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Consultation on the Recommendations of the Climate Change Simplification Project

Climate Change Instruments

Areas of overlap and options for simplification

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Executive Summary

- In keeping with the department's better regulation agenda, this paper reviews Defra's three major climate change instruments – EU Emissions Trading Scheme (EU ETS), Climate Change Agreements (CCAs), and the proposed Carbon Reduction Commitment (CRC)¹ – with a view to eliminating avoidable overlap, simplifying existing regulations, and ensuring that the regulatory burden on the economy is kept to a minimum.
- Environment policy should be the outcome of balanced decision-making. Interventions to meet environmental aims must also take account of wider economic and social objectives, including macroeconomic stability, business competitiveness, social inclusion, and reducing fuel poverty. While the policy framework continues to develop and evolve over time, the government is committed to looking strategically at the overall regulatory burden and developing a policy framework that delivers emissions reduction objectives with minimum regulatory requirements.
- The focus of this paper is not only on managing the administrative burden on business, but more broadly on reducing the regulatory burden of these instruments on the economy as a whole. This requires considering ways to reduce the administrative burden on business and government, as well as ways to improve the overall efficiency of the package of measures.
- The paper provides an overview of the policy landscape by describing each instrument, its coverage, its monitoring, reporting, and verification requirements, and the estimated administrative burden.
- Some overlap between instruments is unavoidable as climate change policy has to take account of multiple, different market failures at all levels of the economy, aggregate and by sector. However, it is essential to recognise the overlaps and manage them to remove any unnecessary burden.

¹ Formerly the Energy Performance Commitment or EPC.

- Three main types of overlaps are identified and discussed, along with suggestions for dealing with them. The overlaps are discussed in terms of
 - upstream and downstream instruments;
 - emissions directly targeted by each instrument; and
 - organisations targeted by more than one instrument.

Recommendations are intended to make the current set of climate change instruments more coherent and cost effective, as well as inform the development of future measures.

- **Overlap between upstream and downstream instruments.** Empirical and other evidence to-date indicates a substantial pass-through of EU ETS prices to electricity prices (wholesale and retail), effectively creating an overlap between the upstream EU ETS and downstream instruments such as CCAs and CRC. Businesses in the overlap face both higher electricity prices as a result of EU ETS and higher costs of reducing emissions to meet their CCA and CRC targets.
- Overlap of this type can be justified when instruments address separate and distinct market failures, for example, carbon pricing, under-investment in R&D, and barriers to energy efficiency. However, while this type of overlap may be unavoidable, it is important to ensure that downstream instruments are adding value, especially in light of changes to the upstream pricing mechanism. Any changes to downstream instruments should also consider the effect of policy uncertainty on long-term investment and the cost to business of dealing with a frequently changing suite of instruments, an important consideration in a rapidly changing global policy landscape.

Recommendation 1: On-going evaluation of domestic instruments such as CCAs and CRC (i) in the context of global action to reduce emissions and (ii) in terms of effectiveness in dealing with downstream market failures and inducing behaviour change. A monitoring and evaluation framework, including a timescale for regular evaluations, should be developed prior to implementation of domestic climate change instruments.

- **Overlap in emissions directly targeted.** The only overlap in directly targeted emissions is between EU ETS and CCAs. Emissions in the overlap are estimated to be 41.1 MtCO₂, or 46% of total CCA emissions.
- This type of overlap can increase the administrative burden on business and government. For the same emissions, businesses are required to comply with both EU ETS and CCA monitoring, reporting, and verification requirements and the government is required to verify the same activities twice in order to ensure compliance.

Recommendation 2: Examining the overlap in emissions directly targeted by EU ETS and CCAs and considering splitting the CCA target for current CCAs (if possible) and for post-2010 CCAs.

- **Organisations targeted by more than one instrument.** By far the most common overlap in instruments targeting the same organisation is between EU ETS and CCAs. Both instruments also overlap with CRC, but the overlap is limited. Targeting organisations with more than one instrument creates the potential for perverse incentives, but also provides opportunities for streamlining regulatory requirements and eliminating duplication.

Recommendation 3: Making targets consistent. Considering denominating CCA targets in absolute terms, such that perverse incentives are reduced and domestic instruments are better aligned with UK and international policy objectives. Due to the administrative burden of renegotiating CCA targets² and concerns regarding its effect on competitiveness, a change to absolute targets may not be feasible for the current set of CCAs (i.e., for targets up to 2010), but should be considered for future CCAs.

Recommendation 4: Removing unnecessary trading schemes. Ending the UK ETS market and linking CCAs to CRC instead, thus reducing the administrative burden of operating and participating in multiple, duplicative trading schemes while retaining the flexibility that trading provides CCA participants. For legal reasons, UK ETS market for CCA participants will continue for the current set of CCAs. Ending the UK ETS market and linking to CRC has been proposed for future CCAs.

Recommendation 5: Defining scheme boundaries on a simple and consistent basis. Defining CCA scheme boundaries (for example, on an installation basis) such that unnecessary overlaps are minimised, the potential for perverse incentives is reduced, and policy coherence is maximised. Such changes may not be feasible for the current set of CCAs, but should be considered for future CCAs. CRC scheme boundaries should be evaluated in the context of any changes to CCA eligibility.

Recommendation 6: Aligning monitoring, reporting, and verification requirements. Harmonising reporting periods and reporting units, standardising data and documentation to be submitted/stored under each scheme, and applying verification requirements consistently and proportionately across instruments, such that the administrative burden

² The agreements are voluntary and between two parties, with both parties having to agree to any changes.

(on government and business) is reduced and UK's energy performance is tracked more easily and transparently against its long-term climate change objectives. CRC requirements are being aligned with other instruments. Due to the administrative burden of renegotiating current CCAs, measures to align their requirements with other instruments may be feasible only for the next round.

Recommendation 7: Evaluating the potential for data sharing. Examining various data sharing arrangements that reduce overall administrative burden and address business concerns around commercial confidentiality of the data. Such arrangements are likely to increase the efficiency and cost effectiveness with which environmental outcomes are delivered.

- **Other options for simplification.** These options do not address any specific type of overlap, but are simplification measures that are likely to reduce overall administrative burden while maintaining environmental effectiveness.

Recommendation 8: Seeking to deliver, with the EU partners, further reductions in administrative burden by excluding small emitters from EU ETS, and including under CRC those small emitters who meet current CRC eligibility criteria (i.e., belonging to a large CRC organisation).

Recommendation 9: Seeking to deliver, with the EU partners, efficiency and other regulatory benefits from auctioning EU ETS allowances. Levels of auctioning are being considered as part of the current review of the EU ETS directive.

- EU ETS, CCAs, and CRC also interact with other instruments such as the energy efficiency requirements of the Integrated Pollution Prevention and Control (IPPC) Directive, the Large Combustion Plant Directive, Combined

Heat and Power policies, the Renewables Obligation, and other Directives implemented under the Pollution Prevention and Control regulations.

- **Overlap with energy efficiency requirements of IPPC.** IPPC energy efficiency requirements overlap with EU ETS, CCAs, and CRC in terms of emissions directly targeted. Emissions that overlap with EU ETS and CCAs are currently given a light touch treatment under IPPC. Extending the light touch treatment to CRC and enhancing current light touch measures for EU ETS participants are likely to produce further benefits, as trading schemes (and instruments with a trading component) provide a more cost effective alternative to requirements based on the use of best available techniques.

Recommendation 10: Extending IPPC light touch measures to CRC (subject to a sound legal basis) and disapplying all IPPC energy efficiency requirements from EU ETS installations. Implementing this recommendation will require consideration of ways to simplify and align Pollution Prevention and Control scheme boundaries with EU ETS and CRC so benefits of the light touch measures are not lost, and also detailed analysis to ensure that removal of IPPC energy efficiency requirements will not significantly affect the environmental outcome.

- Instruments such as the Renewables Obligation also interact with EU ETS, CCAs, and CRC by requiring electricity suppliers to source a specific and annually increasing percentage of the electricity from renewable sources. Such requirements restrict flexibility and limit the efficiency benefits of trading schemes such as EU ETS and CRC.
- There are a number of policies that provide incentives for the adoption of low carbon and renewable technologies, for example, combined heat and power policies. While such instruments do not directly affect the flexibility of trading schemes such as EU ETS and CRC in seeking out the most cost effective means of abatement, they could distort the market by reducing

the cost of the favoured technologies relative to others beyond what is economically efficient.

- Policies such as the Large Combustion Plant Directive target emissions other than carbon; specifically, the directive targets sulphur dioxide, oxides of nitrogen, and fine dust particles from combustion plants. Differences between carbon dioxide, nitrogen oxides, and sulphur dioxide in terms of their environmental impact (for example, in terms of their effect on local air quality) could justify the need for separate instruments. However, there are likely to be co-benefits from having separate instruments, and these need to be properly analysed and accounted for when designing the instruments.
- Directives, such as the Volatile Organic Compounds and Waste Incineration Directives, that are implemented under the Pollution Prevention and Control regulations sometimes set requirements and create incentives which are inconsistent with carbon reduction objectives. Inconsistency between climate change and other environmental objectives can increase the regulatory burden of organisations dealing with multiple instruments with different objectives, and make any long-term investment decision more difficult.
- The review only touches on areas of interaction between EU ETS, CCAs, and CRC and other policies that either directly or indirectly affect the level of carbon being emitted. However, these interactions need to be considered in more detail when developing domestic policy to tackle climate change in tandem with EU policies and directives.

Recommendation 11: Undertaking further analysis to examine (i) the interaction of CHP policies with other instruments and (ii) the potential for greater alignment of Pollution Prevention and Control's other objectives with climate change objectives.

1. Introduction

1.1 In keeping with the department's better regulation agenda, this paper reviews Defra's three major climate change instruments – EU Emissions Trading Scheme (EU ETS), Climate Change Agreements (CCAs), and the Carbon Reduction Commitment (CRC)³ – with a view to eliminating avoidable overlap, simplifying existing regulations, and ensuring that the regulatory burden on the economy is kept to a minimum.

1.2 Environment policy should be the outcome of balanced decision-making. Interventions to meet environmental aims must also take account of wider economic and social objectives, including macroeconomic stability, business competitiveness, social inclusion, and reducing fuel poverty. While the policy framework continues to develop and evolve over time, the government is committed to looking strategically at the overall regulatory burden and developing a policy framework that delivers emissions reduction objectives with minimum regulatory requirements.

1.3 The focus of this paper is not only on managing the administrative burden on business, but more broadly on reducing the regulatory burden of these instruments on the economy as a whole. Regulatory burden is defined in terms of

- the efficiency (allocative) effects of regulation, i.e., the balance between market failure and the distortive effect of government intervention; and
- the total administrative burden (on business and government) of complying with and administering/enforcing regulations.

1.4 Some overlap between instruments is unavoidable as climate change policy has to take account of multiple, different market failures at all levels of the economy, aggregate and by sector. However, it is essential to recognise the overlaps and manage them to remove any unnecessary burden.

³ Formerly the Energy Performance Commitment or EPC.

1.5 The paper considers ways to reduce the administrative burden on business and government, as well as ways to improve the overall efficiency of the package of measures. Recommendations are intended to make the current set of climate change instruments more coherent and cost effective, as well as inform the development of future measures.

1.6 The review has been undertaken keeping in mind the need for a comprehensive and robust policy framework capable of delivering the government's long-term climate change policy targets. The proposed climate change bill commits the UK to mandatory carbon dioxide emissions reductions of 26-32% by 2020 and of 60% by 2050. Therefore, this paper explores options for dealing with any overlaps (including options for simplification) keeping in mind the need for further significant emissions reductions in the UK over the next few decades.

1.7 In November 2006, Defra published its simplification plan. It included initiatives currently underway that are expected to deliver administrative burden reductions (on business) by 2010 of over 30%, or £158.8 million out of a total annual burden of £527.8 million. However, given the number of new regulations in the pipeline, the plan notes the need for additional initiatives to meet Defra's agreed 2010 net administrative burden reduction target of 25%. In late 2006, following discussions with other government departments, Defra decided to undertake a review of non-fiscal instruments used to tackle climate change. Confirmation of the review was included in the 2007 Energy White Paper.

1.8 The 2007 Better Regulation Commission report "Regulating to Mitigate Climate Change: A Response to the Stern Review", sets essential standards for policy makers in meeting the challenges of climate change by proposing seven tests for better climate change regulation. Keeping administrative costs to a minimum is one of the seven tests. Another test requires the government to develop and act consistently with a climate change strategy, with new initiatives being evidence-based, adding value to the existing climate

programme, and making clear which market imperfections they are seeking to resolve.

1.9 Defra's simplification agenda also has broad support from business. Submissions from various industry groups indicate that businesses believe there is significant scope for reducing the administrative burden of climate change measures without compromising environmental outcomes. Consultation on CRC highlights industry concern about potential overlaps between climate change instruments and the burden they place on business. In order to balance climate change objectives with maintaining economic growth and international competitiveness, it is necessary to keep the policy framework as simple as possible and accepted by business as being fair, logical, robust, and consistent with better regulation principles.

1.10 The review's initial scope and direction of travel was presented to the Business Climate Change and Energy Group. The comments and feedback arising from the presentation have informed the review (refer to Appendix E for a summary of comments).

1.11 The paper primarily looks at the EU ETS, CCAs, and the proposed CRC, focussing on areas of existing and potential overlap between them. It looks at scheme coverage as well as monitoring, reporting and verification requirements of each and suggests options for simplification that improve efficiency and reduce overall administrative burden.

1.12 The paper also considers other measures that either directly or indirectly affect the level of carbon being emitted, such as the Integrated Pollution Prevention and Control (IPPC) Directive, the Large Combustion Plant Directive, Combined Heat and Power policies, and the Renewables Obligation. It discusses the overlap with IPPC in some detail. It also provides an initial assessment of overlaps with other policies, and suggests some broad principles for dealing with them.

2. Three Major Climate Change Instruments

EU Emissions Trading Scheme

Description	<ul style="list-style-type: none"> ✓ EU cap-and-trade scheme targeting greenhouse gas⁴ emissions (currently includes only direct CO₂ emissions) ✓ Emissions capped in line with the traded sector's contribution towards meeting member states' Kyoto protocol and domestic targets⁵ ✓ Cap on emissions and allocation of allowances set out in each member state's National Allocation Plan ✓ Allowances currently allocated free of cost, based on each sector's projected emissions and each installation's historic baseline emissions ✓ The EU cap is an absolute CO₂ emissions reduction target
Coverage	<ul style="list-style-type: none"> ✓ Carbon-intensive industrial installations and combustion installations with a rated thermal input of greater than 20 MW⁶ ✓ Covers upstream (direct) emissions, including from electricity production using fossil fuels⁷ ✓ Covered 1062 installations at the start of Phase I (2005-07)⁸ and expected to cover around 923 installations at the start of Phase II (2008-12)⁹ ✓ Covered approximately 50% of total UK CO₂ emissions in 2003; Phase II expected to cover approximately 52% of total UK emissions ✓ Overlap with downstream instruments such as CCAs and CRC, as cost of EU ETS allowances largely passed on to downstream consumers in the form of higher electricity prices ✓ Overlap of 41.1 MtCO₂ in directly targeted emissions with CCAs ✓ Significant overlap with CCAs in terms of organisations

⁴ Greenhouse gases refer to carbon dioxide, methane, nitrous oxide, and three groups of fluorinated gases (sulphur hexafluoride, HFCs, and PFCs).

