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ILEX ENERGY
CONSULTING

THE ENVIRONMENTAL EFFECTIVENESS OF THE EU ETS:

ANALYSIS OF CAPS

A final report to WWF

Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

avanzi
idee, ricerche e progetti per la sostenibilità

ESC
EcoSolutions Consulting

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TABLE OF CONTENTS

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EXECUTIVE SUMMARY

Introduction to the project

WWF has commissioned ILEX together with a consortium of consultants[1] from across Europe to evaluate the environmental effectiveness of the EU Emissions Trading Scheme (ETS). We have focused on Phase I (2005 to 2007) and Phase II (2008 to 2012) of the scheme.

Purpose and scope of this report

The purpose of this report is to provide an independent analysis of the national allocation plans (NAPs) in six key Member States: UK, Germany, Italy, Poland, Spain and the Netherlands. This report focuses on the evaluation of the total number of allowances (or caps) allocated by different Member States[2] by:

- developing criteria against which to assess the environmental effectiveness of the EU ETS;
- evaluating the number of allowances allocated in Phase I (both in terms of the level and the way that that level was calculated);
- recommending best practice principles for setting cap levels in Phase II;
- identifying particular areas and key improvements to address to make NAPs more environmentally effective in Phase II;
- exploring options for the harmonisation of cap-setting approaches in Phase II; and
- discussing recommendations for future phases of the scheme (beyond 2012).

These six key countries were chosen since their NAPs include approximately 68% of the allowances[3] allocated under the scheme. As a result, policy decisions in these countries will have a significant impact on the environmental effectiveness of the scheme. In addition, the NAPs for these countries reflect a wide range of approaches to cap setting that has allowed us to compare and contrast a variety of options.

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1 Avanzi, EcoSolutions Consulting (ESC), ILEX Iberia, Öko-Institut.

2 A separate report 'The environmental effectiveness and economic efficiency of the European Union Emissions Trading Scheme: Structural aspects of the allocation' authored by the Öko-Institut evaluates the way that these allowances have been distributed to individual installations.

3 Allowance is the term used to describe the emissions permits that are traded in the EU ETS. Each EU allowance (EUA) equates to 1 tonne of carbon dioxide (tCO2).

Organisations involved

Five consultancies were involved throughout the course of this project: Avanzi (Italy), EcoSolutions Consulting (ESC) (Poland), ILEX (UK), ILEX Iberia (Spain), Öko-Institut (Germany). Each provided country-specific data, analysis and wider comment on the approach and findings. ILEX led the analysis and was ultimately responsible for delivering this report.

The project was funded by WWF-UK, WWF-Germany and WWF-International. The initiation of the project, preparation of draft versions and review of the final report included input from WWF offices in Germany, Italy, Netherlands, Poland, Spain and UK, as well as WWF-International and WWF European Policy Office.

Contact details for these offices are provided on the back cover of this report.

Focus of the study

The study has assessed both the total number of allowances allocated by each Member State (the cap) and the way that these allowances are distributed to individual installations (structural issues)[2]. It is these two areas that determine the effectiveness of the scheme:

- the total number of allowances allocated is a key determinant of the aggregate level of emissions from all these installations; and
- the way that they are allocated can potentially change the way that installations are operated on a day-to-day basis and affect decisions regarding installation closure and construction.

This report focuses on the first of these areas.

Criteria for environmentally effective caps

Definition of a cap

In the context of the EU Emissions Trading Scheme, a 'cap' is defined as the total number of emission allowances given to installations in each participating country (i.e. Member State). The sum of all the caps in the EU determines the total level of emissions under the scheme.

Criteria used for this study

We have developed our criteria by reviewing the requirements of the Directive and subsequent guidance provided by the Commission. In light of these criteria and our own experience of the scheme, we consider the following four areas to be important for defining an environmentally effective cap:

- The key driver of environmental effectiveness will be the **level of a cap**. It should be set to achieve emissions levels below those that would have occurred in the absence of the scheme (i.e. beyond 'business as usual') and be in line with any national and international (e.g. Kyoto) targets.

- For a cap to be environmentally effective it is also necessary that it is based on a principle of **economic efficiency**; i.e. that it takes into account the costs of abatement (both within and outside the traded sector) in order to meet emissions targets at least cost.
- **Fairness** should also be considered. If a cap is not perceived as fair, it will call into question the integrity of the scheme and therefore impact on its acceptability. A cap level should take into account differences between countries and sectors.
- In order to uphold the integrity of the scheme and gain buy-in from stakeholders, the cap setting process should be **transparent**. The assumptions behind the cap level need to be explained in sufficient detail that the level can be evaluated. The consultation process should be open to all interested parties and the cap should be set early to provide early certainty for investors. All relevant documentation should be made available to the public, preferably by publishing it on a website.

In Table 1, we present eight detailed criteria, under each of these headings, which we have used for this study.

Table 1 – Criteria used to evaluate environmental effectiveness

	Area	Criteria
1	Level of the cap	beyond business as usual (BAU)
2	Level of the cap	in line with Kyoto and national targets[4]
3	Efficiency	achieve abatement at least cost
4	Fairness	take into account the differences between countries
5	Fairness	take into account the differences between sectors
6	Transparency	clearly documented methodology
7	Transparency	include consultation with all interested parties
8	Transparency	be set early and, as far as possible, indicate the principles upon which future caps will be set

Source: ILEX

[4] For five of the six countries, we take into account the EU burden sharing agreement. For Poland, which is not part of this agreement, we consider its Kyoto target.

