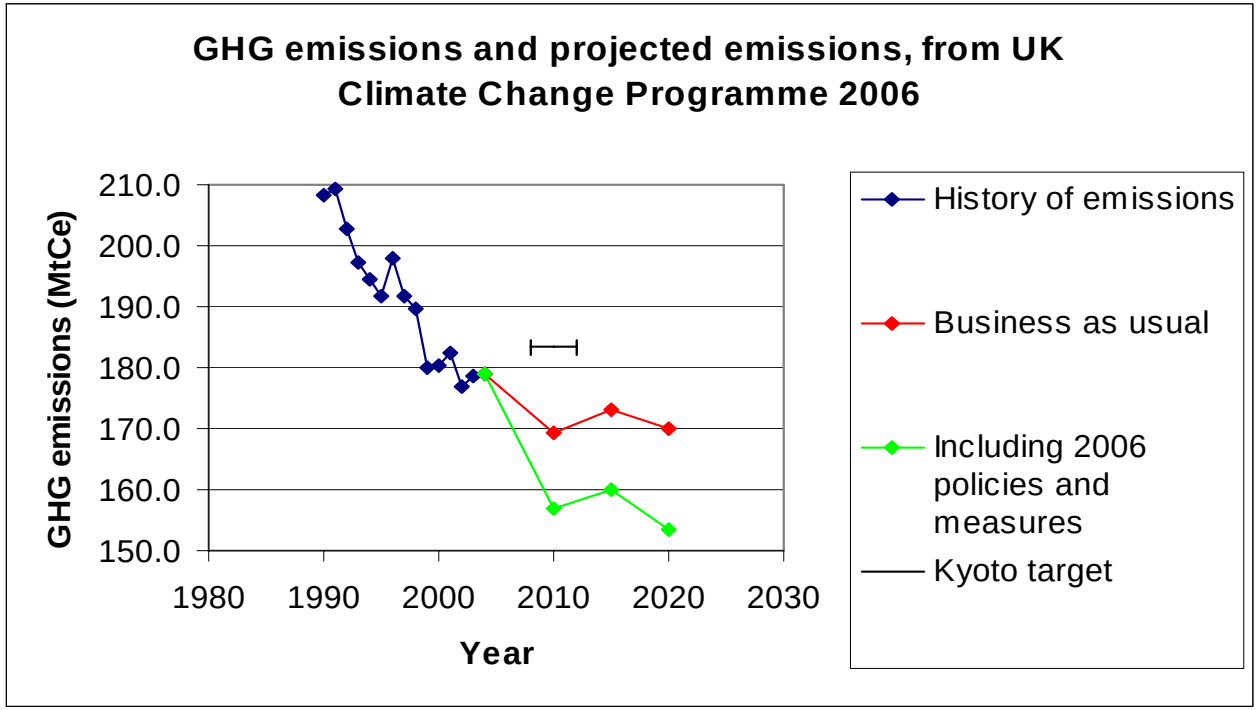
Stern Review (2006)