⁵ The EU is required to make an 8% reduction in greenhouse gas emissions compared to 1990 levels by the first Kyoto Protocol commitment period (2008 to 2012). A 1998 burden sharing agreement among member states on apportioning the 8% cut resulted in the UK having to reduce greenhouse gas emissions by 12.5% by 2012.

	targeted by more than one instrument, some overlap with CRC
Monitoring, Reporting, and Verification (MRV) Requirements	<ul style="list-style-type: none"> ✓ Verification and submission of annual emission report (calendar year basis), enter verified annual emissions figure into the national registry (confirmation by verifier required) ✓ Surrender of the equivalent number of allowances to the figure inputted into registry ✓ Submission of an improvement report ✓ Verification and submission of baseline data prior to each new phase ✓ IPPC installations in EU ETS to meet only light touch IPPC energy efficiency requirements
Administrative Burden	<ul style="list-style-type: none"> ✓ Average annual operational costs between £2.04/tCO₂ and ≤0.01/tCO₂ ✓ Burden significantly higher for small emitters ✓ Verification requirement (for annual emissions report and baseline emissions data) most burdensome

Appendix A provides a more detailed description of EU ETS, its coverage, MRV requirements, and administrative burden for Phases I and II.

⁶ An EU ETS installation is defined as a stationary technical unit where one or more Schedule 1 activities (of the Greenhouse Gas Emissions Trading Scheme Regulations) are carried out. Schedule 1 activities include energy activities (for example, boilers, electricity generation, combined heat and power), production and processing of ferrous metals, mineral industries, and pulp and paper industries.

⁷ Combustion of waste or biomass is also included in certain circumstances.

⁸ In Phase I, 388 installations covered by CCAs and the UK ETS were opted out of EU ETS, bringing the total number of participants to 674. These installations are included in Phase II.

⁹ The number of participants has changed between phases due to new entrants, closures, the inclusion of additional installations following expansion, and the removal of 126 installations following application of a de minimis rule (see paragraph 3.42).

Climate Change Agreements

Description	<ul style="list-style-type: none"> ✓ Voluntary agreement to meet energy efficiency/emissions reduction targets (direct CO₂ and indirect electricity emissions) ✓ Introduced alongside the climate change levy, intended to protect the competitiveness of the most energy-intensive industries ✓ Emissions reduction target of a little over 6.9 MtCO₂ per year by 2010 (current set of CCAs negotiated through 2013) ✓ Meeting CCA milestones entitles participants to an 80% discount on the climate change levy ✓ Targets relative or absolute¹⁰, denominated in terms of energy use or carbon emissions ✓ Trading allowed in UK ETS allowances – buying allowances to comply with CCA milestones or selling/banking any overachievement
Coverage	<ul style="list-style-type: none"> ✓ 51 energy-intensive sectors based on IPPC and energy intensity criteria ✓ Covers upstream (direct) emissions from electricity production and downstream (indirect) emissions from electricity use ✓ Covers 4,336 target units (and over 8,750 facilities)¹¹ ✓ Covers approximately 16% of UK's total CO₂ emissions ✓ Overlap with upstream EU ETS, as cost of EU ETS allowances are largely passed on to downstream consumers in the form of higher electricity prices ✓ Overlap in directly targeted emissions with EU ETS¹² – 46% (or 41.1 MtCO₂) of CCA emissions overlap with EU ETS ✓ Significant overlap with EU ETS in terms of organisations targeted by more than one instrument, some overlap with CRC

¹⁰ Currently, most targets are relative; only 5-6 sectors (out of 51) have chosen absolute targets.

<p>Monitoring, Reporting, and Verification (MRV) Requirements</p>	<ul style="list-style-type: none"> ✓ Bi-annual submission of data by operators to sector associations (every even year starting 2002, target period generally October 1-September 30 immediately preceding submission date) ✓ Bi-annual collection and presentation of data by sector associations to Defra for certification ✓ Independent verification of data and results not mandatory, but required for organisations trading in UK ETS allowances ✓ Robust measurement and reporting, record-keeping systems required for audit purposes¹³ ✓ Compliance with CCA double counting rules when directly targeted emissions overlap with EU ETS ✓ IPPC installations in CCAs to meet only light touch IPPC energy efficiency requirements
<p>Administrative Burden</p>	<ul style="list-style-type: none"> ✓ Less burdensome than EU ETS and UK ETS (because independent verification not mandatory, group verification allowed by sector) ✓ Independent verification (where required) accounts for the greatest proportion of CCA administrative costs; determining eligibility of site energy use for climate change levy also found to be complicated ✓ Independent verification costs estimated between £1,500-5,000 per site¹⁴ and sector associations charge £300 (on average) for coordination activities

Appendix B provides a more detailed description of CCAs, their coverage, MRV requirements, and administrative burden.

¹¹ A target unit is a facility or group of facilities sharing one target. A facility is the IPPC stationary technical unit, plus any directly associated activities and extra items allowed under the 90/10 rule.

¹² Direct emissions of approximately 500 installations are covered by both CCAs and EU ETS, with 331 granted temporary exclusion from Phase I. No exclusion provision in Phase II.

¹³ Defra undertakes independent (random) verification checks of a sample of companies' data to ensure that it is accurate.

¹⁴ UK ETS verification costs for direct participants estimated around £40,000 to £50,000 for large operators and £2,500 for small (single-site) operators.

Carbon Reduction Commitment

Description	<ul style="list-style-type: none"> ✓ Mandatory UK cap-and-trade scheme targeting carbon emissions (direct CO₂ energy and indirect electricity) from the large non-energy intensive business and public sectors ✓ Evidence of significant cost effective abatement opportunities in this rapidly growing sector¹⁵ ✓ Emissions reduction target of 4.0 MtCO₂ by 2020¹⁶; scheme expected to start in 2010 ✓ Allowances to be auctioned and revenues recycled to CRC participants ✓ Buy-only link with EU ETS to prevent price spikes in CRC allowance prices ✓ Organisations to face absolute carbon emissions target
Coverage	<ul style="list-style-type: none"> ✓ Large non-energy intensive organisations whose mandatory half-hourly metered electricity use exceeds 6,000 MWh per year¹⁷ ✓ Largely targets downstream (indirect) emissions from electricity use ✓ Expected to cover between 4,000 and 5,000 organisations ✓ Covers 52.1 MtCO₂, or a little less than 10% of UK's CO₂ emissions (71.1 MtCO₂ emissions without 6,000MWh inclusion threshold) ✓ Organisations with at least 25% of their emissions in CCAs exempt from CRC (estimated to reduce organisations and emissions coverage by up to 20%) ✓ Overlap with upstream EU ETS, as cost of EU ETS allowances are largely passed on to downstream consumers in the form of higher electricity prices ✓ Some overlap in organisations targeted by more than one instrument with EU ETS (around 5% of all CRC organisations may have some of their emissions

¹⁵ Based on the use of existing commercially available technology.

¹⁶ The government retains its commitment to achieving emissions reductions of 4.4 MtCO₂ per year from the large non-energy intensive sector. The Energy Performance for Buildings Directive is expected to deliver an additional 0.4 MtCO₂ per year from this sector.

	covered by EU ETS); a few organisations overlap with CCAs
Monitoring, Reporting, and Verification (MRV) Requirements	<ul style="list-style-type: none"> ✓ Prepare annual evidence pack (based on automatic meter reads where available, and energy bills where not) ✓ Report total energy use emissions annually (calendar year) ✓ Verification through self-certification and risk-based audits (20% of CRC organisations per year) ✓ Allowances to be auctioned, so no need for submission and verification of baseline emissions
Administrative Burden	<ul style="list-style-type: none"> ✓ Incorporates better regulation lessons learned from other schemes – includes a minimum inclusion threshold, allows self-certification¹⁸ (rather than mandatory independent verification) backed by a risk-based audit regime ✓ Estimated to be £0.46/tCO₂ for the 6,000 MWh inclusion threshold ✓ Expected to be lighter-touch than EU ETS, UK ETS, and CCAs, while performing as well (if not better) on other evaluation criteria

Appendix C provides a more detailed description of CRC, its coverage, MRV requirements, and administrative burden.

3. Overlap and Simplification

3.1 In order to effectively address the problem of climate change, government policy has to take account of multiple, different market failures at all levels of the economy, aggregate and by sector. The Stern review identifies three main market failures – the carbon price externality, under-investment in R&D, and barriers to the diffusion of cost effective measures and technologies to improve energy efficiency. When designing policies to take account of these

¹⁷ All energy consumption at such organisations (not just energy consumption as monitored by half-hourly meters) will be included in CRC, subject to de minimis rules to be determined through further consultation.

¹⁸ Based on an annual statement of energy emissions provided by energy suppliers for energy use through half-hourly meters and on energy bills for sites without half-hourly or other automatic meters.

market failures, some overlap between instruments is unavoidable. However, it is essential to recognise these overlaps and manage them to remove any unnecessary burden.

3.2 The overlaps between instruments have been classified into three types:

- between upstream and downstream instruments;
- in emissions directly targeted, and
- in terms of organisations targeted by more than one instrument.

This section discusses each type of overlap in turn, along with options for dealing with them.

3.3 It also discusses other options for simplification. These options do not address any specific type of overlap, but are simplification measures that are likely to reduce overall administrative burden while maintaining environmental effectiveness.

Overlap between upstream and downstream instruments

3.4 The effect of interventions such as the EU ETS, that are relatively upstream in the supply chain, can be classified into two types – *first-order effects* on installations directly targeted and *second-order effects* on downstream industries and consumers.

3.5 By raising the cost of emitting, installations directly targeted by an upstream instrument like EU ETS face higher costs of operation. A proportion of the additional cost is likely to be borne by the installation itself, with the remainder being passed on to downstream industries and consumers in the form of higher product prices (particularly higher electricity prices).¹⁹ First-order effects are the response of directly targeted installations to the higher costs of operation; for example, energy suppliers reducing their demand for fossil fuels in response to the EU ETS by changing their fuel mix. The

¹⁹ The degree of pass-through is determined by a number of factors, including market structure (for example, the more competitive the supplier market, the greater the degree of pass-through), characteristics of industry demand and supply, availability of substitutes and alternative sources of energy, existence of contractual obligations that prevent prices from adjusting, and the internal structure of firms (cost structure, level of vertical integration).

downstream response to higher product prices results in second-order effects; for example, energy-intensive industries reducing their electricity demand by switching to more energy efficient technologies in response to higher electricity prices.

3.6 EU ETS targets carbon intensive industries and combustion activities, including large electricity producers; in the UK, power generation currently receives approximately 60% of the allocation under the national allocation plan.²⁰ The cap on carbon dioxide emissions effectively raises the cost of coal-fired and highly CO₂-emitting electricity production. Research indicates that EU ETS allowance prices (or the opportunity cost of EU ETS allowances, as allowances are currently allocated free of charge) are generally passed-through to industrial consumers at the wholesale or retail level (see Box 1 below).

Box 1: Theory and Evidence on EU ETS pass-through

With EU ETS allowances currently being allocated free of cost, firms are actually only paying the cost associated with any additional emissions above their allocation. However, in making the decision to use an allowance to cover their own emissions, economic theory suggests that a firm will consider the opportunity cost of that action (i.e., the price at which the allowance could have been sold). Thus, regardless of whether the allowances were auctioned or allocated free of cost, theory suggests that a firm is likely to consider the opportunity cost of allowances as part of its costs of operation.

This is reinforced by evidence to-date. For example,

- ✓ DEFRA estimates the pass-through rates of the opportunity cost of EU ETS allowance prices to be
 - 94-100% to wholesale prices (from electricity generators to suppliers); and
 - 33-100% to retail industrial prices (from suppliers to industrial consumers)

²⁰ Emissions Trading: Impacts on Electricity Consumers, 2005. A summary report by Professor Paul Ekins, Policy Studies Institute.

- ✓ Sijm et al. (2006)²¹ find that power producers pass on the opportunity costs of EU ETS allowances to the price of electricity, with a pass-through rate between 60-100% in wholesale electricity markets in Germany and Netherlands.
- ✓ A survey of stakeholders conducted as part of a 2006 European Commission report on the EU ETS²² reported that about 50% of companies surveyed were already pricing in the value of CO₂ emissions into their daily operating decisions and 75% of the remainder intended to do so in the future.

3.7 Given the substantial pass-through of EU ETS costs to electricity prices, there is an overlap between the upstream EU ETS and downstream instruments such as CCAs and CRC. Businesses in the overlap face both higher electricity prices as a result of EU ETS and higher costs of reducing emissions to meet their CCA and CRC targets.

3.8 In well-functioning markets, any overlap between upstream and downstream instruments is inefficient – a single upstream instrument should be sufficient to seek out cost effective abatement across the supply chain. However, additional downstream instruments can be justified under certain circumstances.

→ **Market failures at the sectoral level that distort price signals from upstream instruments.** The economic efficiency argument for upstream instruments is that they produce a combination of direct and indirect effects that result in the most cost effective abatement across the supply chain.²³ However, market failures that distort/prevent upstream signals from seeking out these opportunities limit the efficiency of upstream interventions.

²¹ Sijm, J., Neuhoff, K., Y. Chen, 2006. CO₂ Cost Pass Through and Windfall Profits in the Power Sector. Cambridge Working Papers in Economics 0639.

²² EU ETS Review: Report on International Competitiveness, 2006. Prepared by European Commission Directorate General for Environment, McKinsey & Company, and Ecofys as input for the European Commission's review of the directive on emissions trading.

²³ For example, an upstream instrument might induce energy suppliers to change their fuel mix, and this might provide a lower cost means of abatement than any potential changes downstream agents/consumers could make.

→ **Difference between international and national climate change targets.** The climate change bill commits the UK to mandatory carbon dioxide emissions reductions of 26-32% over 1990 levels by 2020 and 60% over 1990 levels by 2050. This is more ambitious than EU ETS emissions reduction targets currently being discussed, and the price implied by the EU ETS target alone will not be sufficient to achieve UK's emissions reduction goals even if EU ETS could be expanded to cover the entire economy.

→ **Shifting to a low carbon economy.** Interventions that induce downstream behaviour change have the advantage of reducing long-term energy demand (by shifting the energy demand curve inward). Meeting UK's climate change targets requires significant adjustments by the UK economy, and instruments that induce behaviour change reduce the need for an ever-increasing stock of regulations that would otherwise be required to meet the target.

3.9 The current overlap between the upstream EU ETS and downstream CCAs and CRC has been justified in terms of these three reasons:

- CRC targets sector-specific market failures behind the low take-up of energy efficiency measures in the non-energy intensive sector;
- CCAs and CRC supplement the EU ETS by targeting emission reductions beyond those delivered by EU ETS; and
- CCAs and CRC are seen as key drivers of behaviour change.²⁴

3.10 The value of domestic interventions such as CCAs and CRC needs to be kept under review, especially in light of changes to the international policy landscape.

3.11 Given the global nature of the problem, trans-national measures to tackle climate change have clear economic efficiency benefits by allowing

²⁴ CCAs by creating incentives for industries to shift to more efficient ways of energy production and use and CRC by increasing organisational awareness and attracting the sustained attention of senior managers to carbon and energy issues.

emissions reductions to be made where they are most cost effective, unconstrained by national boundaries. The value of domestic instruments such as CCAs and CRC needs to be re-evaluated in the context of any significant global action to reduce greenhouse gas emissions. For example, a tighter EU ETS cap and scheme expansion (to cover additional sectors/gases/countries) will affect the contribution and effectiveness of domestic measures such as CCAs and CRC in reducing emissions.

3.12 On-going evaluation of the cost effectiveness of CCAs and CRC in overcoming downstream market failures and bringing about behaviour change is also essential. For example,

- impact of CCAs in increasing efficiency in energy production and use, and in shifting the energy demand curve inwards;²⁵ and
- effectiveness of CRC in overcoming market failures in the non-energy intensive sector, and acting as the driver for behaviour change.

3.13 Regular and on-going evaluation will enable policy-makers to identify interventions that are ineffective and act to correct or remove them. Defra guidance recommends a monitoring and evaluation framework be developed prior to policy implementation, setting out evidence to be gathered, including how and when the evidence is to be gathered, to measure progress towards the desired policy outcome. The monitoring and evaluation framework for CCAs and CRC should set out a timescale for evaluations (for example, every three years for the expected length of the policy) to assess effectiveness of the instrument in tackling downstream market failures and bringing about behaviour change.