Table 2 – Summary evaluation of the environmental effectiveness of the Phase I caps for the six Member States

Country	1 Level: beyond BAU	2 Level: in line with targets	3 Economic efficiency: least cost abatement	4 Fairness: differences between countries	5 Fairness: differences between sectors	6 Transparency: clearly documented methodology	7 Transparency: consultation with stakeholders	8 Transparency: be set early
Germany	☹	😐	☹	😐	n/a	😐	☹	😐
Italy	☺	☹	☹	☹	😐	☹	☹	☹
Netherlands	😐	😐	☺	☹	n/a	☹	☺	😐
Poland	☹	☺	😐	☺	☺	☹	☹	☹
Spain	☺	☹	😐	☹	☺	😐	😐	😐
UK	😐	😐	😐	☹	☺	😐	😐	☹

Key: ☺ good, 😐 average, ☹ weak, n/a not applicable. Source: Avanzi, ESC, ILEX, ILEX Iberia, Öko

Evaluation of Phase I NAPs

By using these criteria we have built an objective basis against which to evaluate each NAP. The ratings are relative, based on a comparison of each of the six countries. As is the case with any evaluation of this sort, a degree of judgement has been applied to produce the summary ratings (shown in Table 2 above) and we recommend that they are considered alongside the full text of this report to give a full picture of the status of each NAP and the reasons behind the rating.

In summary, none of the caps in Phase I meet all our criteria for environmental effectiveness. There are some lessons to learn and other good examples to follow if Phase II caps are to meet our criteria for cap level, economic efficiency, fairness and transparency. Some of the good examples from Phase I include:

- the consultation process in the Netherlands was inclusive;
- the UK reflected the characteristics of different sectors by placing the greatest abatement burden on the power sector; and
- in Spain and Italy, the cap was set below business as usual projections of emissions.

The key points for each country are summarised in Table 3 below.

Table 3 – Key findings from Phase I NAPs

Country	Our view
Germany	The Phase I cap appears lax if it is compared to BAU. In addition, the relative costs of abatement were not taken into account. The bargaining approach to cap setting that was used limited the opportunity for stakeholder input. The cap level was, however, set early compared to other countries and the methodology is relatively clearly documented.
Italy	The final cap in Italy is relatively stringent compared to BAU. However, it does not take into account the Kyoto target directly. The costs of abatement were not incorporated into the cap and the cap is not in line with Italy's commitment under the burden sharing agreement. The cap does take into account differences between sectors to some extent. The stakeholder consultation process was weaker than that in other countries.
The Netherlands	The cap is broadly in line with projected emissions, rather than going beyond them. The methodology sets out how Kyoto will be met and takes into account the relative costs of abatement between sectors. However the commitment under the burden sharing agreement is not reflected and the details of the cap calculation methodology are not presented. The Dutch approach to stakeholder consultation was transparent and the cap level was set relatively early.

Country	Our view
Poland	The Polish cap level seems high compared to some projections of BAU, even after the Commission adjustment. However, the cap is still below the level implied by Poland's Kyoto's commitment. The cap does not take into account the costs of abatement but does account for the differences between sectors. The prolonged negotiations in Poland have meant the cap setting process has not been transparent, although the total number of allowances was set relatively early.
Spain	The Phase I cap stabilises traded sector emissions at historical levels (the average of 2000 to 2002). The resulting cap is below projected emissions (which are expected to rise). However, it is not in line with either the Kyoto target or the burden sharing agreement. Differences between sectors have been taken into account. The approach to stakeholder consultation was relatively transparent and the cap calculation methodology can largely be understood from the documentation[5].
UK	The UK cap is broadly in line with both business as usual and the Kyoto target. However, it is arguably not stringent when compared to the reduction implied by the national target. The contribution of other policies and measures included in the UK Climate Change Programme (which covers installations in the non-traded sector as well) was listed in an appendix to the NAP. The cap set for the power sector reflects the differences between sectors. The supporting documentation is relatively transparent and a similar approach to consultation was used to that in other countries. The cap definition was linked to emission projections, which meant that it changed when the projections changed. The UK cap was set late.

Source: Avanzi, ESC, ILEX, ILEX Iberia, Öko

Lessons learned and recommendations

The evaluation above shows how different countries set their cap for Phase I in a range of different ways. The key lessons that we have learned from Phase I are those set out below.

One of the things that we have seen is how difficult it is to compare different NAPs when each is presented in a different way, contains different information and explains each aspect of the cap decision differently. Improved co-ordination of the way that information is presented is a key consideration for Phase II.

Level of cap

- The total number of allowances should be fixed as soon as possible and be left unchanged, as was the case in Germany.
- The cap level should be based on a clear and transparent methodology – we discuss our preferred approach below.

[5] The approach to installation-level allocations is evaluated in a separate report authored by the Öko-Insitut.

- The relationship between the cap level and the Kyoto (and national) targets should be explained – for instance, the UK NAP includes a chart which illustrates trend line emissions based on Kyoto and the national target and where the cap sits in relation to these.

Economic efficiency

- The implied abatement burden on the non-traded sector should be set out clearly and justified – for instance information published for the Netherlands allows stakeholders to build up a picture of total national emissions taking into account all the different sectors.