UK Progress on tackling climate change

UK Progress against Kyoto target



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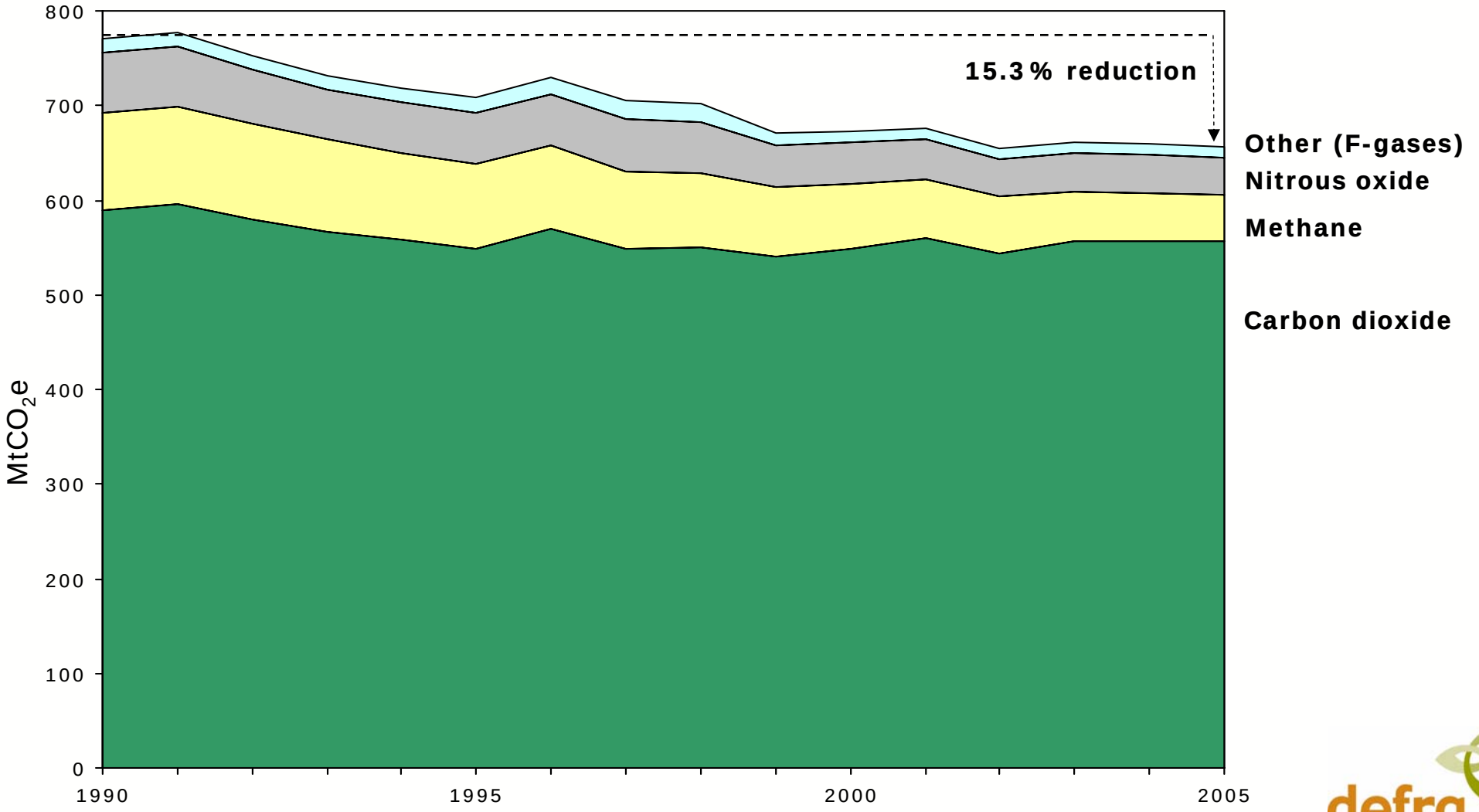
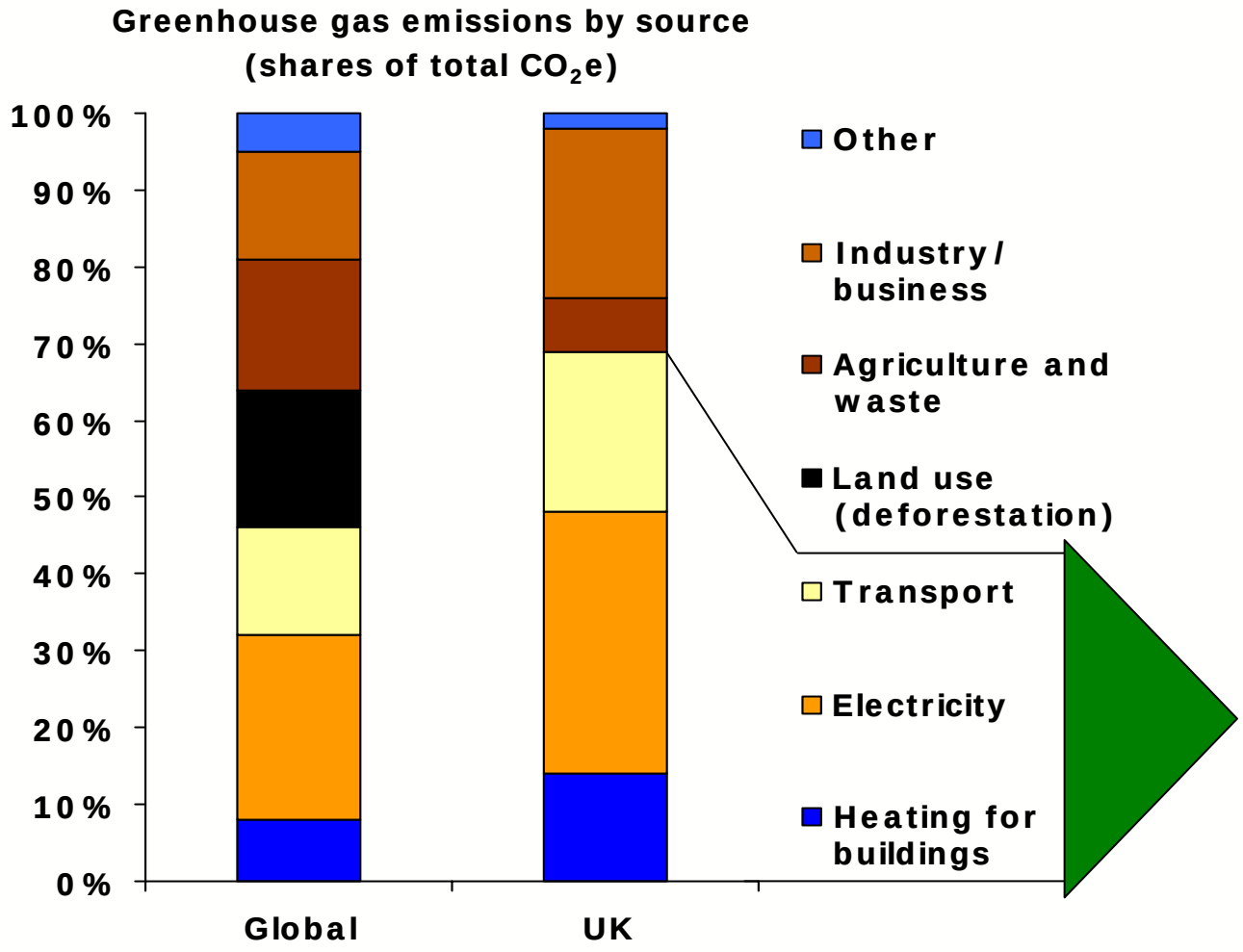
Progress in tackling greenhouse gas emissions in the UK



Defra Statistical Press Release (31 January 2007), *2005 UK climate change sustainable development indicator and greenhouse gas emissions final figures*

Decarbonising our largest sources of emissions requires significant further effort



In the UK

Emissions from electricity generation, buildings (heating) and transport account for around 70% of all greenhouse gas emissions (largely CO_2)

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Global: Stern Review (2006). UK: Fourth National Communication (2006). Different compilation methodologies mean that the global/UK sector comparisons are illustrative but not exact. UK land use has negative emissions.

2000 Climate Change Programme and early action on climate change

- UK Voluntary Emissions Trading Programme
- Climate Change Levy
- Climate Change Agreements
- EU Emissions Trading Phase I

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UK Voluntary Emissions Trading Program 2002 – 2006

- 6 greenhouse gases
- Purpose – learning by doing
    - Emissions reductions
    - Help City of London to become a centre for Carbon Trading
- Descending Clock Auction
- Met 5 year target in 1st year
- Toughened targets

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UK Emissions Trading Scheme

- 33 participants committed to reduce emissions by 3.96 mtCO2e by the end of the scheme,
  - received Government incentive money for meeting their annual targets

- So far UK ETS has delivered emissions reductions of over 15.9 mtCO2e. This includes an extra 8.9mtCO2e, pledged by 6 leading particpants in 2004, through tighter targets.
  - 2006 figures not yet finalised.