3.14 However, a note of caution should be taken when considering changes to the existing suite of instruments. Frequent changes create policy uncertainty and have a negative effect on long-term investment. The

²⁵ CCA evaluations for the first two target periods (2002 and 2004) indicate overall over-achievement of emissions reduction targets – 9.8MtCO₂ per annum in target period 1 and 8.9 MtCO₂ per annum in target period 2. However, some of the over-achievement was due to structural changes in the steel sector (which accounts for approximately 25% of total CCA emissions).

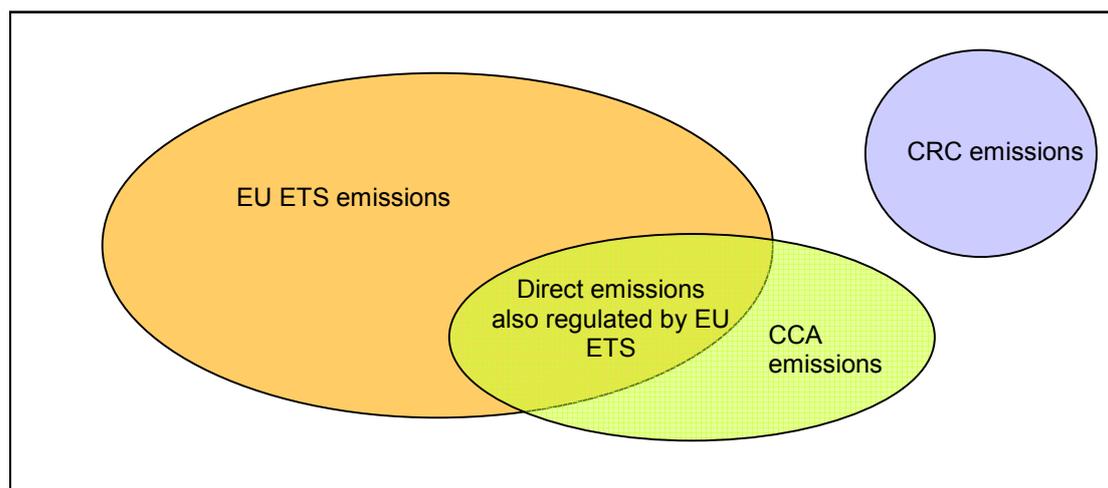
administrative burden placed on business from dealing with a frequently changing suite of instruments also needs to be considered. Such considerations are especially important in a rapidly changing global policy landscape, where there is a significant probability of further changes being required down the road.

Recommendation 1: On-going evaluation of domestic instruments such as CCAs and CRC (i) in the context of global action to reduce emissions and (ii) in terms of effectiveness in dealing with downstream market failures and inducing behaviour change. A monitoring and evaluation framework, including a timescale for regular evaluations, should be developed prior to implementation of domestic climate change instruments.

Overlap in emissions directly targeted

3.15 The only overlap in directly targeted emissions is between EU ETS and CCAs. The overlap area is estimated to be approximately 41.1 MtCO₂ (or 46% of total CCA emissions).

Chart 1: Overlap in emissions directly targeted

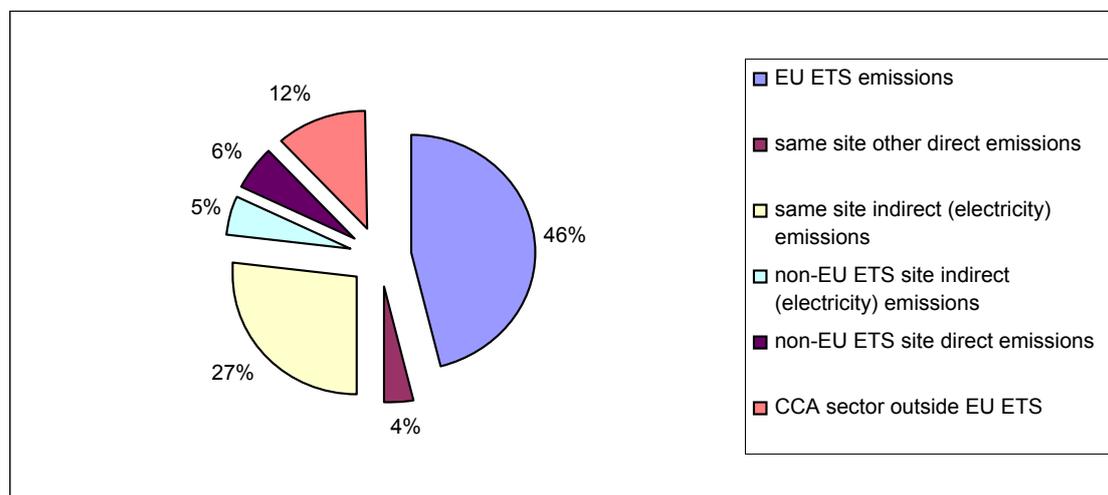


Source: Defra

3.16 While EU ETS covers direct combustion and process emissions, CCAs also cover indirect emissions from use of electricity and some direct fossil fuel

and process emissions not included in EU ETS. The most common case for EU ETS/CCA overlap is direct fossil fuel emissions. Chart 2 breaks down CCA emissions by EU ETS/non-EU ETS sites and direct/indirect emissions.

Chart 2: Breakdown of CCA emissions



Source: Defra

3.17 Participation in CCAs has allowed some installations to be temporarily excluded from Phase I of EU ETS. There are approximately 500 installations whose direct emissions are covered by both CCAs and EU ETS.²⁶ Of these 500 installations, 331 have been granted temporary exclusion from Phase I of EU ETS. There are no similar exclusion provisions for Phase II (2008-12).

3.18 Overlap in emissions between EU ETS and CCAs creates the potential for emissions to be double counted. Double counting occurs when the same emissions increase (or decrease) causes an installation to be penalised (or benefit) under both schemes. For example, emissions reductions that result in surplus EU ETS allowances could also result in over-achievement of CCA targets, which could then be converted into UK ETS allowances. The operator would be gaining allowances on both trading schemes for the same reduction.

²⁶ Climate Change Agreements – Results of the Second Target Period Assessment, Future Energy Solutions, July 2005.

Box 2: Dealing with Double Counting

CCA targets are corrected to take account of any EU ETS allowances bought, sold, or banked; surplus EU ETS allowances lead to a tightening of CCA targets and a shortfall leads to an easing of targets. CCA performance is compared to the corrected target and allowances are then bought or sold on UK ETS as required to meet the corrected target. If an operator chooses to retire surplus EU ETS allowances (and provide proof of cancellation), the CCA target remains unchanged.

Specifically, correcting CCA targets for any double counting requires

1. Calculating the percentage of EU ETS emissions in the overlap
2. Estimating the EU ETS allocation for the emissions overlap, by applying the percentage calculated in step 1 to the installation's EU ETS allocation for that year
3. Computing the surplus/shortfall in EU ETS allowances by comparing allocation to performance in the overlap area
4. Expressing the surplus/shortfall in the same units as the CCA target²⁷
5. Correcting the CCA target for any surplus/shortfall

Data used to calculate the emissions overlap and to judge performance in the overlap area are based on EU ETS verified data for the preceding calendar year. For example, EU ETS verified data for 2005 are used to calculate the emissions overlap for CCA target period 3 (October 1, 2005 - December 31, 2006). The lag is to allow sufficient time for verification at the end of an EU ETS reporting period. However, using year-old operations data to correct CCA targets could produce inaccuracies, particularly for dynamic or evolving industries and industries that are expanding or contracting.

In the latest CCA target period (2005-06), a net surplus of EU ETS allowances led to an overall tightening of CCA targets; only 4 out of 139 target units chose to cancel surplus EU ETS allowances to avoid the double counting correction.²⁸

²⁷ For example, converting EU ETS emissions from CO₂ into the same energy/carbon units as the target using CCA carbon factors, and dividing by actual throughput in the target period for relative targets.

²⁸ 46,000 allowances were retired, compared to a 3.8 million surplus that led to CCA targets being tightened and 198,000 deficit that led to CCA targets being eased.

3.19 For Phase I of EU ETS, industry preferred keeping existing CCA targets, rather than splitting the CCA target into EU ETS and CCA-only emissions. As a result, CCA rules have been developed to avoid double counting emissions covered by both schemes (see Box 2 for details).²⁹

3.20 UK's national allocation plan for Phase I incorporated domestic CCAs targets, with the relatively more ambitious CCA targets resulting in a tighter cap than would otherwise have been the case. Once included in EU ETS, businesses with overlap emissions are not only required to comply with EU ETS monitoring, reporting, and verification requirements, but for the same emissions also make double counting adjustments to their CCA targets or submit proof of cancellation of surplus EU ETS allowances. The government is required to verify these activities twice in order to ensure compliance with both schemes.

3.21 The administrative burden on business and government of dealing with this overlap is only going to increase with the start of Phase II of EU ETS, as installations that have opted out of Phase I will not be given that option in the next phase.

3.22 Eliminating the overlap by splitting the CCA target into EU ETS and CCA-only emissions will reduce administrative burden (on business and government) without affecting overall emissions reductions – overlap emissions would continue to be subject to the EU ETS cap, with targets equivalent to current CCAs established for CCA-only emissions. Splitting the target in this way would eliminate the need for the double counting rule/submitting proof of cancellation of EU ETS allowances, and reduce the cost on business of demonstrating compliance and on government of verifying compliance with CCA targets. The benefits of splitting the CCA target in this way will accrue regardless of the coverage and availability of the climate change levy discount.

²⁹ Methodology for avoiding double counting is set out in CCA23: Avoiding Double Counting Between CCA and EU ETS.

Recommendation 2: Examining the overlap in emissions directly targeted by EU ETS and CCAs and considering splitting the CCA target for current CCAs (if possible) and for post-2010 CCAs.

Overlap in terms of organisations targeted by multiple instruments

3.23 A third type of overlap is in terms of organisations targeted by more than one instrument, even though each instrument may be targeting separate emissions. By far the most common overlap in instruments targeting the same organisation is between EU ETS and CCAs. Both instruments overlap with CRC, but the overlap is limited; roughly 5% of the 5,000 organisations within the CRC target sectors are estimated to have part of their direct energy use emissions covered by EU ETS and a small number of organisations will have part of their emissions covered by CCAs.

3.24 Unlike the overlap in directly targeted emissions, it is not necessarily inefficient that an organisation is targeted by more than one instrument. However, considering two aspects of the regulatory burden can reduce the potential negative effects of such an overlap.

→ **Minimising the potential for perverse incentives.** Perverse incentives arise when organisations restructure/reclassify their activities, not based purely on business or operational reasons, but on minimising their cost of complying with climate change regulations. Such incentives lead to an inefficient allocation of resources and undermine economic growth.

→ **Maximising synergies and minimising duplication across instruments.** Taking advantage of opportunities to streamline regulatory requirements and eliminate duplication given the similar emission reduction/energy efficiency objectives of these regulations.

3.25 From a better regulation perspective, multiple interventions can be justified if the combination of interventions produces greater emissions

reductions than any one of the interventions alone. The overlap in organisation targeted by EU ETS, CCAs, and CRC need not be inefficient as long as each instrument targets separate emissions and contributes to overall emissions reduction. However, efficiency could be improved by making policy package more coherent and consistent. Some areas where this might be possible are identified and discussed below.

3.26 Making targets consistent. EU ETS, CCAs, and CRC aim to reduce emissions from the industrial and commercial sectors. Inconsistencies in how targets are set and performance is judged could create perverse incentives for organisations targeted by more than one instrument to restructure or reclassify their activities in ways that are economically inefficient but that minimise the combined burden of the instruments.

3.27 Currently, organisations face a combination of absolute and relative emissions reduction targets. EU ETS and CRC targets are in terms of absolute emissions reduction. CCA targets (which pre-date EU ETS and CRC) can be relative or absolute, with most current targets being relative. Relative CCA targets are defined in terms of carbon emissions or energy use per unit of output during the target period.

3.28 Performance against ex-ante equivalent absolute and relative targets could be different based on whether industry growth is above or below expectations. For example, if industry growth is above expectations, meeting a relative target will require smaller emissions reductions than what would be required to meet an ex-ante identical absolute target (the converse is true for lower-than-expected industry growth). This difference in how performance is judged could result in organisations targeted by, say EU ETS and CCAs, distorting their production choices in order to minimise their compliance burden. Aligning how targets are set and hence how performance is judged across instruments will reduce the incentive for this type of behaviour and produce efficiency benefits.

3.29 In today's policy context, choosing to express CCA targets in absolute terms might have several advantages. First, climate change is a global problem requiring a global solution, and domestic instruments should be designed to be consistent with international interventions to tackle the problem, such as EU ETS and its absolute emission reduction goal. Second, mandatory emissions reductions proposed in the climate change bill place an emphasis on the quantity certainty, which absolute targets provide more than relative targets. However, in moving to absolute targets, consideration should also be given to competitiveness and economic growth implications of moving too fast.

3.30 While making targets consistent in this manner will not fully eliminate perverse incentives from EU ETS and CCAs co-existing on the same site, it will remove an important contributing factor. Eliminating such incentives entirely will require the net marginal benefit to business³⁰ per tonne of carbon reduced to be the same across instruments.

Recommendation 3: Making targets consistent. Considering denominating CCA targets in absolute terms, such that perverse incentives are reduced and domestic instruments are better aligned with UK and international policy objectives. Due to the administrative burden of renegotiating CCA targets³¹ and concerns regarding its effect on competitiveness, a change to absolute targets may not be feasible for the current set of CCAs (i.e., for targets up to 2010), but should be considered for future CCAs.

3.31 Removing unnecessary trading schemes. The UK ETS scheme for direct participants ended in December 2006, but the market still continues for CCA participants. Participants can buy UK ETS allowances to help comply

³⁰ Benefit to business of reducing emissions (for example, in terms of CCL discount or value of an EU ETS allowance) less the cost incurred by business in reducing emissions.

³¹ The agreements are voluntary and between two parties, with both parties having to agree to any changes.

with their CCA milestones. They can also convert any over-achievement into UK ETS allowances, either to be sold or banked against future targets.

3.32 Trading in the UK ETS offers CCA participants a cost effective way of making the required emissions reductions – facilities have the option of reducing their own emissions or buying reductions from sources that are able to reduce emissions at a lower cost. Thus, it is important to retain the trading aspect of CCAs, or any instrument chosen to replace it.

3.33 However, with UK ETS having ended for direct participants, linking CCAs to other trading schemes such as EU ETS or CRC has significant advantages.

- First, it will reduce the number of trading schemes operating in the economy while still providing CCA participants with a cost effective means of reducing emissions; any shortfall can be made up and any over-achievement banked in terms of EU ETS or CRC allowances instead.
- Second, it will enhance the trading option for CCA participants. If the UK ETS market were to continue post-2010 without direct participants, allowances could only be created based on over-achievement of CCA targets. This would essentially make the UK ETS into a credit exchange programme, and such programmes are generally less efficient than full-fledged cap-and-trade schemes because of uncertainty over the future availability of credits.
- Third, linking CCAs either directly or indirectly (for example, through the buy-only link in the CRC market) to the EU ETS would make up for any loss of flexibility from splitting CCA targets (recommendation 2).

3.34 A direct two-way link with EU ETS is not a realistic option given the downstream nature of CCAs; banking any over-achievement in CCA targets in terms of EU ETS allowances may require facilities to apply for project credits under Kyoto project mechanisms. A direct link with CRC, and an indirect link to EU ETS through CRC's buy-only provision, is a more realistic option. The

consultation document for CRC proposes the end of the UK ETS market after the current round of CCAs, with any new CCAs to link directly to the CRC market.

Recommendation 4: Removing unnecessary trading schemes. Ending the UK ETS market and linking CCAs to CRC instead, thus reducing the administrative burden of operating and participating in multiple, duplicative trading schemes while retaining the flexibility that trading provides CCA participants. For legal reasons, UK ETS market for CCA participants will continue for the current set of CCAs. Ending the UK ETS market and linking to CRC has been proposed for future CCAs.