Fairness

- The Commission evaluation of the NAPs should include an assessment of whether and how the contribution of the non-traded sector has been incorporated into each Member State's cap level.
- The Commission approval process should consider the burden that each Member State has placed on its traded sector in the light of the caps set by other Member States.

Transparency

- The assumptions behind the cap calculation should be presented explicitly.
- Where projections are used, they should be agreed at the start of the process, rather than changed as debate develops.
- The cap definition should not be linked to projections, but rather a historic level that is fixed and will not change over time.
- Projections will continue to be used to evaluate the level of 'need' of the traded sector and so to ensure that the cap level is consistent with the Directive criteria. In order to ensure that the cap is fixed early, however, it is necessary to ensure that it is linked either to historic emissions or a fixed absolute amount, rather than to a projected level.
- Consultation should be formalised both to increase the transparency of the way that governments take into account stakeholder views and to ensure that all stakeholders are given a comparable opportunity to input at an early stage.
- Where possible, the Commission should set guidelines to ensure that each Member State follows minimum requirements for consultation with interested parties.
- All relevant information should be published on a single website to ensure equal access to information for all interested parties.
- Data should be published to allow stakeholders to understand the derivation of the final figure.

We suggest that guidance from the Commission to standardise the information provided in the NAPs could help stakeholders to evaluate the NAPs and compare the approaches in different countries more easily. Without access to this

information, it is difficult to evaluate the environmental effectiveness of the scheme.

Principles for Phase II NAPs

Best-practice cap setting approaches for Phase II

The evaluation above has shown how countries used a variety of approaches and methodologies to set caps in Phase I. The Directive and subsequent guidance issued by the European Commission allowed each country considerable flexibility in this regard.

WWF has asked us which cap methodology we would recommend based on the evaluation of environmental effectiveness and lessons learned from Phase 1. In our view, the distance to target approach is the most attractive. Under this approach the cap is set at a level that reflects a predefined emissions target for the traded sector or progress towards it. This target could be either an international target (e.g. Kyoto) or a national target or one set on the basis of economic efficiency considerations.

A distance to target approach facilitates:

- like-for-like comparison of caps from one period to another – i.e. it is transparent;
- comparison with international (or national) emissions targets – i.e. it enables an evaluation of whether the cap level is environmentally effective. Where these targets have been set in a way that is agreed to be 'fair', the approach can also result in cap levels that are 'fair';
- consistency over a number of phases (thus providing a degree of certainty and so ensuring that appropriate and efficient abatement decisions are made); and
- can be calculated from published information – again assisting transparency.

Some key elements of the approach are described below.

Cap definition

One of the most important things is that it must be possible to evaluate the level of a cap in order to establish whether or not it is environmentally effective. If the baseline for change is an historic data point (rather than a projection), this can stay fixed over time, which again assists with transparency.

Consistency with international and national commitments

If the cap is set based on international (or national) commitments, then this approach can result in an environmentally effective level of cap that is also perceived to be fair. For instance, Member States have agreed that the burden sharing agreement distributes abatement in a manner that is fair and so setting a cap on this basis could also meet the fairness criterion.

Economic efficiency

We think that if an analysis of the marginal costs of abatement[6] feeds into the level at which the target is set, then the resulting cap can also be economically efficient. However, the only way to ensure that the total number of allowances allocated at an EU level is economically efficient (at an EU level) is to discard national caps in favour of a pan-EU cap. We expect that caps will continue to be set independently by each country in Phase II.

Liquidity

Where a liquid carbon market exists (and so the EU ETS functions 'perfectly'), emissions abatement will be undertaken wherever it can be achieved at least cost, regardless of which installations the initial allocation is made to. However, as soon as there is a lack of liquidity[7] and it becomes less likely that the market will work efficiently, it becomes more important that the initial allocation of allowances (the caps) are determined on an efficient basis if abatement is to be achieved at least cost.

Best practice menu for Phase II

We have highlighted throughout our analysis how environmental effectiveness requires caps that are transparent, economically efficient, fair, and are set at a level that achieves real emissions reductions. The purpose of this best practice menu is to summarise the findings that we have drawn from the detailed analysis.

A best practice cap would:

- fix the total number of allowances (cap) early, in line with the Directive timescales as a minimum, in order to provide certainty and assist in the optimisation of investment decisions;
- be based on a clear and transparent methodology, preferably expressed as:
  - a distance to target (in terms of the change on an historic base year); and
  - include an analysis of the marginal costs of abatement (for both the traded and non-traded sectors) to show why it is environmentally efficient;
- present the NAP calculation step-by-step:
  - the national Kyoto commitment (including that under the burden sharing agreement where applicable);
  - the expected level of carbon dioxide emissions from the traded sector to meet this commitment;

6 The marginal abatement cost is the cost to reduce emissions by one unit. This cost will vary between countries and organisations depending on the source of emissions, the technology employed and the fuel used in each.

7 For instance, due to delays in the issuance of allowances, or because a small number of participants control a large share of the allowances.

