

# Ricardo-**AEA**

## **World Bank PMR – Technical Meeting on Carbon Tax**

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Ricardo - AEA is one of the world's leading energy and climate change consultancies, with over 220 climate change and sustainability experts, providing analysis and solutions for major environmental challenges worldwide.

We have worked at the heart of ground breaking technical and policy developments across the environmental spectrum for the last 40 years, and continue to play a lead role as advisor to governments, international institutions and major corporations.

- **Heritage**

- Air quality and clean air policy -1950's
- Energy efficiency and consequences of oil crisis -1970's
- Climate change and sustainability -1980's
- Resource efficiency and resource productivity- present



- **Domain expertise**

Climate change, energy, water management, resource productivity and security, air quality, waste and recycling, chemical risk and sustainable transport

- **Services**

Strategic consultancy, economic modelling, project leadership and data management

## Overview of UK Climate Change Levy (CCL)

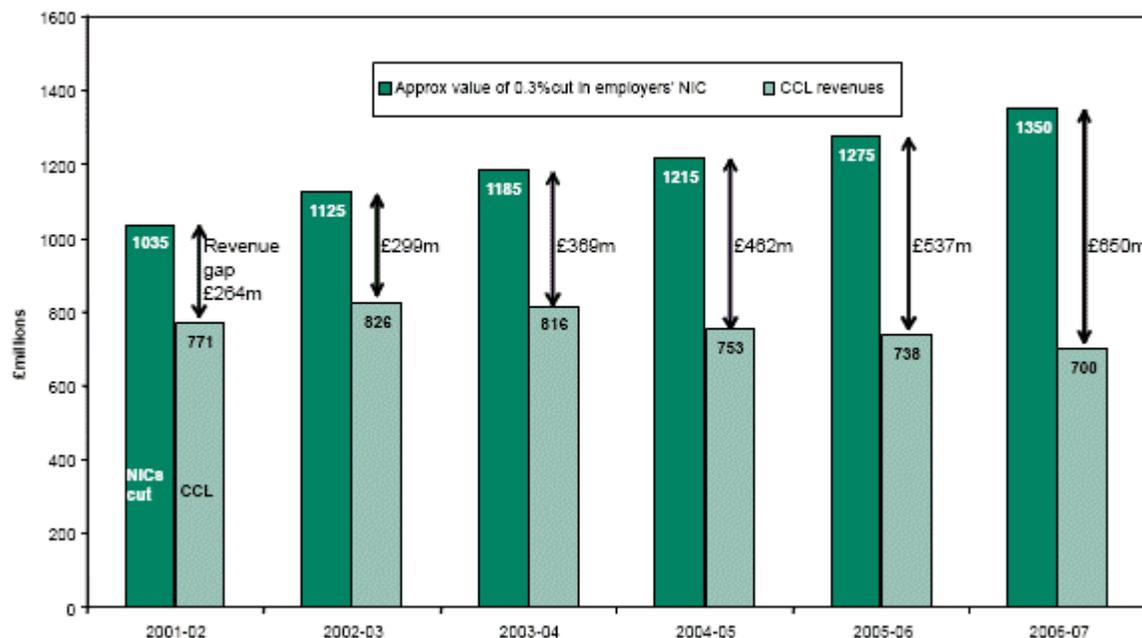
- A tax on energy use by business and public administration (electricity, gas, LPG and solid fuel), introduced 1 April 2001 and collected via energy suppliers. Two rates:
  1. **Main rate** – applies to all CCL participants except electricity generators and certain CHP operators.
    - √ aims to incentivise energy efficiency and reduce emissions
  2. **Carbon Price Support Rate**, introduced on 1 April 2014 – electricity generators and certain CHP operators (excludes Northern Ireland)
    - √ aims to provide an incentive to invest in low-carbon power generation by providing greater support and carbon price certainty in the UK
- Exemptions: electricity generated from renewables, domestic energy users, charities, businesses who consume very small quantities of energy, road fuels and other oils.