3.35 Defining scheme boundaries on a simple and consistent basis.

Current definition of scheme boundaries varies by instrument. For example,

- **EU ETS installations** are defined in terms of a stationary technical unit where one or more Schedule 1 activities of the Greenhouse Gas Emissions Trading Scheme Regulations are carried out.³²

- **CCA facilities** are defined either in terms of an IPPC stationary technical unit where one or more activities listed in Schedule 1 of the Pollution Prevention and Control Regulations are carried out³³ or in terms of the Energy Intensity criteria, plus any directly associated activities and extra items allowed under the 90/10 rule³⁴.

³² Schedule 1 activities include energy activities (for example, boilers, electricity generation, combined heat and power), production and processing of ferrous metals, mineral industries, and pulp and paper industries.

³³ Schedule 1 activities cover energy industries, production and processing of metals, mineral industries, chemical industries, waste management, Solvent Emission Directive activities, and other activities such as paper, pulp and board manufacturing, carbon activities, tar and bitumen activities, coating activities, printing and textile treatments, manufacture of dyestuffs, printing ink and coating materials, timber activities, activities involving rubber, treatment of animal and vegetable matter and food industries, and intensive farming.

³⁴ A site is eligible to claim a climate change levy discount only on the energy used in eligible processes and directly associated activities. However, according to the 90/10 rule if more than 90% of the total energy used on site is used on eligible processes, the site can claim a tax levy reduction on all of its energy use.

→ **CRC organisations** are defined in terms of large, non-energy intensive organisations whose mandatory half-hourly metered electricity use³⁵ exceeds 6,000 MWh per year. All energy consumption by such organisations (not just metered energy consumption) is to be included in CRC, and organisations with more than 25% of their emissions in CCAs can opt out of the scheme.

3.36 In terms of administrative burden, determining whether energy use at a particular site is eligible for inclusion in CCAs is found to be complicated and burdensome, both for business and government. There are two different sets of eligibility criteria, one based on Pollution Prevention and Control definitions and the other based on energy intensity. Any activities directly associated with either criteria are eligible for inclusion in CCAs. If 90% of a site's energy use occurs as part of eligible Pollution Prevention and Control or energy intensive process activities, the remaining 10% of the site's operations are eligible to be included in CCA under the 90/10 rule. Inconsistencies in how scheme boundaries are defined between EU ETS and IPPC are discussed in later (see paragraph 4.11).

3.37 Such complexity can create inconsistencies in how scheme boundaries are defined. It can create unnecessary overlaps, such as the overlap in directly targeted emissions between EU ETS and CCAs discussed under recommendation 2. It can also create perverse incentives, where businesses seek to define their activities in ways that minimise their compliance burden. Finally, it can reduce policy coherence as indistinct scheme boundaries can leave some emissions unregulated; for example, organisations with 25% or more of their emissions in CCAs are allowed to opt out of CRC, potentially leaving some of their emissions unregulated under either scheme.

³⁵ Half-hourly meters are mandatory at sites where peak electricity consumption is in excess of 100 kW for three consecutive months over a 12-month period, which translates approximately to a minimum electricity consumption of about 250 MWh, or a bill on the order of £15,000 per annum.

Recommendation 5: Defining scheme boundaries on a simple and consistent basis. Defining CCA scheme boundaries (for example, on an installation basis) such that unnecessary overlaps are minimised, the potential for perverse incentives is reduced, and policy coherence is maximised. Such changes may not be feasible for the current set of CCAs, but should be considered for future CCAs. CRC scheme boundaries should be evaluated in the context of any changes to CCA eligibility.

3.38 Aligning monitoring, reporting, and verification requirements.

There are opportunities for eliminating unnecessary duplication in monitoring, reporting, and verification activities undertaken to comply with various schemes.

- Aligning reporting periods: EU ETS requires annual reporting on a calendar year basis. CCAs require bi-annual reporting, with October 1-September 30 as the typical reporting period.
- Aligning reporting units: Reporting units for EU ETS are in terms of carbon dioxide emissions, whereas CCA reporting units are largely in terms of energy consumption.

In addition, there are opportunities for standardising data and documentation to be submitted/stored under each scheme and for applying verification requirements consistently and proportionately across instruments.

3.39 As EU ETS, CCAs, and CRC share similar emissions reduction/energy efficiency objectives, standardising monitoring, reporting, and verification requirements will reduce the administrative overhead on business of demonstrating and on government of verifying compliance with multiple instruments without compromising the environmental outcome. In addition to these benefits, aligning reporting periods (preferably on a calendar year basis) and reporting units (preferably carbon-denominated) consistently across instruments will allow UK's energy performance to be tracked more easily and transparently against its long term climate change policy objectives.

Recommendation 6: Aligning monitoring, reporting, and verification requirements. Harmonising reporting periods and reporting units, standardising data and documentation to be submitted/stored under each scheme, and applying verification requirements consistently and proportionately across instruments, such that the administrative burden (on government and business) is reduced and UK's energy performance is tracked more easily and transparently against its long-term climate change objectives. CRC requirements are being aligned with other instruments. Due to the administrative burden of renegotiating current CCAs, measures to align their requirements with other instruments may be feasible only for the next round.

3.40 Evaluating the potential for data sharing. Following on from the previous recommendation, the department should investigate the potential for data sharing within Defra, across the Defra family, and across government departments. Currently, industry reports compliance-related data separately under various schemes. Sharing data across schemes has the potential to reduce the administrative burden of climate change measures on business.

3.41 Data sharing has the benefit of allowing businesses to submit data once, rather than having to submit the same or similar data multiple times to comply with multiple instruments. Information could be recorded once at a central location and be shared as needed among the appropriate regulators and consultants, improving the cost effectiveness of delivering the required environmental outcome. To the extent that monitoring, reporting, and verification requirements are aligned across instruments (recommendation 6), the feasibility of data sharing and the benefits to be had from any such arrangements will be increased.

3.42 While data sharing has the potential for significant cost savings, businesses have raised concerns about confidentiality and potential for misuse of the data. In addition, Freedom of Information considerations are

important when considering data sharing across government departments. There is a risk that balancing effective data sharing with commercial confidentiality could produce a data sharing arrangement that is onerous and administratively burdensome for the department. Any model for data sharing needs to be evaluated on its ability to reduce the overall administrative burden, not just reduce the administrative burden on business at the expense of an even greater burden on government.

3.43 As part of its Resource Efficiency Project, the Environment Agency is reviewing the reporting of resource use (including energy usage) under Pollution Prevention and Control regulations, with a view to consolidating reporting requirements across these activities. A similar exercise looking at the potential for data sharing across EU ETS, CCAs, and CRC is recommended to improve the efficiency and cost effectiveness with which emissions reductions are delivered. The Office of Climate Change has recently undertaken a review of the climate change delivery landscape, and it is expected to consider the potential benefits of data sharing across government.

Recommendation 7: Evaluating the potential for data sharing. Examining various data sharing arrangements that reduce overall administrative burden and address business concerns around commercial confidentiality of the data. Such arrangements are likely to increase the efficiency and cost effectiveness with which environmental outcomes are delivered.

Other simplification opportunities

3.44 Excluding small emitters from EU ETS. EU ETS places a disproportionately high administrative burden on small emitters. Moreover, these emitters account for only a small fraction of total emissions.

3.45 Table 1 illustrates the estimated change in installations and emissions included in EU ETS for various emission thresholds.

Table 1: Europe-wide EU ETS participation and emissions coverage, by emissions threshold

Emissions threshold (tCO ₂ /year)	Number of participants	Change in participants (%) ³⁶	Emissions included in EU ETS (millions tCO ₂)	Change in emissions included in EU ETS (%)
Current	10512		2173	
5000	8807	-16%	2170	0.0%
10000	7098	-32%	2158	-1.0%
25000	4746	-55%	2120	-2.4%
50000	3204	-70%	2060	-5.2%

Source: Ecofys report (2005)³⁷

3.46 Based on these estimates, establishing a minimum emissions threshold can be expected to reduce overall administrative burden without significantly affecting the environmental outcome.

3.47 Another alternative would be to establish a minimum capacity threshold. The Ecofys report finds that even significant shifts in the capacity threshold will have little or no effect on the number of included installations in most member states; most countries already exclude small installations and capacity of the remaining installations tends to be much higher than the current threshold level.³⁸ However, another study³⁹ estimates that increasing the capacity threshold from 20 to 35MW would remove 45% of installations and 2.7% of emissions and an increase to 50MW would remove 55% of installations and 3.5% of emissions.

3.48 Rather than raising the capacity threshold, implementing a de minimis rule will also exclude small emitters from the EU ETS. A de minimis rule excludes all units below a certain size from calculation of an installation's

³⁶ Installations excluded would largely be among combustion installations (especially district heating, food industry), and in the ceramics, paper and board, and (to a lesser extent) glass sectors.

³⁷ Small Installations Within the EU Emission Trading System – Summary, Ecofys, 2005. A report commissioned by the Ministry of Economic Affairs, The Netherlands.

³⁸ Only the ceramics and glass sectors and combustion installations are likely to be affected by a shift in capacity threshold.

³⁹ EU Emissions Trading Scheme Phase II: Definition of Combustion Installation, 2005. A report by Entec UK Limited for Defra.

capacity. Following a consultation in July 2006, the UK National Allocation Plan for Phase II introduces a voluntary de minimis threshold of 3MW in the calculation of the aggregation rule, and has also revised its interpretation of the ceramics definition. Both these measures will exclude certain small emitters from the scheme; the de minimis threshold excludes 94 installations (approximately 10% of installations) representing less than 0.3% of emissions and adjustment to the ceramics definition excludes a further 32 installations (approximately 3% of installations) representing 0.1% of emissions.

3.49 However, as Table 1 illustrates, there is further scope for excluding small emitters from EU ETS without significantly affecting the environmental outcome. Excluding small emitters from EU ETS (and leaving their emissions unregulated) is not likely to have major implications for overall emissions reduced.⁴⁰ The current review of EU ETS is considering raising the threshold higher to exclude a greater number of small emitters.

3.50 In the UK, to the extent that small emitters belong to large non-energy intensive organisations, they will naturally fall into CRC if exempted from the EU ETS.⁴¹ Most installations exempt under a reasonable emissions/capacity/de minimis threshold can be expected to meet the requirements to be included under CRC as part of a larger CRC organisation. CRC is designed to be lighter touch than EU ETS in terms of its administrative burden, and the trade-off between its monitoring, reporting and verification requirements and environmental risk is more suitable for small emitters than EU ETS.

3.51 Regulating small emitters under CRC rather than EU ETS is likely to reduce administrative burden while still maintaining the level of environmental effectiveness. It is also likely to reduce the overlap in instruments targeting

⁴⁰ It is also worth noting that from an EU-wide perspective exempting small emitters from EU ETS does not mean exempting them from climate change mitigation. Across the EU such installations will still operate within the context of the EU 20% reduction target, the Energy Services Directive, and the Energy Performance of Buildings Directive.

⁴¹ CRC coverage is defined on an organisational basis, rather than an installation basis under EU ETS. The majority of EU ETS small emitters (installations) are likely to be part of a larger CRC organisation, and so would fall within CRC if they were to leave the EU ETS.

the same organisation, as the number of CRC organisations with emissions in EU ETS will now be substantially lower.

Recommendation 8: Seeking to deliver, with the EU partners, further reductions in administrative burden by excluding small emitters from EU ETS, and including under CRC those small emitters meeting current CRC eligibility criteria (i.e., belonging to a large CRC organisation).

3.52 Consistent approach to auctioning. There are a number of different ways allowances can be allocated as part of a trading scheme.

- *Free allocation*, where allowances are allocated free of cost, based on projected emissions from a baseline. This allocation methodology has been shown to provide windfall profits, as opportunity cost of EU ETS allowances is passed on downstream consumers in the form of higher product prices, especially higher electricity prices (refer to Box 1 for a more detailed discussion).⁴²
- *Auction*, where emitters are required to pay for the right to emit, with allowances allocated based on demand, or willingness to pay. This allocation methodology eliminates any windfall profits enjoyed under free allocation and requires installations to bear the full social cost of emissions arising from their activities.

3.53 Currently, EU ETS allowances are allocated free of cost, based on each country's national allocation plan. However, an increased level of auctioning is expected in the future. CRC proposes auctioning allowances, along with a mechanism to recycle revenues.⁴³

3.54 In terms of regulatory burden (allocative efficiency and administrative costs), auctioning is preferred to free allocation.

⁴² The cost is substantially passed through by power generators to energy suppliers and consumers further downstream. However, some other industrial sectors such as iron and steel and cement are less able to pass through costs and so do not receive the same level of windfall profits.

⁴³ Auctioning with revenue recycling makes a trading scheme revenue neutral from the government perspective. It is equivalent to free allocation at the aggregate level, but could be different at the organisation level depending on the design of the recycling mechanism.

- **Efficient allocation** of resources requires that emissions allowances be allocated based on demand, or willingness to pay. Rather than using projected emissions from a baseline as a proxy, auctions reveal actual demand and let allowances be allocated in the most efficient manner possible. Auctions also improve allocative efficiency by correcting for the market failure in carbon pricing, by requiring the operators pay the full social cost of their actions. Finally, auctions reduce the likelihood of gaming and regulatory capture, with some groups having more influence than others and introducing unnecessary distortions to how resources are allocated.
- Auctions are also likely to be **less administratively burdensome** (on business and government) than an equivalent free allocation methodology. It eliminates the need for complex allocation rules and negotiations, which are likely to require greater resource, information, and knowledge than required to operate and participate in an auction. The administrative burden on business of developing the UK national allocation plan for Phase I was estimated to be £4.2 million – £2,000-5,000 for small firms and £6,000-14,000 for larger emitters. The cost to government was also substantial.

3.55 Auctioning EU ETS allowances in itself should not raise any significant downstream equity issues. Most participants are already factoring the opportunity cost of EU ETS allowances into their operation costs, and passing on a proportion of these costs to downstream consumers; electricity producers, in particular, have been found to pass on a substantial proportion of costs to downstream customers (wholesale and retail) in the form of higher electricity prices. An auction would effectively eliminate the windfall profits currently enjoyed under free allocation.

Recommendation 9: Seeking to deliver, with the EU partners, efficiency and other regulatory benefits from auctioning EU ETS allowances. Levels of auctioning are being considered as part of the current review of the EU ETS directive.

4. Interaction with other instruments

4.1 EU ETS, CCAs, and CRC also interact with other instruments such as IPPC, the Large Combustion Plant Directive, Combined Heat and Power policies, the Renewables Obligation, and waste policies.

Overlap with Integrated Pollution Prevention and Control requirements

4.2 A significant overlap exists between emissions directly targeted by EU ETS, CCAs, and CRC and the IPPC.

4.3 Activities regulated under Pollution Prevention and Control regulations are split into two categories:

- those subject to IPPC; in England and Wales these are Part A(1) activities regulated by the Environment Agency and the generally less polluting Part A(2) activities regulated by local authorities⁴⁴; and
- those subject to Part B, or air pollution controls regulated by local authorities.

IPPC activities require a permit to operate, and energy efficiency is one component of the permit.

4.4 To the extent that EU ETS, CCAs and CRC are each capable of providing an incentive to use energy efficiently, additional IPPC requirements for emissions already covered by these instruments are not necessary. For this reason, light touch IPPC measures have been introduced for installations that are successful in meeting their CCA targets and installations included in EU ETS. No similar provisions have been made for the overlap (in a small number of cases) with CRC.

⁴⁴ About 12% of IPPC installations in England and Wales are covered by Part A(2). In Scotland and Northern Ireland, SEPA and NIEHS respectively regulate all IPPC installations, and there is no local authority role.

4.5 All installations falling under the scope of IPPC are required to meet a set of defined *basic energy efficiency requirements*, including

- producing an annual report on energy consumption of the installation;
- monitoring energy flows and target areas for reduction (to be updated annually);
- monitoring carbon monoxide (where practicable) in order to optimise combustion and oxygen in waste gases;
- ensuring that the plant is operated and maintained to optimise the use and minimise the loss of energy; and
- ensuring appropriate containment methods are employed and maintained to minimise energy loss.