  - the expected level of carbon dioxide emissions from the non-traded sector to meet this commitment;
  - the targets and measures in place to meet each of these levels;
  - comparison of each of these levels against the Kyoto base year and a recent historic year's emissions;
- use projections that are:
  - independently verified and agreed at the start of the process;
  - based on published and clearly identified input assumptions;
  - explained clearly;
- show the relationship between the cap, the Kyoto target and any national commitments explicitly; and
- be subject to formal consultation and comment:
  - early enough in the decision making process for views to be taken into account;
  - taking into account views of all interested parties (including stakeholders and the public);
  - supported by informal discussions with all stakeholders; and
  - the timetable for consultation should be published and kept up-to-date.

In our view, it is likely that governments would need to use projections to inform their view of the appropriate reduction on the base year. However, it would be possible to fix the projections used relatively early on to minimise the uncertainty that changes to the projections at a later stage could cause. Bottom up data could be used to verify the projections.

Key areas of focus for Phase II

We have noted above that none of the caps in Phase I meet all our criteria for environmental effectiveness. We note here three key areas of focus in each country in order to improve the environmental effectiveness of the caps in Phase II.

Table 4 – Key areas of focus for each country in Phase II

Country	Key areas of focus for Phase II
Germany	• Level and distance below BAU – could Germany do more? • Fairness of allocation between sectors – the allocation to the power sector in Phase I appears relatively generous. • Transparency of documentation – the explanation of the assumptions used to build up the cap could be clearer.

Country	Key areas of focus for Phase II
Italy	• Cap level – the Phase I cap level does not appear to be in line with the Kyoto target. • Economic efficiency – the relative costs of abatement should be considered to determine the abatement required from the package of abatement measures that forms Italy's climate change programme. • Transparency of documentation – the level of detail in the Italian NAP could be improved to allow a more complete understanding of the cap calculation.
The Netherlands	• The Netherlands places a relatively small proportion of the abatement burden on the traded sector due to its reliance on project credits. • The relationship between the burden placed on the traded sector and meeting the Kyoto commitment should be confirmed. • The NAP should clearly set out the assumptions made to determine the total cap amount.
Poland	• The traded sector should be required to deliver real emissions reductions. • The process to set the cap should be aligned with the allocation methodology at an installation-level. • All stakeholders should be given equal access to all information.
Spain	• The Spanish cap is not in line with the Kyoto target given historic trends in emission. • The NAP should make clear the assumptions made regarding the relative costs of abatement in the traded and non-traded sectors. • The consultation process with stakeholders could be improved to ensure that all interested parties are given equal opportunity to influence the process.
UK	• Set any projections before the cap-setting process begins. • Use a cap-setting process that requires a fixed proportionate reduction on a historic base year and is in line with both Kyoto targets and national commitments. • Set the final cap within the timescales prescribed by the Directive.

Source: Avanzi, ESC, ILEX, ILEX Iberia, Öko

Harmonisation

Our evaluation of the Phase I caps has highlighted how different Member States set their caps in a wide range of ways. This has made it difficult to be sure that we are comparing like with like and to understand the detailed assumptions behind the final caps. There is therefore significant scope for both the cap setting methodologies and the documentation explaining them to be harmonised in Phase II.

In order to improve the environmental effectiveness of the scheme, harmonisation would need to affect each of the areas we have considered above:

- the level of each cap;
- the way that it is calculated, to take into account:
  - economic efficiency, i.e. the costs of abatement inside and outside the scheme;

  - fairness, the way that abatement is distributed between different countries and installations; and
- the way that the cap calculation is explained and presented, to improve transparency.

In this context, harmonisation means aligning the level of national caps by ensuring that the ways that they are calculated and presented are similar.

We consider that it would be possible to align the approach used in different countries more closely in Phase II than was the case in Phase I, and improve each of these areas.

- In terms of ensuring that the cap level is environmentally effective, using a single set of projections to evaluate the NAPs would help to ensure that each country cap was being assessed in the same way and would also assist in ensuring fairness between countries.
- Given the time constraints for Phase II, it might at least be possible to ensure that the level of each cap is compared against the same source of historic data. This would assist transparency and help to ensure that caps are assessed in a consistent way, both of which would help to ensure that caps are perceived to be 'fair'.
- Member States could be encouraged to explain the way that they have incorporated both national and international targets in a similar way, in order to improve transparency and to assist the comparison of the cap levels across countries.
- From an economic efficiency perspective, it would be best to ensure that all cap levels are set together, to ensure that the total number of allowances is set at a level that is efficient on an EU-wide scale.
- However, given the time and political constraints that would need to be overcome to make this feasible for Phase II, it should at least be possible to ensure that each cap takes into account the marginal costs of abatement between the traded and non-traded sectors.
- Lastly, there is plenty of room for harmonisation in the way that information is presented and the way the cap levels and their calculation are described and explained. For instance, the format and structure of each NAP could be made consistent, all relevant documentation could be published on a single website and the timetables for the cap setting process could be published and kept up to date.

Beyond 2012: cap recommendations

Given our analysis of the Phase I NAPs, the key issues that we consider important for the setting of environmentally effective caps beyond 2012 are set out below. These are points that could be borne in mind by all decision makers when determining policies for the period beyond Phase II.