- Enabled “learning by doing” for both participants and Government ahead of international emissions trading

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Climate Change Levy

- Introduced in 2001
- Energy tax applied to industry, commerce, agriculture, and the public sector
- Adds about 10-15% to fuel bills
- Exemptions for renewable sources and CHP
- Most companies could save the cost of the Levy by simple better management, without investment in energy saving technology

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Climate Change Levy – "Revenue Neutral"

Revenues from the Levy are returned to industry through

- a 0.3% reduction in the rate of employer's National Insurance Contributions
- funding of the Carbon Trust (a public benefit fund)
- reductions for CCAs and exemptions for CHP and renewable energy sources

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Climate Change Agreements

- Energy efficiency agreements
- 80% discount on Levy for meeting targets
- Duration: 2001 to 2013
- Projected carbon savings of 2.5MtC by 2010
- ***Ten times the estimated price effect of the Levy alone***
- Actual savings

- 2002 – target - performance 13.5 $MtCO_2$
- 2004 – target - performance 14.4 $MtCO_2$

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European Union Emissions Trading Programme

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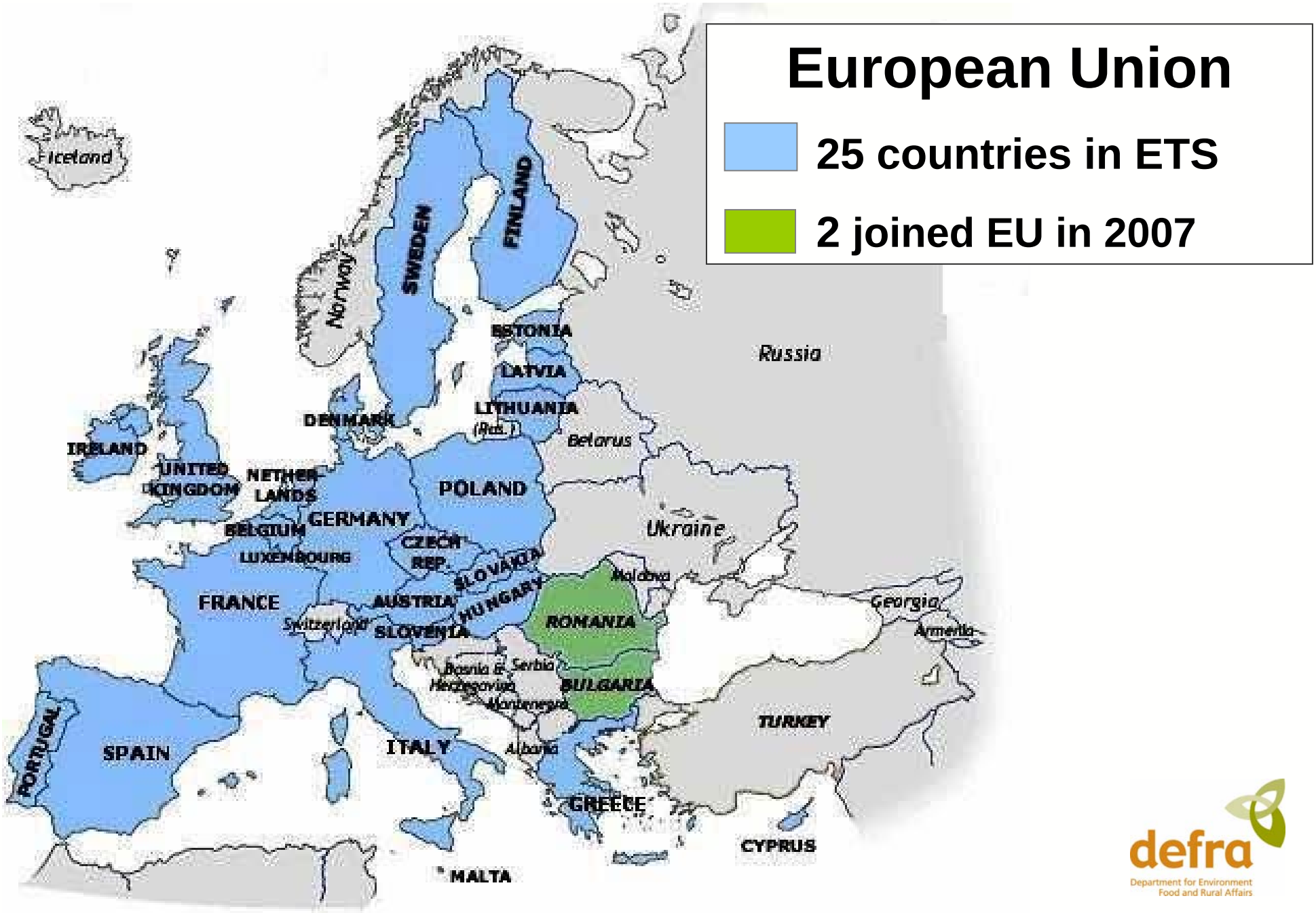
European Union
25 countries in ETS
2 joined EU in 2007
Iceland
Norway
SWEDEN
FINLAND
ESTONIA
LATVIA
LITHUANIA
(Rus.)
Russia
Belarus
DENMARK
IRELAND
UNITED KINGDOM
NETHER-LANDS
POLAND
GERMANY
BELGIUM
LUXEMBOURG
CZECH REP.
SLOVAKIA
HUNGARY
Ukraine
Moldova
FRANCE
AUSTRIA
Switzerland
SLOVENIA
ROMANIA
Georgia
Armenia
Bosnia & Herzegovina
Serbia
Montenegro
BULGARIA
TURKEY
PORTUGAL
SPAIN
ITALY
Albania
GREECE
CYPRUS
MALTA
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European Union action: Emissions Trading Scheme (ETS)

- **1998**: EU Member States **agree share-out of EU 8%** Kyoto target.
  - EG -20% (Germany, Denmark), -12.5% (UK),
- **2001**: Legislation for ETS proposed; Member States (Council) + European Parliament reach agreement in **2003**.
- Why emissions trading ?
  - Least cost emissions reductions
  - certainty of environmental impact - through cap on emissions
- New approach to environmental legislation to meet **global** challenge of climate change.