4.6 In addition, IPPC guidance states that organisations not participating in CCAs (and the now ended UK ETS) are required to meet *additional energy efficiency requirements*, including

- use of energy efficiency techniques, such as heat recovery from different parts of the processes, minimisation of water use and closed circulating water systems, optimised insulation, plant layout to reduce pumping distances, phase optimisation of electronic control motors, and optimised efficiency measures for combustion plants
- use of energy supply techniques, such as utilising waste heat from cooling operations to provide space heating, generation of energy from waste, and use of less polluting fuels

The regulator determines the precise nature of the additional energy efficiency requirements.

4.7 In practice, the Environment Agency disapplies the additional energy efficiency requirements for carbon dioxide emissions from EU ETS installations. However, the light touch measures could go even further. The EU ETS directive allows member states the discretion not to apply any of the IPPC energy efficiency requirements (basic and additional) to installations that are also subject to EU ETS. Exempting EU ETS installations from all IPPC energy efficiency requirements will reduce regulatory burden on business,

most likely without affecting the environmental outcome (although more detailed analysis is needed to confirm that this would be so in all sectors). It must be borne in mind that energy efficiency requirements are relevant not only to carbon emissions, but also more generally to resource use and to reducing wasteful or unnecessary energy consumption.

4.8 Trading mechanisms such as EU ETS and CRC provide businesses with a flexible and cost effective means of reducing direct and indirect emissions and improving energy efficiency. Use of more prescriptive measures, such as establishing emission limit values for a range of pollutants based on use of best available techniques as required under IPPC, are likely to be generally less efficient. The latter may be preferred for greenhouse gas emissions other than carbon dioxide, which are emitted by only a small number of installations and consequently have a more limited potential for trading. However, setting emission limit values for greenhouse gases covered by EU ETS (currently only carbon dioxide) is not allowed, unless necessary for protecting the local environment.

4.9 Market-based instruments have a significant advantage over more prescriptive forms of regulation.

→ **Lower information requirements.** This is especially important in climate policy, where there are likely to be significant differences in firms' ability to reduce emissions. For measures based on use of best available techniques to be as cost effective as market-based instruments requires the regulator having detailed information about the technical and economic viability of the candidate techniques for various firms/sectors, information that is not likely to be easily available or reliable. Even establishment of fixed emission limit values not based on use of best available techniques would require similar information on economic and technical viability.

→ **Reduced scope for regulatory capture.** Regulatory capture occurs when some individuals or groups bias the incentives of regulators and

governments to act in their interest rather than the broader public interest. Lower information requirements of market-based instruments mean less opportunity for regulatory capture and less unnecessary distortion to how resources are allocated.

4.10 Extending IPPC light touch requirements to CRC participants is an effective way of dealing with the overlap in directly targeted emissions between IPPC and CRC. As long as the emissions cap for CRC is set sufficiently stringently so as to incorporate emissions reductions achieved through IPPC energy efficiency requirements, such a move is likely to reduce overall regulatory burden without significantly affecting the environmental outcome.

4.11 Inconsistency in defining scheme boundaries across instruments (as discussed under recommendation 5) complicates the application of IPPC light touch measures to overlapping instruments such as EU ETS and CRC, and reduces some of the benefits (greater economic efficiency and lower administrative burden) of such simplification measures. For example, the definition of a combustion installation under EU ETS is narrower than under IPPC, and so extending light touch measures to EU ETS installations has resulted in operators having to install separate sub-meters to meet IPPC energy efficiency requirements for site emissions not covered by EU ETS.

Recommendation 10: Extending IPPC light touch measures to CRC (subject to a sound legal basis) and disapplying all IPPC energy efficiency requirements from EU ETS installations. Implementing this recommendation will require consideration of ways to simplify and align Pollution Prevention and Control scheme boundaries with EU ETS and CRC so benefits of the light touch measures are not lost, and also detailed analysis to ensure that removal of IPPC energy efficiency requirements will not significantly affect the environmental outcome.

Overlap with other types of instruments

4.12 Other instruments that overlap with EU ETS, CCAs, and CRC are discussed below. They are broadly categorised into four groups, instruments that

- specify the use of certain technologies;
- provide incentives for the adoption of certain types of technologies;
- target emissions other than carbon dioxide; and
- have conflicting objectives to climate change policies.

4.13 Specifying the use of certain technologies. The Renewables Obligation requires licensed electricity suppliers to source a specific and annually increasing percentage of electricity from renewable sources. The target was 6.7% for 2006-07, rising to 15.4% by 2015-16. In March 2007, a new EU renewables target was agreed – 20% of overall energy needs are to be met from renewable sources by 2020.

4.14 Such requirements restrict flexibility and limit the efficiency benefits of trading schemes such as EU ETS. Energy suppliers are required to source a fixed proportion of energy from renewable sources even though it might not be the most cost effective means of reducing emissions. Such interventions interfere with the functioning of trading mechanisms and their ability to seek out the most cost effective reductions, creating an efficiency loss for the economy.

4.15 While these policies reduce the cost effectiveness of UK's climate change policy portfolio in the short-term, they have the potential to reduce abatement costs and improve the cost effectiveness of climate policy in the long-term, by increasing investment in R&D and by overcoming barriers to diffusion. In considering such policies, the potential long-term benefits need to be explicitly recognised and balanced against the efficiency loss to the economy in the short-term.

4.16 Providing incentives for the adoption of certain types of technologies. Another category of instruments provides incentives for the adoption of certain types or suites of technologies that improve energy efficiency. Examples include the Combined Heat and Power (CHP) policy that exempts CHP technologies from the climate change levy, and the renewables policy that provides financial support for investment in renewables technologies.

4.17 Unlike the Renewables Obligation, such interventions do not directly affect the efficiency of trading schemes such as EU ETS. However, by supporting certain technologies, these instruments reduce the cost of these technologies relative to others. There is no obvious efficiency loss from such policies as long as they target established market failures in the development and diffusion of these technologies.

4.18 However, there are significant uncertainties around the exact level of support required to overcome the market failure. Any distortion to relative prices/costs beyond correcting for a market failure leads to an efficiency loss for the economy, and needs to be balanced against the potential benefits of such policies in encouraging investment in low carbon technologies and in reducing abatement costs in the long-term.

4.19 Design of such policies is critical to maximising the benefits accruing from them. In the case of CHP policies, measures to support the growth of CHP capacity include fiscal incentives, grant support, changes to the existing regulatory framework, promotion of innovation, and government/public sector leadership in using CHP electricity. These measures overlap with existing climate change instruments such as EU ETS, CCAs, and CRC, and understanding their interaction with these instruments is important for ensuring that the government's CHP target is achieved in a cost effective manner. Consistent application of CHP policy across the suite of existing climate change instruments could maximise the benefits of these policies and allow more effective delivery of UK's long-term climate change goals.

4.20 Targeting emissions other than carbon dioxide. Policies such as the Large Combustion Plant Directive have different objectives, targeting sulphur dioxide, oxides of nitrogen, and fine dust particles from combustion plants. New combustion plants must meet the emission limit values specified in the directive. Member states can choose to make existing plants⁴⁵ meet directive obligations either by (i) complying with emission limit values for NO_x, SO₂, and particles or (ii) by operating within a National Emission Reduction Plan under which each participating plant has a tradable annual mass emission allowance. The UK National Emission Reduction Plan is expected to start in January 2008.⁴⁶

4.21 As discussed in the context of IPPC, specifying emission limit values for new combustion plants is likely to be less cost effective than including them under a cap-and-trade scheme like the National Emission Reduction Plan.

4.22 Studies indicate that there are likely co-benefits from having CO₂ and NO_x/SO₂ policies. Martinez and Neuhoff (2005)⁴⁷ find that the combined impact of EU ETS⁴⁸ and the National Emission Reduction Plan implementation has a larger impact on CO₂ and SO₂ emissions than either of the two policies alone.

4.23 Differences between CO₂, NO_x, and SO₂ in terms of their environmental impact (for example, in terms of their effect on local air quality) can justify the need for separate instruments, for example, EU ETS/CRC for CO₂ and National Emission Reduction Plan for NO_x/SO₂. However, the co-benefits need to be properly analysed and accounted for when designing the instruments; for example, in cap-setting for EU ETS and the National Emission Reduction Plan.

⁴⁵ i.e. those in operation pre-1987

⁴⁶ Regulations governing the operation of the NERP were finalised in September 2007, and regulators are currently finalising guidance in preparation for the start of the scheme.

⁴⁷ Martinez, K. K., and K. Neuhoff, 2005. Allocation of carbon emission certificates in the power sector: how generators profit from grandfathered rights, *Climate Change Policy* 5: 61-78.

⁴⁸ at €10/tCO₂ and €20/tCO₂

4.24 Having conflicting objectives to climate change policies. Directives such as the Volatile Organic Compounds and Waste Incineration Directives that are implemented under the Pollution Prevention and Control regulations sometimes set requirements and create incentives which are inconsistent with carbon reduction objectives.

4.25 For example, the Volatile Organic Compounds Solvents Directive⁴⁹, which falls under Part B of the Pollution Prevention and Control regulations, sets limits for emissions of volatile organic compounds. High ventilation rates and high temperatures (achieved, for example, through thermal abatement plants) are two effective methods for removing volatile organic compounds. However, these techniques are energy intensive, and they may therefore be inconsistent with CCA or EU ETS targets. Another potential inconsistency is with the Waste Incineration Directive, under which operators are constrained in recovering energy from suitable by-products as these are currently classified as waste and transported away to landfill.

4.26 Such inconsistency between climate change and other environmental objectives can increase the regulatory burden of organisations dealing with multiple instruments with different objectives, and make any long term investment decisions more difficult.

⁴⁹ The Volatile Organic Compounds Solvents Directive is the main policy instrument for the reduction of industrial emissions of volatile organic compounds in the European Community. It covers a wide range of solvent-using activities, for example, printing, surface cleaning, vehicle coating, dry cleaning, and manufacture of footwear and pharmaceutical products. The directive establishes emission limit values for volatile organic compounds in waste gases and maximum levels for fugitive emissions (expressed as percentage of solvent input) for solvent using operators.

5. Conclusion and areas for future work

5.1 The paper identifies a number of areas of overlap between EU ETS, CCAs, and CRC and suggests some options for dealing with the overlap that lower the administrative burden without compromising the environmental effectiveness of the policies. It also identifies other ways in which the administrative burden of these instruments could be reduced.

5.2 The paper also highlights broad categories of interaction between EU ETS, CCAs, and CRC and other policies that affect the level of carbon dioxide being emitted, along with general principles for dealing with these interactions. It discusses the overlap of these three instruments with IPPC in some detail, but only touches on areas of interaction with other policies. However, these interactions need to be considered in more detail when developing domestic policy to tackle climate change in tandem with EU policies and directives.

5.3 Suggested areas for future work include:

→ **Overlap of CHP policies with other instruments.** Given its complexity, a thorough analysis of CHP policies and their interaction with other instruments was not possible in this review. However, this remains a potential area for simplification, and a review of these policies in the context of the broader climate change policy is recommended. This would help ensure that the government's approach to CHP technologies is consistent across instruments and that the CHP target is being achieved in a cost effective and efficient manner.

→ **Alignment of Pollution Prevention and Control requirements with climate change objectives.** Analysis of directives implemented through the Pollution Prevention and Control regulations whose objectives and requirements appear to be in conflict with climate change objectives is recommended. Areas of overlap need to be defined and incentives for each scheme need to be examined, with a

view to resolving the conflict where possible and to suggesting principles for dealing with the conflict where it cannot be resolved completely.

Recommendation 11: Undertaking further analysis to examine (i) the interaction of CHP policies with other instruments and (ii) the potential for greater alignment of Pollution Prevention and Control's other objectives with climate change objectives.

Appendix A: EU Emissions Trading Scheme

A.1 Description. The EU ETS is a cap-and-trade scheme introduced in 2005 to tackle greenhouse gas⁵⁰ emissions from EU member states. The scheme currently targets only direct carbon dioxide emissions, although it is likely that the scheme will be expanded to other gases from Phase III (2013) onwards. From Phase II (2008), operators will be able to use credits from projects in developing countries – some of which are non-CO₂ – for compliance purposes, although there is a limit on the number they can surrender.

A.2 The intent of government intervention, be it taxes, trading mechanisms, or direct regulation, is to correct for the externality or market failure associated with GHG emissions, namely emitters not paying the full economic and social cost of emitting greenhouse gases into the atmosphere. As climate change is a global problem – both in terms of its causes and its consequences – action at the international level has clear economic efficiency benefits. Trans-national schemes such as the EU ETS establish a common carbon price and allow emissions reductions to be made where they are most cost effective, unconstrained by national boundaries.

A.3 The EU ETS requires member states to cap emissions from installations covered by the scheme and to allocate emissions allowances (or the right to emit) among them.⁵¹ The UK uses a two stage allocation methodology, where the total number of allowances is divided between sectors on the basis of projected emissions, and the sector totals are then distributed to installations on the basis of historic emissions of individual installations during the 1998-2003 baseline period. Some allowances have been reserved for new entrants.

⁵⁰ Greenhouse gases refer to carbon dioxide, methane, nitrous oxide, and three groups of fluorinated gases (sulphur hexafluoride, HFCs, and PFCs).

⁵¹ Up to 5% of allowances in Phase I and 10% in Phase II can be auctioned or otherwise sold, but the rest must be allocated free of charge.

A.4 The cap on emissions and the allocation methodology is set out in each member state's National Allocation Plan (NAP). NAPs are agreed based on member states' progress towards meeting EU (Kyoto) and domestic greenhouse gas reduction targets.⁵²

A.5 Installations are allowed to buy and sell allowances as long as they have the required number of allowances to cover their emissions for each year. An emissions trading registry (that electronically links the various national registries) records CO₂ allowances that are allocated to and held in installation accounts, annual verified emissions for installations, the movement of allowances to and from accounts, and annual compliance status of installations. The surrender of an insufficient number of allowances results in financial sanctions against the installation, in addition to the installation being required to purchase allowances to cover all of its emissions. Anyone not covered by the scheme is also allowed to open an account on the registry, and buy and sell allowances.

A.6 Banking and borrowing of allowances is allowed between years within phases. Banking is also allowed between Phases I and II, conditional on reducing the Phase II cap by the number of allowances being banked. In addition, allowances can also be generated through the flexible mechanisms of the Kyoto Protocol, the Clean Development Mechanism and Joint Implementation, in both Phase I and Phase II (although there is a limit on the number of such allowances installations can use for compliance purposes).

A.7 Coverage. By June 2005, the scheme covered 11,500 energy intensive installations across the EU, representing approximately 46% of CO₂ emissions in the European Union. In the UK, the scheme covered 1062

⁵² The EU is required to make an 8% reduction in greenhouse gas emissions compared to 1990 levels by the first Kyoto Protocol commitment period (2008 to 2012). A 1998 burden sharing agreement among member states on apportioning the 8% cut resulted in the UK having to reduce emissions by 12.5% by 2012.

installations at the start of Phase I (2005-07)⁵³ and 923 installations at the start of Phase II (2008-12)⁵⁴.

Table A1: Activities included in EU ETS⁵⁵

Energy activities
Combustion installations with a rated thermal input exceeding 20 MW (except hazardous or municipal waste installations) Mineral oil refineries Coke ovens
Production and processing of ferrous metals
Metal ore (including sulphide ore) roasting or sintering installations Installations for the production of pig iron or steel (primary or secondary fusion) including continuous casting, with a capacity exceeding 2.5 tonnes per hour
Mineral industry
Installations for the production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or lime in rotary kilns with a production capacity exceeding 50 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day Installations for the manufacture of glass including glass fibre with a melting capacity exceeding 20 tonnes per day Installations for the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain, with a production capacity exceeding 75 tonnes per day, and/or with a kiln capacity exceeding 4 m ³ and with a setting density per kiln exceeding 300 kg/m ³
Other activities
Industrial plants for the production of - pulp from timber or other fibrous materials - paper and board with a production capacity exceeding 20 tonnes per day

Source: EU ETS Directive

⁵³ In Phase I, 388 installations covered by CCAs and the UK ETS were opted out bringing the total number of participants to 674. These installations are included in Phase II.