- Decisions should be made as early as possible not just on the cap level, but also on the principles for the long-term operation of the scheme in order to provide operators with a degree of certainty.
- The total number of allowances and role of project credits should be set at as aggregate a level as possible (i.e. an EU level).
- Harmonisation of approach at any level would help keep things simple, reducing the range of methodologies that interested parties need to understand and facilitating the like-for-like comparison of each aspect;
- Steps should be taken to ensure that a liquid market develops – this objective could be facilitated through expansion of the scheme.
- The length of each Phase should be fixed. Keeping to the same length as Phase II (5 years) would help ensure consistency.
- Projections will inform the debate but a single, published set should be used by everybody.
- Given the uncertainties surrounding projections, targets and commitments should also be described against a historical base.
- Rules and decisions should be explained in as transparent a way as possible.

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1. INTRODUCTION AND BACKGROUND

1.1 WWF has commissioned ILEX together with a consortium of consultants[8] to evaluate the environmental effectiveness of the EU Emissions Trading Scheme (ETS).

Purpose of this report

1.2 The purpose of this report is to provide an independent analysis of the national allocation plans (NAPs) in six key Member States: UK, Germany, Italy, Poland, Spain and the Netherlands. This report focuses on the evaluation of the total number of allowances (or caps) allocated by different Member States[9].

1.3 For this report, we have compared the approaches used for cap setting in each of the countries in Phase I (2005-7). We have based this assessment on a series of criteria agreed with WWF and described below.

1.4 We have used our analysis to identify areas to address to improve the environmental effectiveness of the scheme in Phase II (2008-12). We have also developed a list of the key components necessary to ensure that caps are environmentally effective (a 'best practice menu').

Policy background

1.5 Under the Kyoto Protocol, the EU-15 has committed to reducing the basket of six greenhouse gases[10] by 8% compared to base year levels by 2008-12[11]. Figure 1 shows how recent emissions were just 2.9% below base year emissions showing that considerable effort still needs to be made to meet this target.

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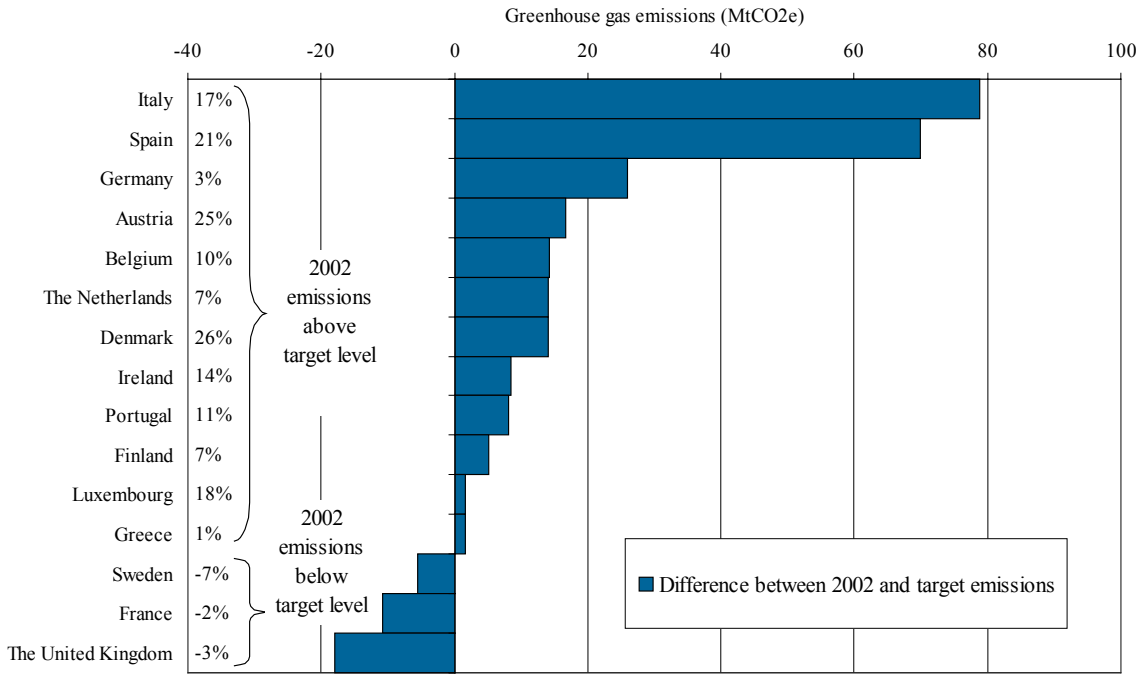
8 Avanzi, ESC, ILEX Iberia, Öko-Institut.

9 A separate report 'The environmental effectiveness and economic efficiency of the European Union Emissions Trading Scheme: Structural aspects of the allocation' authored by the Öko-Institut evaluates the way that these allowances have been distributed to individual installations.

10 Carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_20), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6).

11 The joint EU commitment under the Kyoto Protocol applies only to the EU Member States at the time of the adoption of the Protocol. The base year for CO_2, CH_4 and N_2O is 1990; for the fluorinated gases 13 Member States of the EU-15 have chosen to select 1995 as the base year, whereas Finland and France have chosen 1990. As the EC inventory is the sum of Member States' inventories, the EC base year estimates for fluorinated gas emissions are the sum of 1995 emissions for 13 Member States and 1990 emissions for Finland and France.

Figure 1 – Recent GHG emissions in the EU



Source: European Commission[12].

1.6 Each Member State has assumed a legally binding commitment under the so-called 'burden sharing agreement'. This agreement distributes the reductions required to meet this EU-wide target across different Member States.

1.7 Member States can use a variety of national policies and measures to meet these targets, to encourage abatement from a range of sources, including in the domestic, transport, commercial and industrial sectors.