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Key features of EU ETS

- "Cap and trade" scheme covering CO_2 emissions from combustion processes (approx 50% of EU CO_2 emissions)
- 1 European Union Allowance (EUA) = 1 metric tonne of CO_2
- Allowances freely tradable throughout EU Member States
- Majority of allowances allocated for free - range of methods, including historical emissions, projected emissions, sector benchmarks etc
- limited use of offsets (Kyoto project credits)

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Phase I – 2005 – 2007 – the learning phase

- 25 Member States
- Rushed timetable
- Institutions in place
- Trading begins
- Results of first year released May 2006

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Phase II – 2008 -2012
First Kyoto Commitment Period

- 27 Member States
- Rushed timetable
- Real data to assess allocations
- Commitment to scarcity
- Limits on the use of offsets (CDM/JI)
- Action on small installations
- Management of market sensitive information
- But … no change to the Directive

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Comparison UK Phase I vs Phase II (1)

Phase I, year 1 emissions (2005)	EU ETS	242.2 $MtCO_2$
	Estimate for opt-outs	~30 $MtCO_2$
	Total	~272 $MtCO_2$
Phase I cap		245 $MtCO_2$
Phase II cap	Incumbents (including opt-outs)	237 $MtCO_2$
	Expansion	9.5 $MtCO_2$
	Total	**246 $MtCO_2$**

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Comparison UK Plan Phase I vs Phase II (2)

- The comparable Phase II cap:
  - represents around a 3% reduction on the Phase I cap
  - 13% below the *estimate* of emissions in 2005 (this estimate includes emissions from opt-outs)
  - 14% below EU ETS emissions in 2003
  - 11% (29MtCO_2) lower than BAU projection (the Phase I cap was set 8% below BAU projection)
  - puts UK on track to a 16.2% reduction in carbon dioxide emissions by 2010

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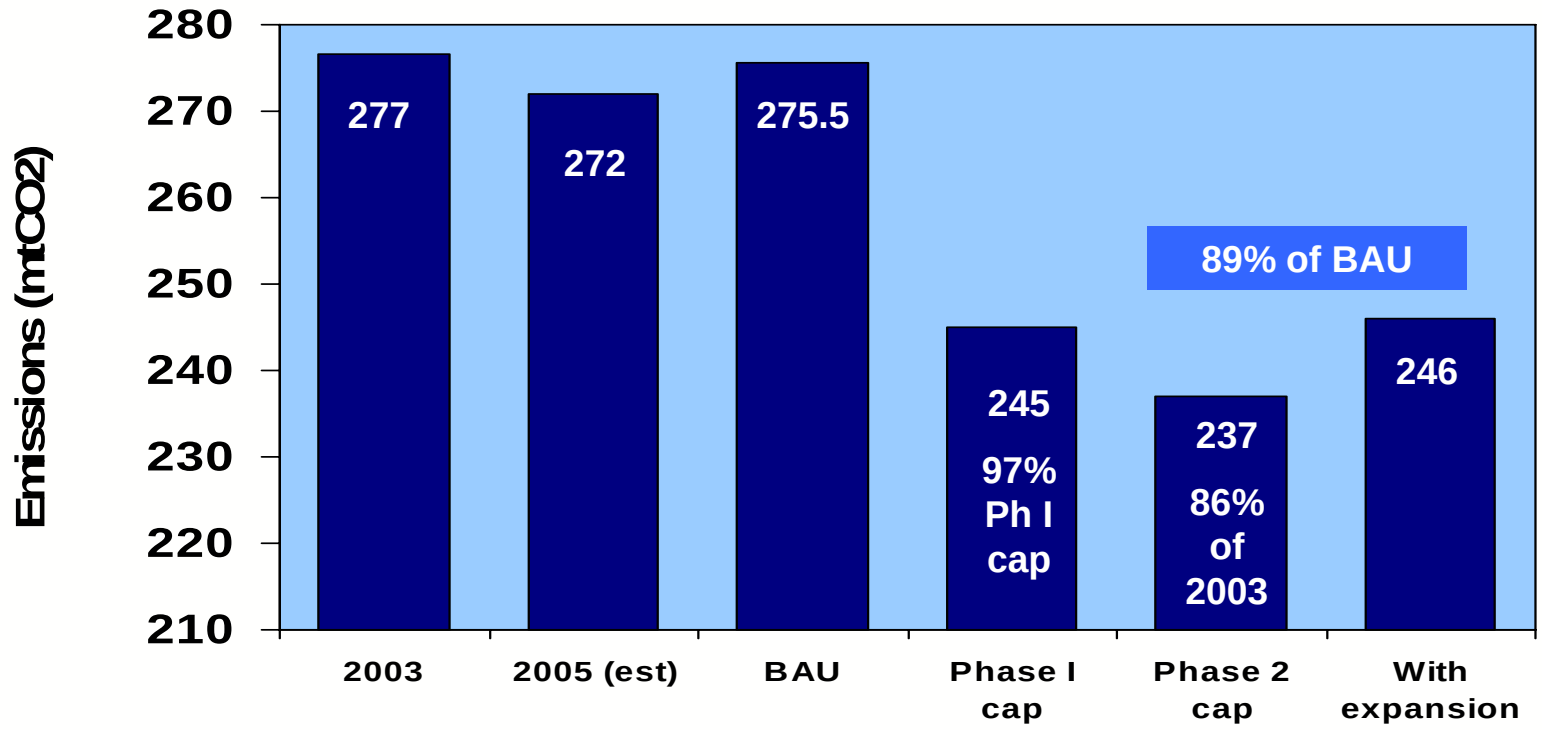
Total Quantity of Allowances