⁵⁴ The number of participants has changed between phases due to new entrants, closures, the inclusion of additional installations following expansion and the removal of 126 installations following application of a de minimis rule.

⁵⁵ Only direct carbon dioxide emissions from these activities are covered.

A.8 EU ETS covers electricity generation and the main energy intensive industries (see Table A1 above). In Phase II, projected emissions are approximately 275 MtCO₂ (with a cap of 246 MtCO₂), or 52% of the UK's CO₂ emissions. Approximately 50% of the emissions targeted are from electricity producers.

A.9 EU ETS coverage overlaps with CCAs and CRC in the following ways.

- EU ETS overlaps with CCAs in terms of emissions directly targeted by each instrument. The overlap area is estimated to be 41.1 MtCO₂. The most common case for EU ETS/CCA overlap is fossil fuel emissions, although more complex overlaps also exist. There are approximately 500 installations whose direct emissions are covered by both CCAs and EU ETS.⁵⁶ Of these 500 installations, 331 have been granted temporary exclusion certificates from Phase I of EU ETS. There are no similar exclusion provisions for Phase II.
- There are also a significant number of installations targeted by both EU ETS and CCAs, albeit with each instrument targeting separate emissions. There is also some overlap in organisations targeted by CRC; approximately 250 organisations in CRC have emissions in EU ETS.
- EU ETS covers upstream (direct) emissions, including from electricity production. To the extent that electricity producers pass on the cost of EU ETS allowances to their consumers, coverage of EU ETS will overlap with downstream instruments, such as CCAs and CRC, targeting indirect (electricity) emissions.

A.10 In December 2006, the European Commission adopted a proposal to include aviation in the EU ETS. The EU ETS directive is currently under review, and the Commission is exploring the possibility of further expanding the scheme to cover other gases and sectors.

⁵⁶ Climate Change Agreements – Results of the Second Target Period Assessment, Future Energy Solutions, July 2005.

A.11 Monitoring, Reporting and Verification (MRV). The MRV requirements of EU ETS are relatively stringent and require substantial administrative effort. The EU ETS works on a tier system – the top tier requires on-site analysis of fuel and monitoring equipment to be calibrated to recognised international standards, with lower tiers becoming less stringent. Participants need to justify why they are not operating at the highest tier.

A.12 Annual MRV requirements include:

- By March 31, installations must verify and submit their annual emission report for the previous calendar year to the regulator and enter the figure into their registry account (this figure needs to be confirmed by the verifier); the report contains the annual emission figure and the verification opinion statement.
- Before April 30, installations must surrender the equivalent number of allowances to the figure inputted into their registry account.
- By June 30, installations must submit an improvement report justifying why the highest levels of MRV can not be met (if they are not), and describing the operator's proposals for implementing any improvements (verifier recommended or otherwise).

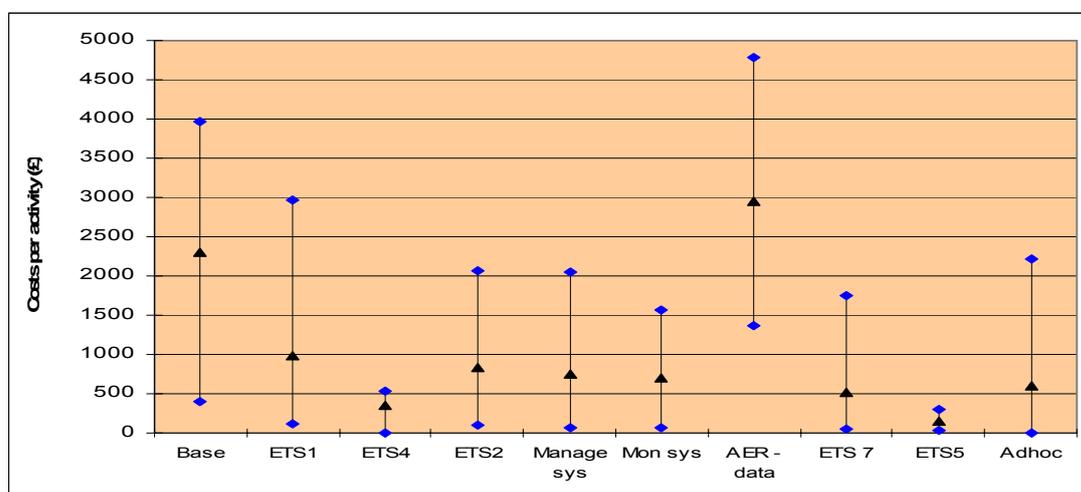
A.13 In addition, installations included in EU ETS were required to obtain independent verification of their historical baseline emissions data by an accredited verifier. These data are then used to determine allocations for the UK's Phase I and II NAPs. Allocation in future phases is unlikely to be based on historical emissions and the need for verification of installation-specific data is unclear at present.

A.14 For emissions also covered by IPPC energy efficiency requirements, EU ETS installations are required to only meet some basic (mainly reporting) requirements. IPPC establishes emission limit values for a range of pollutants based on use of best available techniques. In comparison, EU ETS provides a more cost effective and flexible way for installations to meet their IPPC energy efficiency requirements – they can either reduce their own emissions

or buy reductions from sources that are able to reduce emissions at a lower cost.

A.15 Administrative Burden. A 2006 review⁵⁷ of Phase I indicates that EU ETS verification requirements – for the annual reporting of CO₂ emissions and the provision of data for the National Allocation Plan – impose the most significant administrative costs. Verification requires an independent assessment, carried out by an accredited verification body, of the monitoring methods, information, data, and calculations used to compile annual emissions reports and baseline historical emissions data submitted by EU ETS operators. The use and maintenance of management and monitoring systems to ensure precise measurement of emissions is the next most significant aspect of EU ETS MRV requirements. Chart A1 illustrates the annual operational costs associated with the various MRV requirements of EU ETS.⁵⁸

Chart A1: Reported annual operational costs per EU ETS activity – mean value, 90th percentile, and 10th percentile



Source: 2006 AEA Technology summary report

⁵⁷ Costs of Compliance with the EU Emissions Trading Scheme, AEA Technology study commissioned by the Environment Agency, Summary Report, June 2006.

⁵⁸ The data are based on responses received from 37 operators (representing a total of 63 UK installations) following a questionnaire sent to EU ETS participants as part of the 2006 AEAT study. However, due to the small sample size (< 10% coverage of installations), these data are meant to be illustrative rather than indicative of actual administrative costs.

A.16 The administrative burden of EU ETS is not proportional across emitters of different sizes. Small emitters are found to face disproportionately high administrative costs of complying with the EU ETS MRV requirements (see Table A2 below).

Table A2: Administrative costs by size of installation (by emissions level)

Installation size (in kilo tonnes of CO ₂)	Sample size	Annual operational costs (excluding one-off and voluntary costs)	
		Average cost (£) per tonne of CO ₂	Cost (£) per tonne of CO ₂ (with fees)
< 10	38	0.76 – 2.04	1.08 – 2.77
Between 10 and 25	6	0.25	0.41
> 50	4	≤ 0.01	≤ 0.03

Source: 2006 AEA Technology summary report

A.17 Administrative burden of the EU ETS was also estimated using the standard cost model.⁵⁹ The total administrative burden of complying with the administrative requirements of EU ETS in 2005 was approximately £173,000 (for England and Wales). Of this, approximately 27% related to the monitoring and reporting of emissions, amounting to under £100 per installation. These figures are significantly lower than those reported in the 2006 AEA Technology report.

A.18 Following the introduction of NAP regulations, total administrative burden on business of developing the UK NAPs for Phase I was estimated to be £4.2 million.⁶⁰ Administrative requirements of the NAP are estimated to be £2,000-5,000 for small firms and £6,000-14,000 for larger emitters. In 2005, there were approximately 700 installations (excluding opted out installations) – 426 small emitters (<25,000 tonnes of CO₂ per year) and 267 large emitters, resulting in average administrative costs of £4,161,000 per year. The cost to government was also substantial.

⁵⁹ PriceWaterhouseCooper, as part of a cross-Whitehall exercise, estimated the cost of the administrative burden Defra's regulations place on business. Total administrative burden is estimated as total costs of the regulation less business as usual costs.

⁶⁰ This was estimated independent of the PwC administrative burden costing, as NAP regulations were introduced after the PwC exercise.

Appendix B: Climate Change Agreements

B.1 Description. CCAs are voluntary agreements between energy intensive sectors and Defra to meet challenging energy efficiency and/or emissions reduction targets. Successfully achieving these targets entitles businesses in these sectors to an 80% discount on the climate change levy. The discount is provided in recognition of the energy intensive sector's energy usage, the requirements of the IPPC regime on them, and their exposure to international competition.

B.2 In order to claim the discount, installations have to be certified by the Secretary of State as having met their CCA target milestones. CCA milestones are negotiated emission reductions from a given baseline.⁶¹ The current set of CCAs is negotiated through 2013, and is expected to reduce emissions by a little over 6.9 MtCO₂ per year by 2010.

B.3 CCAs are generally structured in one of two ways:

- an umbrella agreement between Defra and the sector association and an underlying agreement between Defra and each target unit
- similar to above, but the sector retains and manages all the underlying agreements

If a sector is found to have met its adjusted target, all facilities under the umbrella agreement are certified. If a sector is found not to have met its target, information on all sub-sectors/facilities covered by the umbrella agreement are examined to determine whether individual facilities can be certified.

B.4 CCA sector targets can be in relative or absolute terms, and can be denominated in terms of energy use or carbon emitted.⁶² If more than 50% of underlying agreements with individual installations in a sector are in a

⁶¹ Baseline years vary by sector.

⁶² Acceptable currencies for sector targets are (i) an absolute carbon target (carbon emitted during the target period), (ii) an absolute energy target (energy used during the target period), (iii) a relative carbon target (carbon emitted during the target period per unit of output during that period), and (iv) a relative energy target (energy used during the target period per unit of output during that period).

particular currency, the CCA sector target is denominated in that currency. Most current CCAs are in terms of relative targets; only 5-6 sectors (out of 51) have dominant energy targets that are absolute.

B.5 Targets are agreed and assessed based on primary energy use or emissions based on that. Energy actually used in the production process is known as delivered energy, and has to be converted into primary energy that was used to produce it.⁶³ This creates an incentive for installations to not just reduce their consumption of delivered energy, but to also investigate types of delivered energy (such as renewables and CHP) that require less primary energy to produce.

B.6 Target units⁶⁴ in CCAs are allowed to buy and sell allowances in the UK Emissions Trading Scheme (UK ETS). The UK ETS for direct participants ended in 2006, but still continues for CCA participants (refer to Appendix D for a description of the UK ETS). They can buy allowances to help comply with their CCA milestones. They can also convert any over-achievement (subject to independent verification) into CO₂ allowances, either to be sold or banked against future targets. Facilities can also ring-fence any over-achievement so that it is not used to make up sector-level shortfall, and convert the over-achievement into allowances at the end of the UK ETS verification process.

B.7 Agreed targets (sector or target unit) can be adjusted to account for the entry and exit of facilities, emissions trading/ring-fencing, and fall in output by more than 10% for sectors/target units with absolute targets. In addition, CCAs operators can claim relevant constraints as preventing them from meeting their target.⁶⁵ Operators claiming relevant constraints need to meet certain qualitative requirements.⁶⁶ Increased energy use due to an

⁶³ For example, electricity used by an installation (delivered energy) has to be converted into the amount of energy used by power stations to produce it (primary energy).

⁶⁴ A group of facilities that share a single target is defined as a target unit.

⁶⁵ Relevant constraints apply at the target unit level and compensate for various circumstances outside the operator's control where government requirements have led to an increase in energy consumption.

⁶⁶ These include preparation and implementation of an energy plan, systems for monitoring and control, production of management reports on energy use and management, and regular reviews of the energy plan and its implementation.

unforeseen disruption in supplies can also be exempted, and not counted against the target.

B.8 Coverage. An energy intensive sector is defined as one which carries out activities which are listed under Part A(1) or A(2) headings in Part 1 of Schedule 1 to the Pollution Prevention and Control (England and Wales) Regulations.⁶⁷ Since 2006, sectors can also qualify for CCAs based on their relative energy intensity and international competitiveness, specifically sectors with

- energy intensity⁶⁸ > 10%; or
- energy intensity \geq 3%, and import penetration ratio \geq 50%.

Separate facilities on the same site, each qualifying under IPPC (Part A(1) or A(2) activities mentioned above) and the energy intensity criteria, can be included in a single agreement, sharing a single target. In instances where energy intensive installations account for 90% or more of a site's energy use, the entire site is eligible to be covered by CCAs (the 90/10 rule).⁶⁹

B.9 CCAs currently apply to 51 energy-intensive sectors⁷⁰, and cover direct and indirect carbon emissions from businesses within these sectors. CCAs cover 89.5 MtCO₂, or 16% of UK's 2005 total CO₂ emissions. Of this, approximately 46% (or 41.1 MtCO₂) of emissions overlap with EU ETS, leaving 48.4 MtCO₂ as CCA-only emissions.

B.10 Defra has entered into CCAs with almost all of the eligible sectors and/or relevant sector trade associations (see Table B1 below). Current

⁶⁷ Pollution Prevention and Control thresholds are not applied except for the 50 MW combustion plant threshold and the 3MW limit for plant burning waste oil, recovered oil or fuel manufactured from or comprising waste.

⁶⁸ Energy intensity = energy costs/production value, based on the average energy cost and production values for three consecutive years.

⁶⁹ Where less than 90% of a site's energy is used within the energy-intensive installation, the whole site would not be eligible to be covered by a CCA. In this case, a facility would need to be defined such that at least 90% of the metered energy is used within the energy-intensive installation. This energy would need to be metered separately from the rest of the site.

⁷⁰ Including ten major energy intensive sectors: aluminium, cement, ceramics, chemicals, food & drink, foundries, glass, non-ferrous metals, paper, and steel.

agreements cover 4,336 target units (or over 8,750 facilities), and have been negotiated through 2013.⁷¹

Table B1: CCA sectors, target units, and facilities*

	Sector	Target units	Facilities
1	Aerospace	23	29
2	Agricultural Supply	137	145
3	Aluminium	50	51
4	Apparel and Textiles	100	100
5	Brewing	48	50
6	Calcium Carbonate	6	14
7	Cement	5	17
8	Ceramics	114	191
9	Chemicals	234	258
10	Cleveland Potash	1	1
11	Coldstores	1	1
12	Contract Heat Treatment	49	49
13	Craft Baking	299	2700
14	Dairy	101	117
15	Egg Processing	8	8
16	Egg Production	142	213
17	Food & Drink - Supermarkets	5	531
18	Food and Drink	830	923
19	Foundries	174	184
20	Geosynthetics	2	2
21	Glass	25	39
22	Gypsum Products	4	7
23	Horticulture	121	155
24	Industrial Gases	8	12
25	Kaolin and Ball Clay	5	14
26	Leather	9	9
27	Lime	8	14
28	Malting	21	28
29	Metal Forming	83	83
30	Metal Packaging	22	24
31	Mineral wool producers	6	6
32	Motor manufacturers	25	26
33	New Rubber Tyre Manufacturing	6	8
34	Non-Ferrous Metals	75	100
35	Packaging and Industrial Films	16	16
36	Paper	62	62
37	Pig Farming	297	362
38	Poultry Meat Processing	63	63
39	Poultry Meat Production (NFU)	359	369
40	Poultry Meat Rearing (BPMF)	159	1011
41	Printing	150	150
42	Red Meat Processing	155	188
43	Renderers	13	19

⁷¹ State aid approval required for final certification period from April 1, 2011 to March 31, 2013. State aid approval is required from the European Commission in order to allow CCA participants to claim a discount on the climate change levy.