1.8 In addition to national policies, the Kyoto Protocol allows Member States to use flexible mechanisms to achieve abatement. Countries may surrender credits generated under the flexible mechanisms listed below to comply with their emissions limit under the Protocol:

- international emissions trading (IET): allowing states to trade emissions credits (also called 'allowances') in order to ensure that abatement is achieved at least cost;
- joint implementation (JI): projects to reduce emissions (or remove emissions from the atmosphere) in other Annex I[13] countries that generate emissions reduction units (ERUs); and

12 http://europa.eu.int/comm/environment/climat/gge_press.htm

13 Annex I countries include members of the Organisation for Economic Co-operation and Development (OECD) in 1992 plus transitional economies that have signed the Kyoto Protocol. A majority of non-Annex I countries are developing countries.

- the clean development mechanism (CDM): projects to assist non-Annex I[13] countries achieve sustainable development that will generate certified emissions reductions (CERs).

Introduction to the EU ETS

1.9 The EU Emissions Trading Scheme (ETS) began on 1 January 2005 and is linked to the first category of flexible mechanisms described in paragraph 1.8 above for the year 2008 and beyond.

1.10 The Emissions Trading Directive[14] established a framework for the rules of the scheme, which is divided into phases. The first, a pilot phase, will run for three years (until 2007). Subsequent phases will be five years in length. Phase II is five years in length and runs from 2008 to 2012. Each Member State is required to develop a National Allocation Plan (NAP) that determines the total number of allowances that they will allocate to installations covered by the scheme. The NAP details the number of allowances allocated to reserve for new entrants and the number of allowances issued to individual installations in each year of any phase.

1.11 Operators of installations included in the scheme have an obligation to surrender sufficient allowances each year to cover the installation's annual emissions. They may either use allowances allocated to them for free in the NAP or buy allowances from other installations in the scheme. In Phase I, operators may also use CERs and in Phase II, both CERs and ERUs to comply with their obligations.

1.12 The EU ETS is a mandatory scheme that captures combustion installations and manufacturing processes, from boilers in universities and hospitals, to power stations and other key sources of greenhouse gas emissions, e.g. steel plant, cement production facilities and refineries. As such, it covers some of the major emitters of greenhouse gases in Europe. It therefore forms a key part of the EU strategy to reduce greenhouse gas emissions in line with the Kyoto target.

1.13 Phase I of the scheme covers carbon dioxide emissions specifically. In Phase II, Member States may decide unilaterally to expand the scheme to cover other sectors and gases.

Structure of this report

1.14 The remainder of this report is structured as follows:

- we describe our approach to the study in Section 2;
- in Section 3 we explain the criteria on which our analysis of the environmental effectiveness of caps is based;

[14] Directive 2003/87/EC (http://europa.eu.int/eur-lex/pri/en/oj/dat/2003/l_275/l_27520031025en00320046.pdf)

- we present our analysis of Phase I caps in Section 4;
- we set out the issues to be considered in the design of caps for Phase II in Section 5;
- we list the best practice provisions for cap setting in Section 6;
- we explore the benefits of a harmonised approach across different Member States in Section 7;
- in Section 7 we identify the key areas that could improve the environmental effectiveness of the NAPs in Phase II;
- we discuss issues for cap levels after Phase II, i.e. beyond 2012, in Section 8; and
- we summarise the main findings of the study in Section 10.

1.15 We have included a list of acronyms and abbreviations in Annex A.

2. APPROACH TO THIS STUDY

Scope of project

2.1 The purpose of this report is to provide an independent analysis of the cap levels and approach to cap setting for six key Member States: UK, Germany, Italy, Poland, Spain and the Netherlands.

2.2 These six countries were chosen since their NAPs include approximately 68%[15] of the allowances allocated under the scheme. As a result, policy decisions in these countries will have a significant impact on the environmental effectiveness of the scheme. In addition, the NAPs reflect a wide range of approaches to cap setting that have allowed us to compare and contrast a variety of options.

Structure of project

2.3 The study has assessed both the total number of allowances allocated by each Member State (the cap) and the way that these allowances are distributed to individual installations (structural issues)[16]. It is these two areas that determine the effectiveness of the scheme:

- the total number of allowances allocated is a key determinant of the aggregate level of emissions from all these installations; and
- the way that they are allocated can potentially change the way that installations are operated on a day-to-day basis and affect decisions regarding installation closure and construction.

Organisations involved

2.4 Five consultancies were involved throughout the course of this project, listed below. Each provided country-specific data, analysis and wider comment on the approach and findings. ILEX led the analysis and was ultimately responsible for delivering this report.

- Avanzi (Italy);
- EcoSolutions Consulting (ESC) (Poland);
- ILEX (UK);
- ILEX Iberia (Spain); and

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15 Based on data from European Commission website (http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/05/762&format=HTML&aged=0&language=EN&guiLanguage=en)

16 A separate report 'The environmental effectiveness and economic efficiency of the European Union Emissions Trading Scheme: Structural aspects of the allocation' authored by the Öko-Institut evaluates the way that these allowances have been distributed to individual installations.

- Öko-Institut (Germany).

A profile of each organisation, together with contact details, is provided at Annex B (on page 81).