Commodity	Main rate
Electricity	0.541 pence per kilowatt hour
Gas	0.188 pence per kilowatt hour
Any petroleum gas, or other gaseous hydrocarbon, supplied in a liquid state	1.210 pence per kilogram
Any other taxable commodity	1.476 pence per kilogram

## How carbon tax revenues can be used – UK Climate Change Levy

- Original intention was for all CCL revenues to be recycled back to business, with the aim of further incentivising emissions reductions by:
  - offsetting a 0.3% employers' rate reduction in national insurance payments
    - In practice, offsetting wasn't exactly revenue-neutral at a government-level (see below), or organisation-level.

Figure 2 CCL revenue vs 2001 cut in employers' NICs



→ Later reversed, when employers' rate was increased by 1%

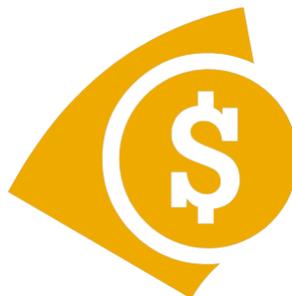
## How carbon tax revenues can be used – UK Climate Change Levy

### 2. Helping to fund the Carbon Trust

- quasi-government organisation set up in 2001 (alongside the CCL)
  - £100M of CCL revenues directed to the Carbon Trust over its first three years, to support the short-term focus on energy savings and efficiency
- Carbon Trust is now privatised and is no longer funded by government

### 3. Helping to fund the Enhanced Capital Allowances Scheme

- ECA aims to stimulate investment in low carbon technologies
- Brings forward tax relief on capital expenditure on certain energy efficient products, i.e. cash flow benefits since tax relief on investment is provided earlier.



## UK Climate Change Levy interactions with: Climate Change Agreements (CCAs)

- **Climate Change Agreements** are voluntary agreements between industry and government; implemented in 2000
  - cover 54 sectors and 9,000 sites ~ 60% of UK industrial-delivered energy use
  - challenging, but realistic targets, to increase energy efficiency or reduce carbon dioxide emissions:
    - If targets met, **participants receive a substantial discount on CCL**
      - ✓ Up to 90% reduction on electricity use
      - ✓ Up to 65% reduction on gas, LPG and solid fuel.
    - If targets not met, the participant has to pay a fixed rate per tonne for the excess carbon emissions
- Ricardo-AEA helped developed the CCA scheme and continues to support the UK Government in managing the scheme – including baseline setting and MRV, and facilitating target-setting negotiations with industry sectors.

To avoid an overlap with EU ETS, fuel use at EU ETS facilities is excluded from CCAs (but their electricity use may be included, since EU ETS only covers fuels).

## UK Climate Change Levy interactions with: EU Emissions Trading System (EU ETS)

- **EU Emissions Trading System (EU ETS)** targets carbon reductions from fuel-use in energy intensive industry (does not cover electricity use)
- Electricity generators and certain CHP operators (excluding those in Northern Ireland) pay the Carbon Price Support Rate of CCL, which seeks to:
  - address low carbon prices in the EU ETS
  - incentivise low-carbon power generation
  - provide carbon price certainty to participant.
- **The CPS rate is informed by EU ETS prices** – set two years in advance, hence lags what the EU ETS is doing, which changes in real time.
- CCL needs to be paid irrespective of other policies (with the exception of CCAs)  
→ hence EU ETS participants in the UK pay both the CCL (for fuel and electricity use) and have to comply with the EU ETS (for fuel use).

## UK Climate Change Levy interactions with: Carbon Reduction Commitment Energy Efficiency Scheme (CRC)

- **Carbon Reduction Commitment Energy Efficiency Scheme (CRC)** targets energy efficiency and emissions reductions in large public and private sector organisations (e.g. including supermarkets, water companies, banks, local authorities and all central government departments).
  - CRC participants must monitor and report their emissions, and buy allowances for every tonne of carbon they emit.
  - Allowances can be bought at twice yearly fixed-price sales or traded on the secondary market.
- CCL needs to be paid irrespective of other policies (with the exception of CCAs)
  - **hence CRC participants pay both the CCL and for CRC allowances.**

To avoid an overlap with EU ETS and CCAs, electricity and fuel use regulated by these instruments are excluded from CRC.