	Sector	Target units	Facilities
44	Semi-conductor manufacture	28	29
45	Slag grinding	6	6
46	Spirits	25	65
47	Steel	21	47
48	Surface Engineering	202	221
49	Textiles (Energy Intensive)	12	12
50	Wallcovering	11	11
51	Wood panel manufacture	10	10
TOTAL		4336	8750

*Target period 3 (2006)

B.11 CCA coverage overlaps with EU ETS and CRC in the following ways.

- CCAs overlap with EU ETS in terms of emissions directly targeted by each instrument. The overlap area is estimated to be 41.1 MtCO₂. The most common case for EU ETS/CCA overlap is fossil fuel emissions, although more complex overlaps also exist. Participation in CCAs has allowed some installations to be temporarily excluded from Phase I of EU ETS. There are approximately 500 installations whose direct emissions are covered by both CCAs and EU ETS.⁷² Of these 500 installations, 331 have been granted temporary exclusion certificates from Phase I of the EU ETS. There are no similar exclusion provisions for Phase II (2008-12).
- There are also a significant number of installations targeted by both EU ETS and CCAs, albeit with each instrument targeting separate emissions. There is also some overlap (a small number of organisations) with CRC.
- EU ETS covers upstream (direct) emissions, including from electricity production. To the extent that electricity producers pass on the cost of EU ETS allowances to their consumers, coverage of EU ETS will overlap with downstream instruments, such as CCAs and CRC, targeting indirect (electricity) emissions.

B.12 Monitoring, Reporting, and Verification (MRV). Entering into a CCA places an obligation on each company to register its facilities and monitor their

⁷² Climate Change Agreements – Results of the Second Target Period Assessment, Future Energy Solutions, July 2005.

performance throughout the duration of the agreement. Given the structure of current CCAs, MRV requirements are two-stage:

- operators supply relevant information to sector associations; and
- sector associations collect and present this information to DEFRA.

B.13 Information to be submitted by operators includes

- units of energy used/units of carbon emitted;
- total output for the target period;
- all information necessary to calculate any target adjustments (for example, because of entry and exit, emissions trading);
- details of relevant constraints being claimed as preventing the operator from meeting the target (including the operator's energy plan and steps being taken to implement it);
- Combined Heat and Power feasibility studies (if applicable), and
- evidence of compliance with the 90/10 rule (if applicable).

Sector associations use the information submitted by operators to arrive at adjusted sector-level targets and primary energy use/carbon emitted by the sector.

B.14 In addition, installations with directly targeted emissions that overlap with EU ETS are required to comply with CCA double counting rules. Double counting occurs when the same emissions decrease (increase) results in the installation benefiting (being penalised) under both schemes.⁷³ Given that EU ETS and UK ETS allowances are not interchangeable, CCA targets are corrected to account for any EU ETS allowances bought, sold, or banked – if there is a surplus of the annual allocation of EU ETS allowances the target is tightened, and if there is a shortfall in the annual allocation of EU ETS allowances the CCA target is eased. CCA performance is compared to the corrected target and allowances are then bought or sold on the UK ETS, as

⁷³ For example, emissions reductions that result in surplus EU ETS allowances could also result in over-achievement of CCA targets, which could then be converted into UK ETS allowances. The operator would be gaining allowances on both trading schemes for the same reduction.

required to meet CCA targets.⁷⁴ If an operator chooses to retire surplus EU ETS allowances, the CCA target remains unchanged.

B.15 Information is to be submitted bi-annually, at the end of every even year starting in 2002. If targets are determined as being achieved, operators are certified and eligible for the climate change levy discount for the following two-year certification period.⁷⁵ Data submitted is generally for the period October 1-September 30 immediately preceding the submission date.

B.16 As part of the certification process, the department undertakes independent (random) verification checks of a sample of companies' data to ensure that it is accurate.⁷⁶ Participants are, therefore, required to keep adequate records for audit purposes, and ensure that measurement and reporting systems are robust. The department provides guidance for sector associations and operators on producing accurate data and preparing for audit.

B.17 Installations that are successful in meeting their CCA targets are only required to meet some basic (mainly reporting) requirements in order to comply with IPPC energy efficiency requirements. IPPC establishes emission limit values for a range of pollutants based on use of best available techniques. In comparison, CCAs with their trading component provide a more cost effective and flexible way for installations to meet their IPPC energy efficiency requirements – they can either reduce their own emissions or buy reductions from sources that are able to reduce emissions at a lower cost.

⁷⁴ Methodology for avoiding double counting is set out in CCA23: Avoiding Double Counting Between CCA and EU ETS.

⁷⁵ April 1, 2001 to March 31, 2003 was the first certification period. April 1, 2011 to March 31, 2013 is the final certification period, with reconciliation and eligibility for the climate change levy discount being determined in late-2010/early 2011.

⁷⁶ Independently verified data will not be subject to a site-level audit, except to confirm eligibility of the process. Data are required to be verified if target units intend to trade in UK ETS allowances.

B.18 Administrative burden. CCAs are a voluntary instrument. However, CCA MRV requirements impose an administrative burden on sectors⁷⁷ and target units entering into these agreements.

B.19 The MRV requirements of CCAs are generally found to be less burdensome than EU ETS and UK ETS. Independent verification of data and results is not mandatory for all CCA participants, it is only required for organisations that trade in UK ETS allowances. In addition, group verification facilitated by sector associations is believed to have reduced the administrative burden on individual participants, and to have encouraged the participation of smaller firms.

B.20 However, where required, independent verification is one of the more burdensome aspects of CCAs. For sectors choosing to have their data independently verified, Enviro (which represents 14 of the 51 sectors with CCAs) estimates the cost of verification for CCA participants to vary between £1,500 and £5,000 based on volume and complexity.⁷⁸ In addition, determining whether energy use at a particular site is eligible for the CCL discount is also found to be complicated.

B.21 Annual fees charged by sector associations for scheme coordination (i.e., collection and checking of data, form filling, and filing) depend on the size and number of sites, but the average is estimated around £300 per site.⁷⁹

⁷⁷ In turn, sector associations may pass through these costs to operators in their sector by charging for their services; for example, through membership fees.

⁷⁸ Appraisal of Years 1-4 of the UK Emissions Trading Scheme, 2006. A report prepared for the Department for Environment, Food and Rural Affairs by Enviro Consulting Limited.

⁷⁹ Energy Efficiency and Trading Part II: Options for the Implementation of a New Mandatory UK Emissions Trading Scheme, 2006. A report prepared by NERA Economic Consulting and Enviro Consulting for Defra.

Appendix C: Carbon Reduction Commitment

C.1 Description: The CRC is a new mandatory cap-and-trade scheme to reduce carbon emissions (direct CO₂ and indirect CO₂) from the large non-energy intensive business and public sectors. The scheme is expected to begin in January 2010.

C.2 A 2005 Carbon Trust report⁸⁰ concluded that there were significant opportunities for cost effective emissions reductions in the business and public sectors, based solely on the use of existing commercially available technology. The report concludes that outside the energy-intensive sector, the largest potential for cost-effective abatement lies in buildings-related energy use.⁸¹

C.3 The commercial sector, the public sector, and manufacturing industry together produced 198 MtCO₂ in 2002. Of this, large non-energy intensive industries were responsible for approximately 25% of emissions, and the public sector for another 10%. In addition, these sectors are expected to grow rapidly over the next few decades. Recent projections indicate that, without further measures, there is likely to be a steady rise in carbon emissions from the service sector; energy demand and carbon emissions from the sector are expected to grow by 18% and 22% between 2010 and 2050, respectively.⁸² Meeting UK's emissions reduction goals will require realising the emissions reduction opportunities that exist within the large non-energy intensive business and public sectors. CRC is expected to deliver emissions reductions of 4.0 MtCO₂ per year by 2020.⁸³

C.4 Relying solely on price signals (for example, higher electricity prices due to EU ETS) is not likely to be sufficient to unlock the potential for cost

⁸⁰ The UK Climate Change Programme: Potential Evolution for Business and the Public Sector. The Carbon Trust, 2006.

⁸¹ Buildings-related emissions account for at least two-thirds of emissions outside the energy-intensive sector.

⁸² UK Energy and CO₂ Emissions Projections, June 2006. Department of Trade and Industry.

⁸³ The government retains its commitment to achieving emissions reductions of 4.4MtCO₂ per year from the large non-energy intensive sector. The Energy Performance for Buildings Directive is expected to deliver an additional 0.4MtCO₂ per year from this sector.

effective carbon savings. There are a number of sector-specific reasons for the low uptake of energy efficiency measures in this sector. For example,

- organisational market failures (internal split incentives) and inertia;
- organisations not receiving the full benefits accruing from energy saving measures undertaken by them (split incentives, free rider problem, difference between private and social rates of return); and
- asymmetric information and information failures regarding costs and benefits that are real, but may not be captured directly in financial flows (hidden costs/risks, intangible benefits).

The incentive to overcome these market failures is low as energy costs typically form a small percentage of total operating costs (for example, energy costs are typically around 1-3% of total operating costs for CRC target organisations).

C.5 CRC is intended to address some of these downstream market failures. The cap in successive periods is to be set such that the required emissions reductions are delivered by 2020, with allowances being auctioned and revenues being recycled to CRC participants. Based on an analysis of various options for revenue recycling⁸⁴, the government has decided to recycle auction revenue by means of direct grant payments proportional to the organisation's average annual emissions since the start of the scheme. A bonus or penalty will also be awarded based on the organisation's performance ranking in the CRC league table. Performance ranking would be based on the organisation's percentage emissions reduction relative to its average annual emissions, and possibly on other metrics such as pro-activeness⁸⁵ and metrics to take account of organisational growth. The government has committed to consult further on the design of the league table.

⁸⁴ Options considered included no revenue recycling, a discount on national insurance, a recycling formula linked to firm size (specifically, to the number of employees), a recycling formula linked to energy performance, a targeted fund or rebate, and classification of auctioned allowances as a tax deductible business expense against corporation tax.

⁸⁵ For example, as measured by the roll-out of automatic metering above and beyond the legal minimum.

C.6 The proposed CRC also features a “buy only” link (safety valve) to the EU ETS/international (Clean Development Mechanism/Joint Implementation) carbon markets. CRC organisations would have the option of buying allowances from the EU ETS market to make up for a shortfall in allowances, but would not be able to sell CRC allowances into the EU ETS market. This would effectively place a ceiling on the CRC allowance price and prevent price spikes.

C.7 Allowing surplus allowances to be banked is also being considered to smooth out price fluctuations in the CRC market, encourage early action, and provide organisations with the flexibility to distribute their emission reduction effort over time to minimise cost.

C.8 Coverage. CRC targets direct CO₂ energy and indirect CO₂ (electricity) emissions from large non-energy intensive organisations outside the EU ETS and CCAs.

C.9 The scheme would be restricted to organisations whose electricity use is monitored through mandatory half-hourly meters.⁸⁶ It is worth noting that all energy consumption at such organisations (not just energy consumption as monitored by half-hourly meters) will be included in CRC, subject to de minimus rules to be determined through further consultation. It is estimated that there are currently in excess of 100,000 half-hourly electricity meters owned by around 27,000 organisations in the UK.

C.10 The scheme would be further restricted to organisations whose mandatory half hourly metered electricity use exceeds a consumption threshold of 6,000 MWh per year; this equates roughly to organisations with an annual electricity bill of over £500,000. With the mandatory half-hourly meter requirement and the 6,000 MWh threshold, it is estimated that 4,000-5,000 organisations will be covered by CRC (see Table C1 below). It is

⁸⁶ Half-hourly meters are mandatory at sites where peak electricity consumption is in excess of 100 kW for three consecutive months over a 12-month period, which translates approximately to a minimum electricity consumption of about 250 MWh, or a bill on the order of £15,000 per annum.

expected that most of the target organisations will be in the service and public sectors, but the proposal will also cover some light manufacturing sectors that are not party to CCAs.

Table C1: CRC coverage, by sub-sector for alternative inclusion thresholds*

Threshold	3000 MWh	6000 MWh
Sector	Number of organisations	Number of organisations
Aggregate without sector differentiation	4895	4810
Aluminium	10	10
Automotive trade	53	53
Chemicals	76	69
Construction	12	7
Education	124	74
Elec Engineering	66	31
Energy processing	-	-
Estate & business	317	308
Food & drink	28	20
Glass	1	1
Health & social	100	58
Hotels and Restaurants	26	23
Mech Engineering	1181	1066
Paper & board	89	67
Plastics	300	259
Printing	-	-
Public sector	501	168
Retail	128	109
Steel	46	45
Textiles	-	-
Transport, storage & comms	54	33
Vehicle Engineering	24	24
Water & waste	23	23
Wholesaling	58	35
Total of differentiated sectors	3217	2483

*Aggregated estimates are more robust as the data are more reliable, and mapping onto sectors for the disaggregated analysis is imperfect

Source: NERA/Enviros report (2006)

C.11 Based on a 6,000 MWh inclusion threshold, CRC is expected to cover 52.1 MtCO₂ of emissions; in relative terms, this is a little under 10% of UK's

total CO₂ emissions in 2005. Without the inclusion threshold, 71.1 MtCO₂ of emissions would be covered.⁸⁷

C.12 In addition, the government proposes that organisations with more than 25% of their energy use emissions in CCAs will be completely exempt from the CRC. Without this exemption, there would be a substantial proportion of CRC organisations with emissions in both CCAs and CRC. It is difficult to estimate the impact of the CCA exclusion criterion on CRC emissions coverage, but it is estimated that this exemption could possibly remove up to 20% of CRC organisations.⁸⁸ The reduction is thought to be roughly equal across different organisational size categories, potentially reducing emissions coverage by 20% to 41.8 MtCO₂.

C.13 CRC overlaps with EU ETS and CCAs in the following ways.

- A small proportion of CRC organisations will have to comply with multiple instruments. Roughly 5% of the 5,000 organisations within the target sector will have some of their direct energy use emissions in EU ETS, and a small number of organisations will also have emissions in CCAs.
- EU ETS covers upstream (direct) emissions, including from electricity production. To the extent that electricity producers pass on the cost of EU ETS allowances to their consumers, coverage of EU ETS will overlap with downstream instruments, such as CCAs and CRC, targeting indirect (electricity) emissions.

There is no overlap in emissions directly targeted by CRC and those directly targeted by either EU ETS or CCAs.

⁸⁷ Energy Efficiency and Trading Part II: Options for the Implementation of a New Mandatory UK Emissions Trading Scheme, 2006. A report prepared by NERA Economic Consulting and Enviro Consulting for Defra.

⁸⁸ Based on aggregate analysis, the number of CRC organisations after application of the CCA exclusion criterion is estimated to be around 4,000.

C.14 Monitoring, Reporting, and Verification (MRV). The MRV requirements of CRC are intended to be light touch compared to the EU ETS, CCAs, and UK ETS.

- Organisations will be required to prepare an annual evidence pack, based on automatic meter reads where available, and energy bills where such meters are not in place, and report their total energy use emissions at the end of the compliance year.
- There are no verification requirements as such. Instead, participants are expected to self-certify their emissions, with the scheme regulator carrying out risk-based audits to verify compliance (20% of CRC organisations each year).

As CRC allowances are to be auctioned, there is no need for allocation plans (as with the EU ETS).

C.15 Administrative burden. CRC MRV requirements are intended to ensure that administrative costs are significantly less than under schemes such as EU ETS, CCAs, and UK ETS, with the expectation that these costs will be outweighed by the energy-savings benefits eventually delivered.

C.16 Tighter MRV requirements improve the accuracy of reported emissions, but also impose greater costs. The requirements for CRC are being developed based on lessons learned from the EU ETS, CCAs, and UK ETS (with further consultation intended). In an effort to reduce the administrative burden of the scheme, two major simplification measures are being proposed:

- establishing a minimum inclusion threshold – annual mandatory half hourly electricity consumption greater than or equal to 6,000 MWh – that is estimated to remove around 90% of the admin burden, whilst retaining around 70% of the emissions coverage; and
- developing MRV requirements based on self-certification backed by a risk based audit regime, rather than requiring on-site third party verification for each site (as in EU ETS) or requiring third party verification for each organisation (as in UK ETS).