The project was funded by WWF-UK, WWF-Germany and WWF-International. The initiation of the project, preparation of draft versions and review of the final report included input from WWF offices in Germany, Italy, Netherlands, Poland, Spain and UK, as well as WWF-International and WWF European Policy Office.

Contact details for these offices are provided on the back cover of this report.

Information sources

2.5 We have based our analysis of Phase I on the information provided in each NAP. Since not all of the NAPs were finalised when we started the project (July 2005), we have based our analysis on the most final information available. For reference, we have noted the version of the NAP on which our findings are based in Table 5.

Table 5 – Status of NAPs reviewed for this project

Country	Version of NAP
Germany	NAP laid down in the German Allocation Law 2007 (ZuG 2007 – Zuteilungsgesetz 2007) as of 26 August 2004.
Italy	Primarily the "Integration to NAP" (the notified plan by letter dated 24 February 2005) and also the Commission Decision of 25/V/2005
The Netherlands	The final version of the NAP (11th Revision), dated 13 April 2004
Poland	4th version (further referred to as NAP-4), published by the Polish Ministry of Environment (MoE) on 28 June 2005 (with reference to earlier versions of the NAP where appropriate)[17]
Spain	The final version of the NAP, dated January 2005
United Kingdom	Final approved UK NAP published May 2005

Source: Avanzi, ESC, ILEX, ILEX Iberia, Öko

Approach to analysis

2.6 In order to review the caps on a like-for-like basis and to ensure that we are capturing all of the areas relevant to assess the environmental effectiveness of the scheme, we developed a series of criteria to form a framework for our assessment. These criteria are designed to reflect the key areas that will impact on the level of

[17] Several further revisions of the NAP have been produced since this project began, however the total number of allowances (on which we concentrate here) has been fixed since March 2005. The fourth version was available at the start of the project and provides more information regarding the allocation of allowances between sectors than earlier versions. (The first version of the NAP was the most detailed, but we have not used it here since it was rejected by the Commission.)

emissions under the scheme. We set out both the criteria and our evaluation of how each Member State's NAP meets these in Section 3 below.

2.7 Our analysis has been based on the information contained in the NAP documents themselves and other supporting information. The level of detail provided varies significantly from country to country, as does the way that information is presented and the format in which it is reported. Throughout the course of the project we have attempted to ensure that we are comparing equivalent information; however in some instances it has not been straightforward to confirm that this is the case. It is important to bear this in mind when interpreting the results and conclusions set out below.

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3. CAPS AND REDUCTION POTENTIALS

3.1 In this section of the report, we compare and contrast the ways that different Member States set cap levels for Phase I of the scheme. We explore how these decisions might impact on the environmental effectiveness of the EU ETS. We then discuss the way in which caps could be set in Phase II and have analysed quantitatively the kinds of levels these approaches could imply.

Definition of a cap

3.2 In the context of the EU Emissions Trading Scheme, a 'cap' is defined as the total number of emission allowances given to installations in each participating country (i.e. Member State).

3.3 In their National Allocation Plan (NAP), each Member State determines the level of this cap i.e. total number of EU allowances (EUAs) that they will allocate to all the installations included in the scheme during the period of trading and also set aside in a reserve for new entrants in that phase. The installations covered by the scheme will be able to emit up to this level and can trade EUAs between themselves. They will also be able to buy project credits from CDM and JI (see paragraph 1.8).

3.4 Some Member States separated out the total allocation between the activities or sectors captured in the scheme, resulting in sector and even sub-sector caps (e.g. the UK has over 50 sub-sectors). Others (such as Germany and the Netherlands) have not used sector specific allocations at all[18] .

Role of the cap in ensuring the environmental effectiveness of the EU ETS

3.5 At an EU level, the caps, together with the extent to which countries allow project credits to be used, determine the maximum level of emissions allowed from installations covered by the scheme in each Phase. The tighter (or lower) the caps, the fewer allowances that are issued and so the lower emissions under the scheme will be. Laxer (or higher) caps will mean more allowances are issued and so emissions under the scheme can be higher.

3.6 We consider the level of emissions under the scheme to be the key determinant of its environmental effectiveness. The total of the caps for all the Member States determines how much installations will need to reduce and manage their

[18] Germany and the Netherlands have shared out the total number of allowances by calculating the number that should be given to each installation without grouping these installations into sectors first.

emissions. In order to deliver national and Kyoto commitments, governments must set caps in line with achieving these goals.

3.7 The sum of all the national caps determines the total level of emissions from the EU traded sector as a whole. In order to drive abatement in the traded sector to assist the EU in reaching its Kyoto target, the total number of allowances allocated will need to fall over time.

3.8 We discuss the key criteria that we use to assess the environmental effectiveness of each country's cap and the way that it is set below.

Principles for setting caps in Phases I and II

3.9 When calculating the total number of allowances to allocate, a Member State must ensure that it complies with the criteria in the Emissions Trading Directive and guidelines set out by the Commission. We present these below.

Directive requirements for the caps

3.10 The Emissions Trading Directive requires that the total number of allowances to be allocated in each year should be reported in the NAP. The total must be calculated using the following principles:

- consistency with each Member State's commitment under the Kyoto Protocol (and where applicable the burden sharing agreement), taking into account:
  - the proportion of future emissions for which the traded sector will be responsible; and
  - national commitments and targets, both in terms of energy policy and domestic climate change programmes;
- allocation in line with need:
  - Phase I caps should put Member States on a path to at least achieve the burden sharing agreement and Kyoto Protocol commitments;
- consistency with actual and projected progress in national emission as reported to the Commission;
- consistency with the traded sector's abatement potential; and
- ensuring that one undertaking or activity is not unduly favoured over another.