## Challenges of carbon tax implementation: Lessons from UK and Climate Change Levy

- Challenge to demonstrate specific impact of carbon tax when multiple policies are being implemented to a target sector.
  - Easiest to ascertain the impact of the CCL at the start of its operation – it is widely considered that the majority of the CCL's impacts occurred before it came into operation: 'announcement effect', which focussed business attention on energy efficiency.
  - CCAs provide a means of leveraging the 'price effects' of the CCL.
- Choosing the right carbon tax rate – what rate is needed to achieve outcome sought, and over what time period does the tax need to be applied?
  - While CCAs are voluntary (industry can choose to pay CCL or comply with CCA) – CCL cost is substantially more than the cost of meeting CCA targets

## Challenges of carbon tax implementation

- Potential trade-off between complexity/administrative burden versus policy impact:
  - CCL covers a large number of business and public administrative users of energy, with a low cost accounting system since MRV is largely undertaken by energy suppliers
    - Price signal on its own hasn't achieved ongoing business attention on energy savings - energy use isn't required to be monitored by user and energy bills are often paid by procurement departments (who aren't responsible for reducing energy).
  - CRC covers a smaller number of energy users, but has a much higher MRV admin burden since individual participants monitor and report emissions
    - Business attention on energy savings is much higher - due to monitoring and reporting of emissions, as well as the high visibility of CRC allowance costs (which aren't 'hidden' in energy bill like CCL)
- While carbon tax should make your economy more efficiency, competitiveness impacts may still result – any exemptions or rebates to be contingent on achieving results, for example, as per CCAs?
  - CCA target negotiations include discussion about the technical and financial feasibility of the target.