C.17 Given that administrative costs tend to be regressive in nature, an inclusion threshold reduces the likelihood of organisations being included in CRC for whom the administrative costs of participation are greater than the benefits they could expect to achieve from the resulting energy savings. In fact, the 6,000 MWh inclusion threshold has been chosen to focus the scheme on those organisations for whom energy efficiency benefits would outweigh admin costs.

C.18 Moreover, as that data collected from half-hourly meters is of high quality (margin of error of less than 1%), its use for self-certification is likely to reduce much of the administrative burden generally associated with trading schemes.⁸⁹ The government is considering requiring energy suppliers to provide an annual statement of energy use emissions (for those bills grouped by the CRC organisation) to any CRC organisation making such a request. In the absence of half-hourly or other automatic meters, the government proposes to allow energy bills to be used for reporting total energy use during the year. Using energy use emissions statements and electricity and gas bills to self-certify annual emissions – backed by an independent risk-based audit regime – is likely to eliminate the need for third-party verification while maintaining the integrity of the MRV process and ensuring that the data being reported is of good quality.

C.19 Table C2 below provides estimates of administrative burden per tonne of CO₂ reduced.

Table C2: Administrative costs, by inclusion threshold

Threshold	3,000 MWh	6,000 MWh
Average cost (£) per tonne of CO ₂	0.6	0.46

Source: NERA/Enviros report 2006

⁸⁹ Robust monitoring and reporting are a necessary component of a successful emissions trading scheme. In the absence of half-hourly meters, MRV required to ensure data of sufficient accuracy is likely to be administratively burdensome and costly.

C.20 An assessment of various policy alternatives to tackle emissions from non-energy intensive organisations⁹⁰ determined that CRC performed better than EU ETS, CCAs, and UK ETS in terms of minimising the administrative burden, while performing as well if not better on other evaluation criteria such as coverage, promotion of energy efficiency, and extent and certainty of emission reductions.

C.21 Less stringent MRV requirements mean that CRC participants are likely to spend 2/5 or less time on compliance compared to expanding the EU ETS to cover this sector.⁹¹ The need for verification of allowance sales and other factors make the administrative burden of expanding CCAs to cover this sector approximately 25% greater than that of CRC.

⁹⁰ Comparison of Policies to Reduce Carbon Emissions in the Large Non-Energy-Intensive Sector, 2007. A report prepared by NERA Economic Consulting for Defra.

⁹¹ Approximately 14 days for single-site participants in the CRC, compared to 35 days for small/single-site installations in EU ETS.

Appendix D: Description of UK Emissions Trading Scheme

D.1 The UK Emissions Trading Scheme was the world's first economy-wide greenhouse gas emissions trading scheme. The scheme was launched in 2002, and ended for everyone other than CCA participants in 2006. It covered the six major greenhouse gases covered by the Kyoto protocol. Its main purpose was to secure cost-effective emissions reductions, give UK companies experience with emissions trading prior to the introduction of EU ETS, and encourage establishment of emissions trading centres in London.

D.2 Participation in the scheme was voluntary.

- Direct participants bid in emissions reductions in response to prices announced by Defra per tonne of CO₂ equivalent reduced. The price announced was successively lower (descending clock auction) until the total incentive payment⁹² was equal to the budget.
- CCA participants could also participate in the UK ETS – buying allowances to make up any shortfall in meeting CCA targets or selling/banking any over-achievement.
- Finally, the UK ETS was also open to other parties such as traders without compliance commitments.

D.3 The majority of allocations were awarded to direct participants based on an incentive auction (with only around 4% being awarded to CCA participants, on a baseline and credit basis). Once organisations had committed to an abatement level by 2006, annual targets were calculated linearly and the corresponding number of allowances awarded each year.

D.4 31 direct participants bid 3.96 MtCO₂e of emissions reduction in 2006 (13% lower than verified baseline emissions) for total incentive payments of £215 million. As the 2006 reductions relative to baseline (emissions between 1998 and 2000) represent one-third of the cumulative total reductions

⁹² Announced price x total number of emissions reductions bid in at the announced price

between 2002-06, this was equivalent to a cumulative reduction of 11.88 MtCO₂e over the five-year life of the scheme.⁹³

D.5 There were a little under 3,500 trades between April 2002 and March 2006, with the number of trades spiking in the run-up to CCA milestones (2002 and 2004).⁹⁴ The relatively low trading volume has been blamed on the over-allocation of allowances to direct participants, which in turn is linked to generous baseline setting and the inclusion of non-CO₂ GHGs.⁹⁵ For example, during the first two years of operation trading volume was less than 10% of the annual allocation, significantly lower than the comparable percentage for other trading schemes such as the US SO₂ market and California's Regional Clean Air Market.

D.6 Following the end of the scheme for direct participants in 2006, allocations are now made only to CCA participants, based on any verified overachievement of their CCA target. Existing allowances purchased from direct participants prior to the end of the scheme in 2006 can also be used to meet CCA milestones.

D.7 The MRV requirements included

- Direct participants calculating and verifying their baseline data
- Annual monitoring and reporting (for direct participants, all eligible sources of emissions and emissions data have to be independently verified)

D.8 Companies in the UK ETS were encouraged to have, but did not require, a monitoring and reporting plan. The verifier visited each company annually to audit the reported data and as a part of the verification process expected to see evidence of a monitoring and reporting programme.

⁹³ Review of the First and Second Years of the UK Emissions Trading Scheme, 2004. A report prepared for Department for Environment, Food and Rural Affairs by NERA Economic Consulting.

⁹⁴ Appraisal of Years 1-4 of the UK Emissions Trading Scheme, 2006. A report prepared for the Department for Environment, Food and Rural Affairs by Enviro Consulting Limited.

⁹⁵ Most direct participants were sellers, and most of the remaining were buyers.

D.9 The UK ETS, though lighter touch than EU ETS, was found to have significant administrative burdens, largely due to the independent verification requirements. A 2004 National Audit Office report⁹⁶ concluded that the total cost of verification for direct participants was around £40,000 to £50,000 for large operators and £2,500 for small (single-site) operators. Mandatory verification was not required for CCA participants, except for target units that traded in UK ETS allowances.

⁹⁶ The UK Emissions Trading Scheme: A New Way to Combat Climate Change, 2004. A report by the Comptroller and Auditor General (HC 517 Session 2003-2004).

Appendix E: Feedback from industry

E.1 This Appendix summarises the feedback received from industry at the Defra/DTI seminar on better regulation held on June 15, 2007, and written comments received since. At the seminar, the review's initial scope and direction of travel was presented to the Business Climate Change and Energy Group. The discussion that followed and written comments provided since have informed the review.⁹⁷

E.2 One emerging theme from the discussion was the need to evaluate the overlap between EU ETS, CCAs, and CRC and the IPPC, and suggest options for simplification. As a result, the scope of the review was expanded to include an analysis of IPPC energy efficiency requirements. In addition, analysis of the wider overlap between the various directives implemented through the Pollution Prevention and Control regulations whose objectives and requirements appear to be in conflict with climate change objectives has been recommended.

E.3 Other issues raised during the seminar are summarised below.

- Linking climate change levy discount to EU ETS as well to avoid the problem of double counting emissions directly targeted by CCAs and EU ETS.
- Eliminating inconsistencies in the current mix of instruments that leave some emissions unregulated.⁹⁸
- Resolving inconsistencies between the UK and EU definition of combustion.
- Evaluating the administrative burden on business from participating in a range of different auctions.
- Examining potential problems caused by the Renewables Obligation for biomass burning.

⁹⁷ Written comments were provided by the British Cement Association, the Chemical Industry Association, and the Engineering Employees' Federation, and the Society of Motor Manufacturers and Traders.

⁹⁸ Covering emissions on a consistent basis was pointed out as important to maintaining a level playing field.

- Considering indirect effects of climate change policy on sectors not directly regulated under any specific climate change instrument.

In addition, concerns were raised about waste regulations being applied with greater rigour in the UK than elsewhere in Europe and the case for exclusion of small emitters not being heard loud enough in Europe.

E.4 British Cement Association (BCA). The industry is regulated by EU ETS, CCAs, and IPPC energy efficiency requirements. Comments indicate that businesses in this sector find the climate change policy piecemeal, with overlaps that require operators to do things twice (sometimes three times) and result in higher administration costs than would be the case with an efficient policy mix.

E.5 BCA is supportive of some of the recommendations of the review, including

- removing the overlap between EU ETS and CCAs in directly targeted emissions⁹⁹; and
- aligning monitoring, reporting, and verification requirements across instruments as much as possible.¹⁰⁰

E.6 The remaining comments are summarised below.

- BCA supports the principle of emissions trading, with EU ETS seen as the cornerstone of UK policy going forward. However, concerns are raised about the potentially damaging effects of auctioning Phase III EU ETS allowances.
- BCA views CCA/CCL as having done their part, but now largely redundant for EU ETS industries. It suggests that CCA targets could

⁹⁹ Retaining both schemes results in additional verification costs as emissions must be verified under both schemes. Annual compliance and verification costs for a cement works installation under EU ETS is typically £7,000, and this increases to more than £10,000 when verification for CCAs is included. These costs exclude the man hours required by company personnel for data collection, verification, and report generation.

¹⁰⁰ Industry describes current EU ETS, CCA, and IPPC carbon dioxide reporting requirements as different under each scheme.

be limited to indirect (electricity) emissions¹⁰¹, and EU ETS compliance be allowed to claim the climate change levy discount. It praises CCAs for encouraging the recovery of energy from waste, and suggests including incinerators and landfills in EU ETS and considering EU ETS domestic fossil fuel replacement projects.

- Finally, BCA urges government support in collaborative research into carbon capture and storage options due to limited scope for further emissions reductions/energy efficiency improvements in this sector.

E.7 Chemical Industries Association (CIA). CIA highlights the need for continuity in regulatory incentives as an important driver of long-term investment. Comments submitted by the association are summarised below.

- Upstream and downstream carbon price signals are not always needed. CIA believes that the pass-through of EU ETS prices into electricity prices provides sufficient incentive for sites in energy-intensive sectors to improve their use of this energy source, and does not agree with the inclusion of indirect emissions on EU ETS sites in CRC.
- The chemical industry would prefer that the double counting mechanism set up to deal with the overlap in emissions directly targeted by EU ETS and CCAs remains at least until 2012. Following that, they support removing the double counting requirement and extending the climate change levy discount to EU ETS participants.
- CIA raises concerns about competitiveness impacts of carbon-constraining industries in the UK (and EU), by shifting to absolute targets and by auctioning EU ETS allowances, when industries elsewhere are not similarly constrained. CIA supports the use of benchmarks to maintain free allocation under Phase III of EU ETS in order to minimise competitiveness impacts.
- CIA is also concerned that instruments like the Renewables Obligation favour the use of renewable sources for energy generation over more

¹⁰¹ If there is need for an additional instrument. BCA believes that the pass through of EU ETS prices into electricity prices has already raised prices significantly, and that this is enough incentive to use energy efficiently.

downstream industrial uses, for example, using biomass to make consumer products before burning the it to generate energy.

- Finally, CIA raises concerns about interactions of climate change policies with the Waste Incineration Directive, under which UK chemical companies are prevented from recovering energy from suitable by-products, which are classed as waste and transported away to landfill.

E.8 Engineering Employees' Federation (EEF). EEF welcomes Defra's review of the interaction between climate change instruments, as the proliferation of policy instruments in this area represents a mounting regulatory burden on businesses.

E.9 EEF is supportive of any recommendations the review might make to deal with the overlap between upstream and downstream emissions. It specifically notes that businesses regulated under CRC will be affected by three overlapping regulatory regimes with respect to indirect emissions arising from their electricity consumption: the EU ETS, the CRC and the Climate Change Levy.¹⁰²

E.10 EEF also believes that the scope of the review should be expanded to include

- fiscal measures, as these measures already form part of the regulatory framework to which businesses are subjected and have the potential to play an expanded role in the future; specifically, the comments note the need for including the climate change levy within the scope of the review; and

¹⁰² Emissions associated with electricity generation are capped under the EU ETS, factored into electricity prices by energy suppliers, and passed through to consumers. Emissions associated with electricity consumption will be capped under the CRC. Finally, the electricity consumed by business is subject to the climate change levy.

- a comprehensive cost-benefit analysis of the available policy options, including the pros and cons of trading schemes such as CRC compared to various carbon tax options.¹⁰³

Finally, EEF also notes the need for further clarity on the review's time line and deliverables, in particular, whether stakeholders will have any further opportunities to comment on the findings of the review.

E.11 Society of Motor Manufacturers and Traders (SMMT). The review was discussed at the quarterly meeting of SMMT's Manufacturing Environment and Manufacturing ETS/CCL working groups, and these discussions form the basis of the comments.

E.12 The comments are supportive of some of the recommendations of the review, for example,

- including the DTI quarterly fuel return in any data sharing exercise;
- excluding small combustion units (>3MW each) from schemes such as the EU ETS on the basis of proportionality; and
- including/excluding small emissions in order to minimise the need for additional metering.¹⁰⁴

E.13 The remaining comments are summarised below.

- SMMT expressed disappointment that the overlap between EU ETS, CCAs, and CRC and the IPPC was not being considered.¹⁰⁵ Specifically, for vehicle manufacturing, IPPC and the EU ETS/CCA regimes are found, in some instances, to send opposing signals. For example, the main vehicle manufacturing activity regulated by IPPC is coating of vehicles with solvent based paints. IPPC focuses on

¹⁰³ The comments also note that there is a risk that a multi-metric 'league table' might prove overly complex and add considerably to the administrative burden of CRC. A cost-benefit analysis of this element of the scheme is recommended.

¹⁰⁴ Defining scheme boundaries on a simple and consistent basis across instrument (recommendation 5) should reduce the need for additional metering to cover relatively small emissions.

¹⁰⁵ The scope of the review has since been expanded to include an analysis of IPPC energy efficiency requirements. Analysis of the wider overlap between the various directives implemented through the Pollution Prevention and Control regulations whose objectives and requirements appear to be in conflict with climate change objectives has been recommended.

minimising emissions of volatile organic compounds (VOC) and has often driven operators to install thermal abatement plants to burn off the VOC before it is released. Significant amounts of energy are consumed in order to burn the VOC, which conflicts with the aims of EU ETS/CCAs.

- The monitoring, reporting, and verification requirements of the Combined Heat and Power Quality Assurance Programme¹⁰⁶ are found to be burdensome, and are recommended as a candidate for simplification.¹⁰⁷
- Excluding organisations with at least 25% of their emissions in CCAs from CRC could still leave some vehicle manufacturers regulated by both. SMMT believes that such organisations are better suited to be included in CCAs, and CO₂ savings from including them CCAs is likely to be greater than under CRC.
- SMMT questions the need for organisations with emissions in EU ETS to have some of their emissions also included in CRC, especially if the aim of CRC is to raise awareness at the management level and this is already being done by EU ETS.
- Under the EU ETS regime, emission factors and calorific values are only announced at the end of the reporting period, requiring data to be revisited and adjusted. SMMT believes that making this information available at the beginning of the reporting period will reduce the administrative burden of EU ETS on business.

¹⁰⁶ under which electricity produced using CHP technologies is exempt from the climate change levy.

¹⁰⁷ The review recommends a detailed analysis of CHP policies and their interaction with other instruments.

Six Consultation Criteria

- Consult widely throughout the process, allowing a minimum of 12 weeks for written consultation at least once during the development of the policy
- Be clear about what your proposals are, who may be affected, what questions are being asked and the timescale for responses
- Ensure that your consultation is clear, concise and widely accessible
- Give feedback regarding the responses received and how the consultation process influenced the policy
- Monitor your department's effectiveness at consultation , including through the use of the designated consultation co-ordinator
- Ensure your consultation follows better regulation best practice, including carrying out a Regulatory Impact Assessment if appropriate