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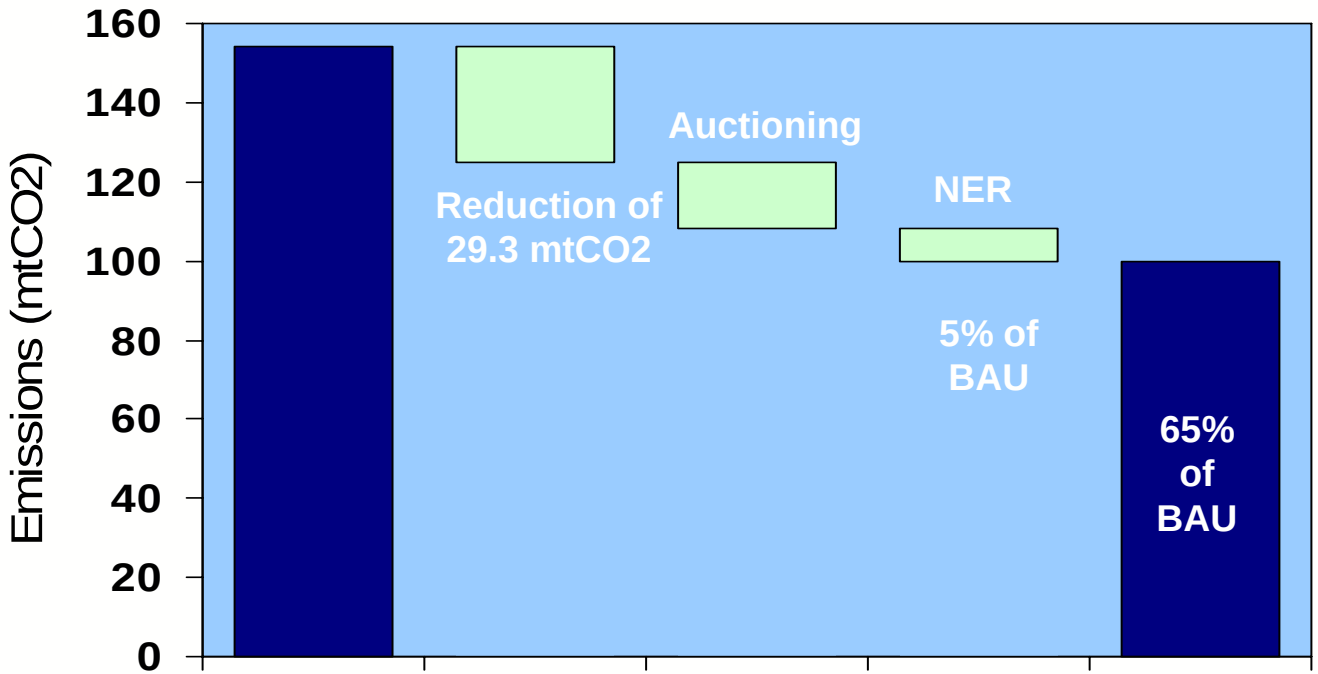
Allocation to Large Electricity Producers



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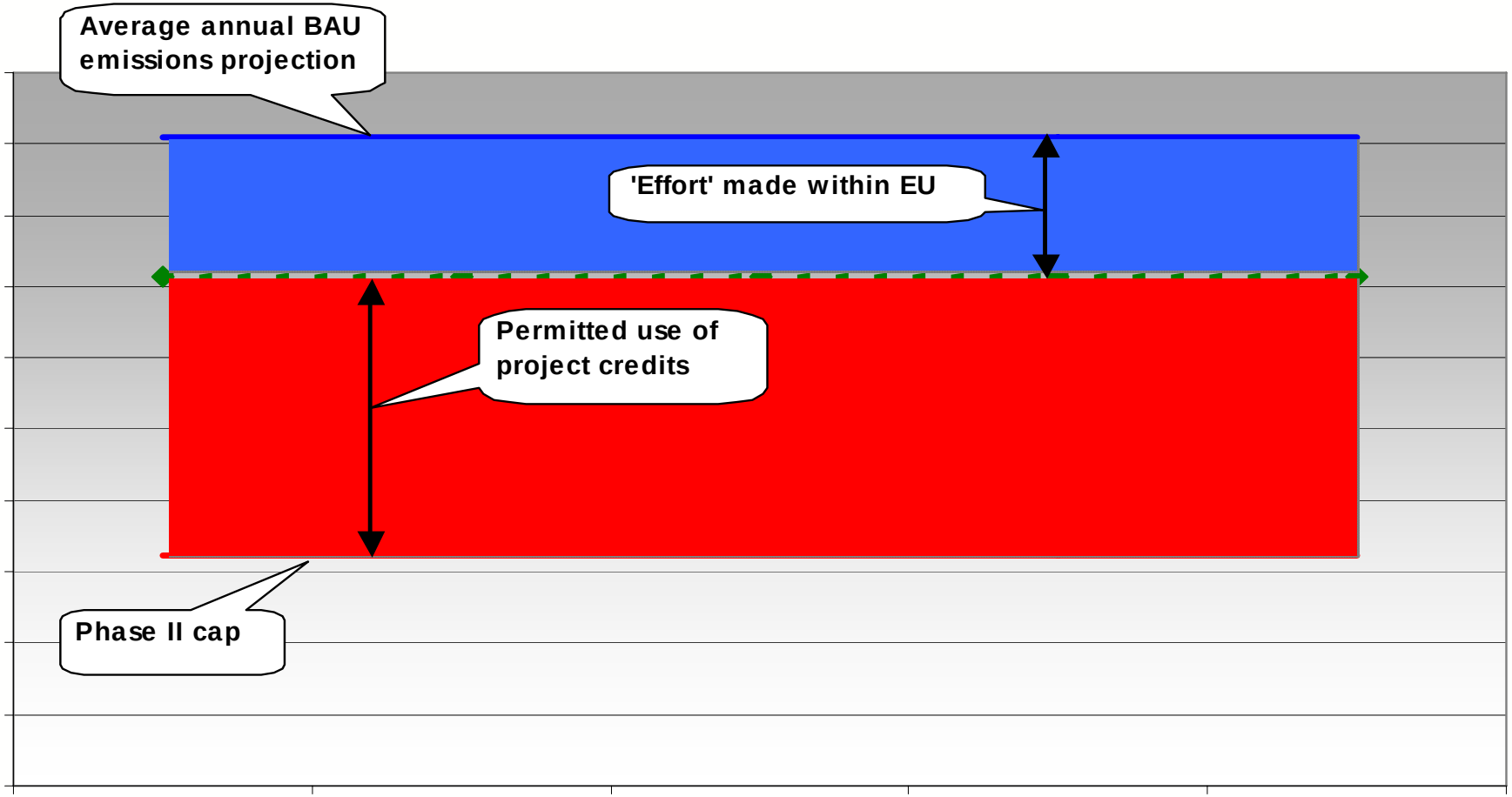
Use of offsets (project credits) in phase II



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What’s happened so far?