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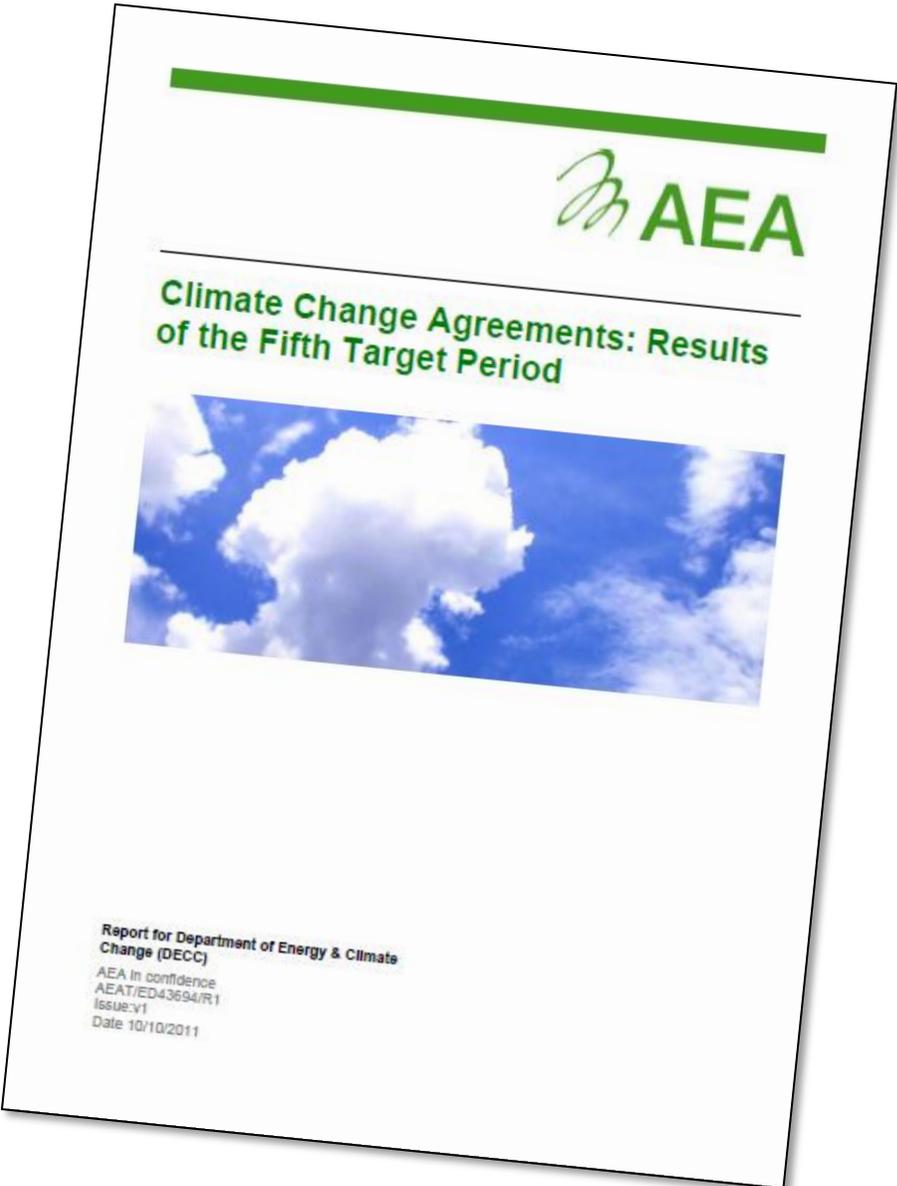
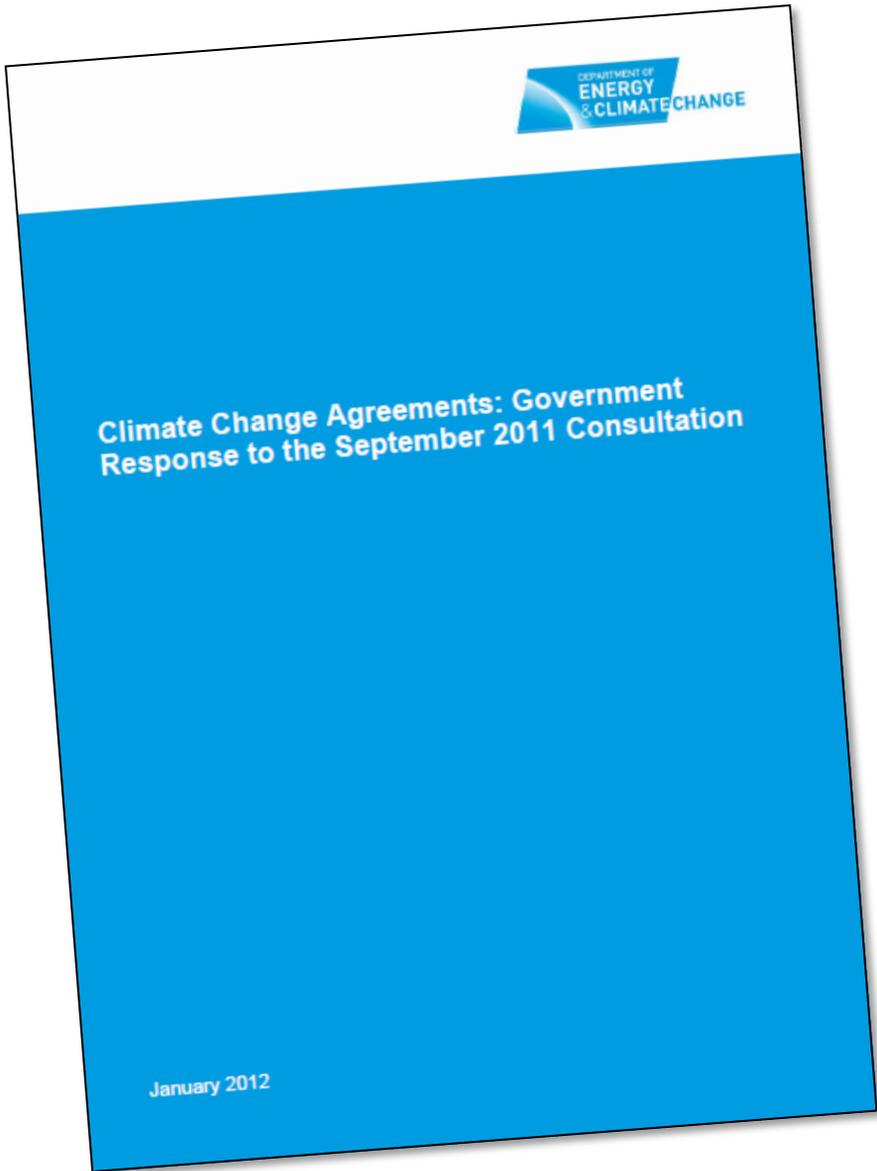
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# Carbon Price Support Rates – confirmed and indicative CPS rates

	Confirmed rates			Indicative rates	
	2013-14	2014-15	2015-16	2016-17	2017-18
<i>Carbon price equivalent (£ per tCO<sub>2</sub>)</i>	4.94	9.55	18.08	21.20	24.62
<b>Supplies of commodity</b>					
Natural gas (£ per kilowatt hour)	0.00091	0.00175	0.00334	0.00392	0.00455
LPG (£ per kilogram)	0.01460	0.02822	0.05307	0.06223	0.07226
Coal and other taxable solid fossil fuels (£ per gross gigajoule)	0.44264	0.85489	1.62534	1.90599	2.21332
Gas oil; rebated bioblend (£ per litre)	0.01365	0.02642	0.04990	0.05851	0.06795
Fuel oil; other heavy oil; rebated light oil (£ per litre)	0.01568	0.03011	0.05730	0.06719	0.07803



- Voluntary agreements between industry and government: implemented in 2000
- Cover 54 sectors with about 9,000 sites ~ 60% of UK industrial delivered energy use
- Targets to increase energy efficiency or reduce carbon dioxide emissions:
  - If targets met, participants receive a substantial discount on the Climate Change Levy (tax on energy used by business)
  - Targets are challenging but realistic to encourage compliance
  - If targets not met, the participant has to pay a fixed rate per tonne for the excess carbon emissions

- Climate Change Levy payable by consumers in, industry, commerce, agriculture, public administration, and other services
- Collected via energy suppliers

Commodity	Rate from 1 April 2013	Reduced rate of CCL for CCA holders
Electricity	0.524 pence per kilowatt hour	From 10% for 2013-14
Gas - Great Britain	0.182 pence per kilowatt hour	From 35%
Gas - Northern Ireland	0.064 pence per kilowatt hour until 31 October 2013 then main natural gas rate applies	None until 31 October 2013  From 35% as of 1 November 2013
Any petroleum gas, or other gaseous hydrocarbon, supplied in a liquid state	1.172 pence per kilogram	From 35%
Any other taxable commodity	1.429 pence per kilogram	From 35%

- A. Sectors regulated by Environmental Permitting Regulations, and/or;
- B. Energy intensive sectors (energy costs > 10% turnover)