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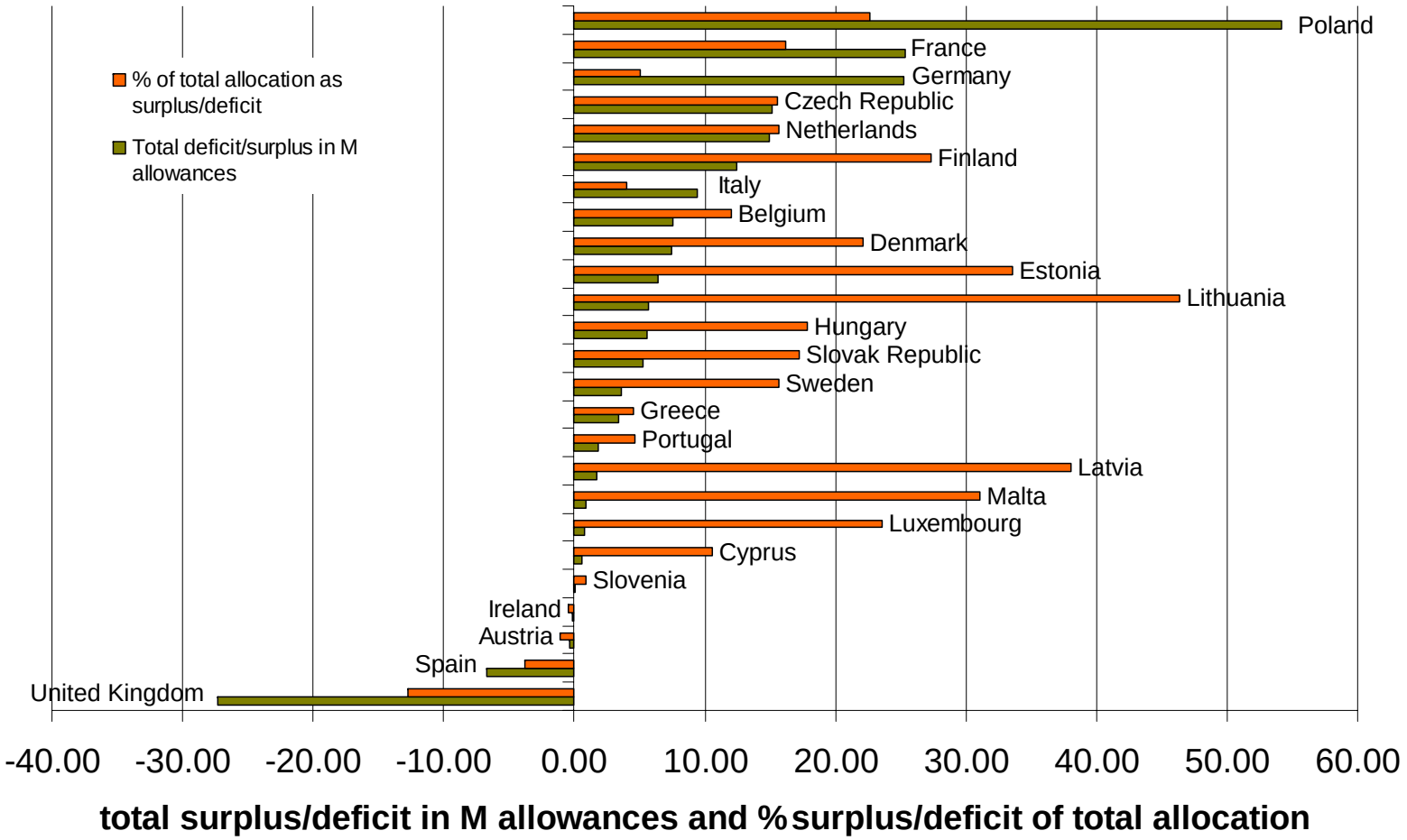