## Main industrial sectors in CCAs

Iron & Steel

Chemicals

Paper

Food & Drink

Ceramics

Motor Manufacturers

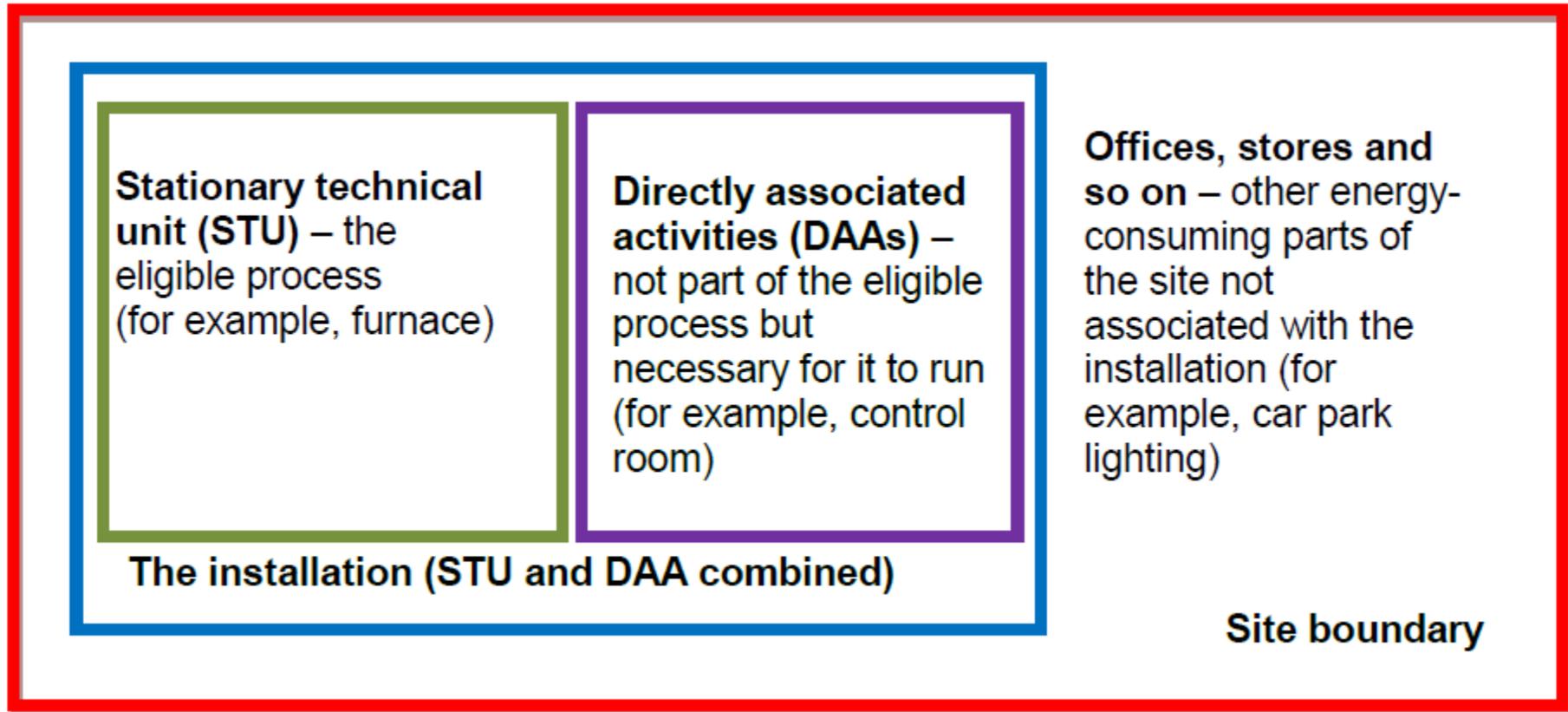
Printing

Foundries

Aluminium

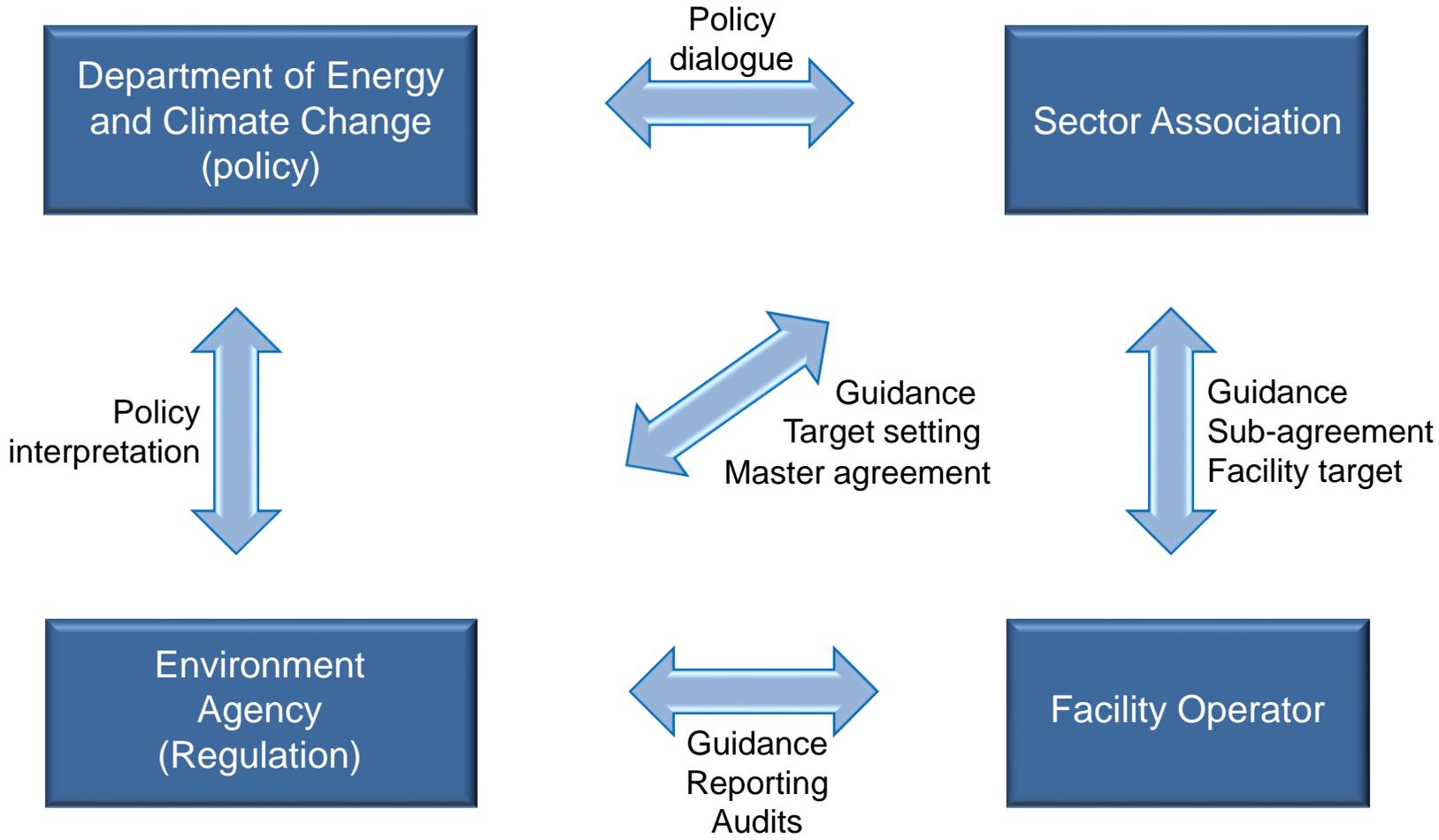
Cement





Source: CCA Operations Manual

- Additional rules:
  - 70:30 inclusion rule
  - Exclusion of EU ETS energy



- Negotiated between government and industry at sector level
- Challenging (i.e. better than ‘business as usual’) and realistic (i.e. within the financial capacity of the industry)
- Set for two-yearly intervals covering a ten year period
- Review point
- Individual operator targets combine to give the sector target overall
- Common base year (currently 2008 for most agreements)
- Relative or absolute, carbon or energy

## MRV

- Web-based register administered by the Environment Agency (the EA)
- Operators report performance every two years via sector associations
- Independent facility audits (by contractors appointed by the EA)
  - Risk-based
  - Random basis

## Compliance routes

- Under-performance against the target - operator must 'buy-out' by paying a penalty (currently £12/tCO<sub>2</sub>) for equivalent figure in tonnes of CO<sub>2</sub>.
- Over-performance may be banked for own future use

## First Phase

- Final reporting year was 2010
  - Target saving compared to sector base years was 18 MtCO<sub>2</sub>/year
  - Actual performance in 2010 was a saving of 28.5 MtCO<sub>2</sub>/year
- The scheme has resulted in a step-change in business engagement in energy efficiency
- 38 out of the 54 sectors met their 2010 targets outright (without trading)

## Second Phase

- Will run from 2013 to 2023
- Targets based on specific technologies and abatement measures which can be implemented over this period