total surplus/deficit in M allowances and % surplus/deficit of total allocation

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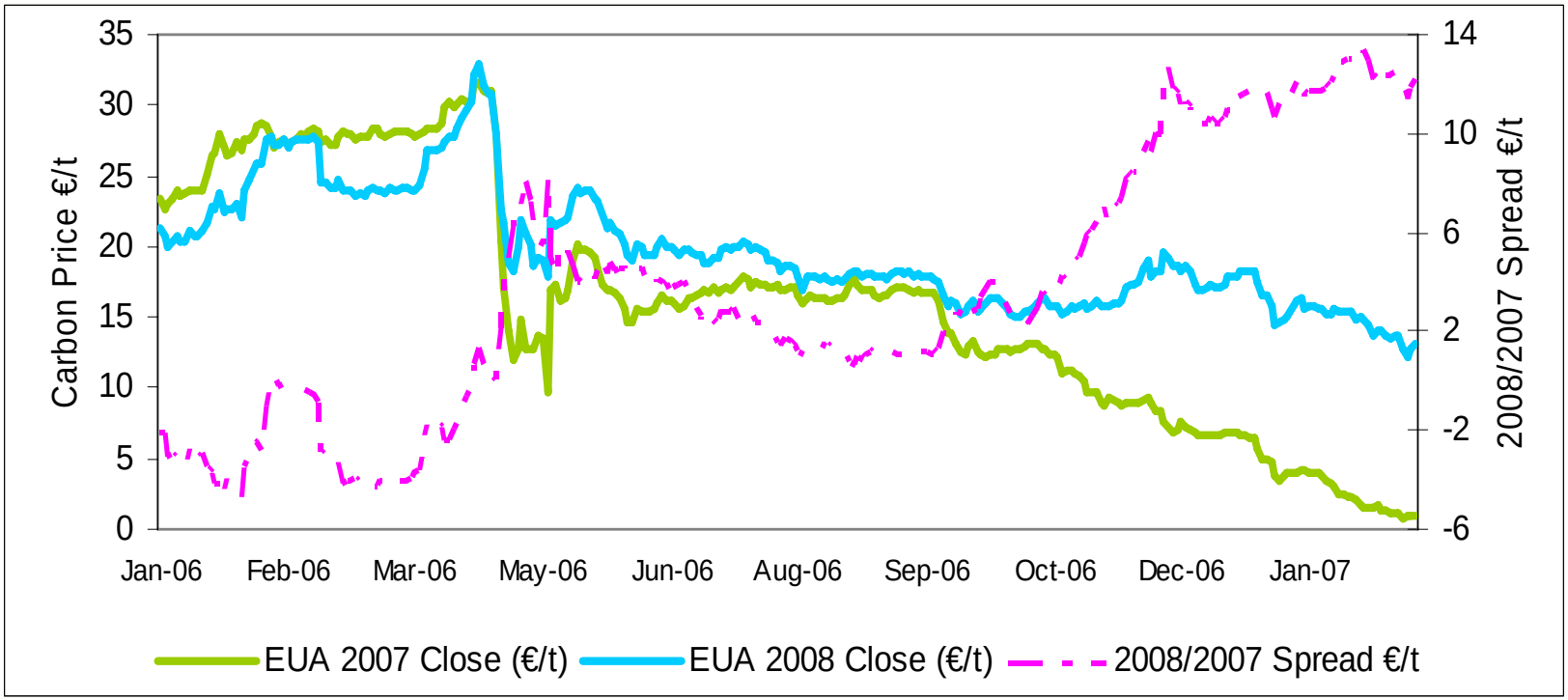
EU allowance prices:
phase 1 (2005-07) and phase 2 (2008-2012)



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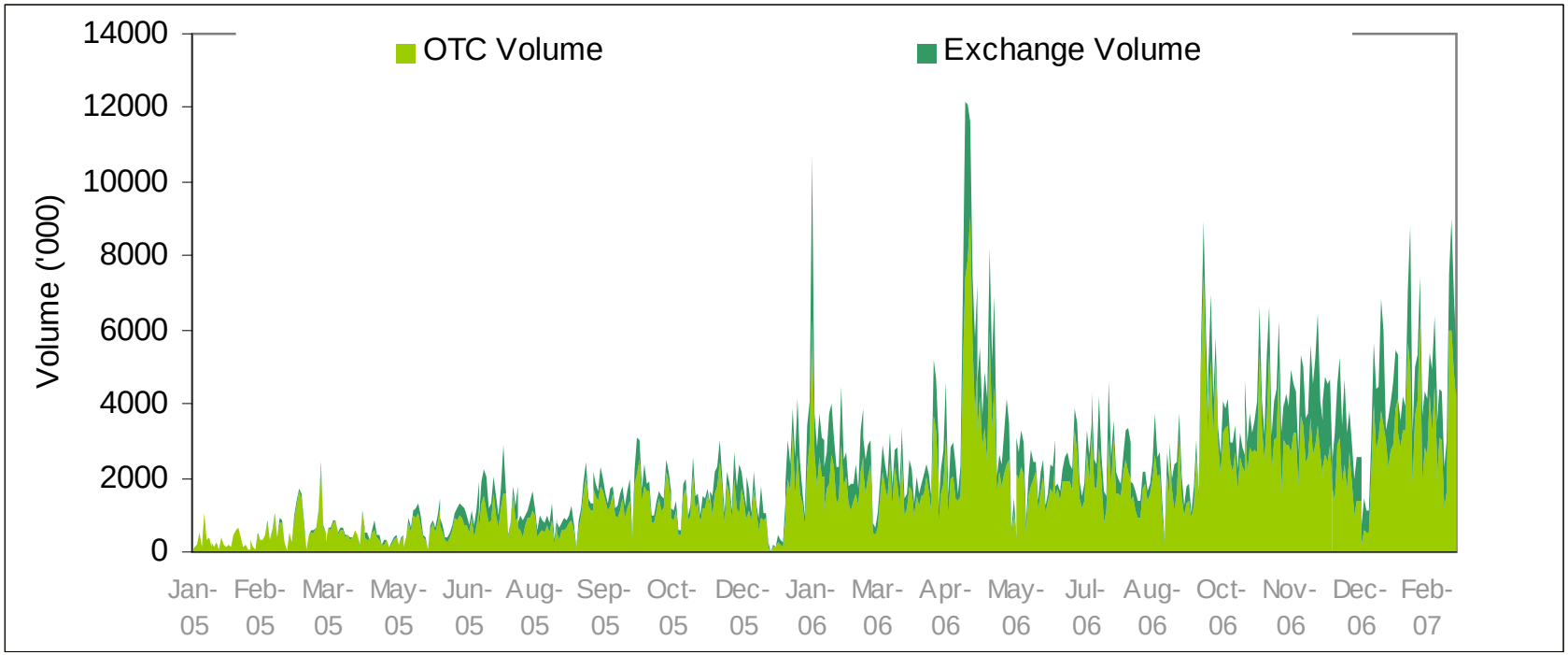
EU emissions trading:
Daily Volume Jan 05 – Feb 07



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Member State	Phase I cap mtCO2	2005 verified emissions	Proposed cap 2008-2012	Allowed cap 2008-2012*
Belgium	62.08	55.58	63.33	58.5
Germany	499	474	482	453.1
Greece	74.4	71.3	75.5	69.1
Ireland	22.3	22.4	22.6	21.15
Latvia	4.6	2.9	7.7	3.3
Lithuania	12.3	6.6	16.6	8.8
Luxembourg	3.4	2.6	3.95	2.7
Malta	2.9	1.98	2.96	2.1
Netherlands	95.3	80.35*	90.4	85.8
Slovakia	30.5	25.2	41.3	30.9
Sweden	22.9	19.3	25.2	22.8
UK	245.3	272*	246.2	246.2

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Wholesale Electricity prices

Price rises of 70% in UK in 2005 (US 27%)

- Mostly due to gas price rises (65% in 2005 and 73% in 2006)
- in turn due to oil price rises (contractually linked)

25-30% of the rise in wholesale electricity due to ETS

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Early successes

- Functioning market was created against ambitious timetable, high level of compliance in year 1 (99%+)
- Early evidence of behavioural impacts, much higher level of boardroom attention

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What have we learned

- Industry needs certainty – fixed future targets
- Markets need scarcity
- Scarcity needs good baseline data
- Impacts on Environment – firms tend to respond – even when its not rational to do so!
- Lack of harmonisation between states creates real and perceived competitive distortions

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Competition – have participants closed shop and moved to China

- Programme only running 2 years
- Not all sectors subject to international competition
  - Iron and steel - yes
  - Electricity generation – no
- Some sectors can pass through costs
- Carbon Price only one of a number of factors
  - Proximity to markets
  - Transportation costs
  - Skilled labour force

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Latest developments

- Climate Change Programme
- Stern Review
- Energy White Paper
- Climate Change Bill
- European Union Spring Council Conclusions
- The Review of the ETS Directive

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Climate Change Programme 2006

Existing measures	Carbon savings in 2010 (MtC)
Energy supply	
Renewables Obligation	2.5
Business	
Climate change levy[1]	*3.7*
UK emissions trading scheme	0.3
Carbon Trust	1.1
Building Regulations 2002	0.4
Building Regulations 2005	0.2
Climate change agreements	2.9
Transport	
Voluntary Agreements package, including reform of company car taxation and graduated VED	2.3
Wider transport measures[2]	0.8
Sustainable distribution in Scotland and Wales	0.1
Fuel duty escalator	1.9
Domestic	
Energy Efficiency Commitment (EEC) (2002-05)	0.4
Energy Efficiency Commitment (EEC) (2005-08)	0.6
Energy Efficiency Commitment (EEC) (2008-11)	0.6
Building Regulations 2002	0.7
Building Regulations 2006 including 2005 condensing boilers update	0.8
Warm Front and fuel poverty programmes	0.4
Market Transformation including appliance standards and labelling	0.2
Agriculture	
Woodlands Grants Scheme (England)	0.2
Woodland planting since 1990 (Scotland)	0.5
Public Sector	
Central Government, NHS, UK universities and English schools including Carbon Trust activities	0.2
TOTAL	**17.1**[3]

1 An independent evaluation by Cambridge Econometrics (CE) concluded that CCL would deliver annual carbon savings of 3.7MtC by 2010, from an announcement effect and price effect of the levy. This figure assumes CCL rates are increased in line with inflation from 2006 to 2010. The impact of CCL in the projections is incorporated through the price elasticity of demand for different fuels ('the price effect'), and there is no separately identified announcement effect within the UEP baseline.

2 As set out in 'Transport 2010: The 10 Year Plan for Transport' and built upon in 'The Future of Transport: A network for 2030'.

3 Total does not include carbon savings from climate change levy, and may differ slightly from figures for total carbon savings shown in Chapters 3 to 8 due to rounding.

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Stern Review: “The economics of climate change”

- **October 2006: Stern Report published**
- **Key messages:**
  - **Urgency** - benefits of strong early action outweigh costs of inaction
  - **Mitigation = investment**
  - Poorest countries and people will suffer **earliest** and **most**
  - Growth v. tackling climate change is a **false choice**
  - **Prices** need to reflect climate change impacts –through taxes, regulation, or trading. **Trading** likely to be the best way of securing an international carbon price.

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Energy White Paper

TABLE 8.1: CARBON IMPACT OF GOVERNMENT MEASURES ANNOUNCED SINCE THE 2006 CLIMATE CHANGE PROGRAMME REVIEW (EXCEPT WHERE DENOTED†)

	MtC abated in 2020
Better Billing	0 – 0.1
Changes to the Renewables Obligation[1]	0.7 – 1.5
EU Emissions Trading Scheme[2]	8
More energy efficient products[3]	2
Nuclear new build[4]	0 – 1.1
Renewable Transport Fuel Obligation	0.3 – 1.1
New measure for achieving carbon savings from large non-energy intensive organisations	1.2
Successor to EU voluntary agreements on new car fuel efficiency[5]	1.8 – 2.1
Continued commitment on energy suppliers to 2020[6]	3.0 – 4.0
†Continuation of building regulations 2005[7]	2.5 – 3.0
Carbon neutral government[8]	0 – 0.8
Carbon neutral developments[9]	0 – 0.4
Total	*19.5 – 25.3*

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The Climate Change Bill is designed to help us move to the kind of competitive low carbon economy required to meet the global challenge

Budgets

Long term statutory targets:
- 60% by 2050
- 26-32% by 2020

Five year carbon budgets to set out our trajectory

Committee on Climate Change

Independent body to advise Government on its carbon budgets and where savings could come from

Enabling Powers

Enabling powers to introduce new emissions trading schemes through secondary legislation

Reporting

The Committee on Climate Change will have a duty to report annually on progress to Parliament

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Spring EU Council Conclusions

- Reduce to **20% below 1990 levels by 2020**; and a 30% reduction in greenhouse gas emissions by 2020 compared to 1990 provided that other developed countries commit themselves to comparable emission reductions

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Review of the European Trading Directive

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Priorities for the EU ETS Review

- The Commission has set out four priorities for the Review

The Scope of the Directive

Feasibility of including N2O, Coal mine methane, expansion to aluminium sector, and others. Treatment of CCS, small installations. Approval of EU projects

Harmonisation and Predictability

Single EU cap vs national caps, sector specific allocation, use of projections, auctioning, benchmarking, new entrants and closures, reporting to markets

Compliance and Enforcement

Regulation of Monitoring and Reporting; community level verfication, further harmonisation

Linking to other Schemes

Design of 3rd Country Schemes
Recognition at regional level
Efficacy of JI and CDM
Community authorisation of projects
Harmonised limits on use of project credits

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