3.11 In order to comply with the Directive, Member States must also ensure that the NAP:

- is based on criteria that are transparent and objective;
- takes due account of public comments;
- is supported by allowing stakeholders to access explanations of the decisions taken;
- allocates at least 95% of allowances for free in Phase I, 90% in Phase II; and

- takes into account the need to allocate allowances to new entrants.

Commission guidance

3.12 The Commission also elaborated guidance[19] for Member States which reinforced the criteria set out in the Directive (listed above) and also clarified that:

- the higher the cap for the traded-sector, the lower emissions from the non-traded sector would need to be to meet any target level;
- where other policies and measures mean that emissions levels are expected to increase in the future, for instance due to the replacement of nuclear power plant, accommodation of the projected increase in the cap would be acceptable;
- when ensuring a Member State was on course to at least achieve its Kyoto and national targets, the cap would be expected to be on a trend line (not necessarily a straight line) to those targets;
- a Member State should demonstrate how it has taken into account the Kyoto target;
- the cap calculation should take into account the proportion of emissions covered under the scheme, based on the most recent data available:
  - the NAP should explain assumptions regarding the future proportion of emissions outside the scheme;
  - any significant deviations from the current proportion of emissions from the traded sector should be explained;
- the Commission views likely need to be linked to projections of the traded sector as a whole;
- once a Member State has decided the proportion of emissions for which the traded-sector is responsible, this should be used together with a country's commitment under the Kyoto Protocol (and burden sharing agreement where applicable) to calculate the cap;
- the abatement potential of the traded sector should consider:
  - the difference between the options available to operators in the long and short term;
  - the economic and technical potential to abate; and
- that the impact of legislative and policy instruments need only be considered if the expected impact on emissions is significant.

[19] http://europa.eu.int/eur-lex/en/com/cnc/2003/com2003_0830en01.pdf

Criteria to assess the environmental effectiveness of the Phase I and II caps

3.13 The aim of this part of the report is to assess whether we consider the Phase I NAPs to be environmentally effective, where they could have been improved and the principles that should be used in developing Phase II caps to ensure that they are environmentally effective.

3.14 We set out the criteria that we have used to make these judgements, based in part on the Directive and Commission principles above and also on our own view of what constitutes environmental effectiveness. We have grouped these criteria into the following areas:

- level of the cap;
- economic efficiency;
- fairness; and
- transparency.

Level of the cap

3.15 The key driver of environmental effectiveness will be a cap's level, including how it compares to business as usual and any national targets. To assess this, we have developed two criteria, that a cap should:

- be at a level to drive real emissions reductions beyond those that would have happened anyway; and
- be at a level that (together with expectations/targets for the non-traded sector) will result in stated national and international emissions targets (e.g. the Kyoto targets for 2008 to 2012) being achieved.

Economic efficiency

3.16 For a cap to be environmentally effective, it is also necessary that it is based on a principle of economic efficiency; i.e. that it takes into account the costs of abatement (both within and outside the traded sector) in order to meet emissions targets at least cost. Our next criterion is therefore that a cap should:

- be at a level to achieve the abatement necessary to meet the targets at least-cost. In other words, it should properly reflect the economic abatement potential of the traded sector (as compared to the non-traded sector).

Fairness

3.17 Fairness should also be considered. If a cap is not perceived as fair, it will call into question the integrity of the scheme and therefore impact on its acceptability. To be fair, a cap should distribute the economic burden between installations covered by the scheme and the non-traded sectors equitably. When considered together, the EU caps should also distribute allowances across the Member States in a way that reflects their national and international commitments. If the

distribution is not balanced in this way, it could be perceived to impact on the international competitiveness of one or more Member States.

3.18 For the purposes of this report, in order to be considered 'fair', as between countries, sectors and installations, a cap should:

- meet our third criteria (for economic efficiency) above;
- be at a level that takes into account the differential costs and potential for abatement in different countries (while taking national targets into account); and
- be at a level that takes into account the differential costs and potential for abatement in different sectors (for this report, we concentrate on the power sector).

Transparency

3.19 In order to uphold the integrity of the scheme and gain buy-in from stakeholders, the cap setting process should be transparent. The assumptions behind the cap level need to be explained in sufficient detail that the level can be evaluated. The way in which economic efficiency and fairness have been considered should be explained in a sufficient level of detail that stakeholders can understand how the cap meets the criteria above. It should:

- be set through a transparent and clearly documented methodology;
- be developed in a way that includes consultation (with stakeholders and the public). The consultation should:
  - be open to all interested parties;
  - allow time for stakeholders to understand the issues and provide comment;
  - be early enough that stakeholders' views can feed into the decision making process;
- be fixed as early as possible to provide certainty for stakeholders as they consider investments that affect emissions in the short, medium and long-term.

3.20 It is therefore the level of allocations and also the way in which they are calculated, plus the way that the methodology is explained to stakeholders, which determines the environmental effectiveness of a cap. If stakeholders do not have confidence in the level of allocations in the long-term then that will undermine the EU ETS as a whole.

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4. EVALUATION OF PHASE I CAPS

Description of the caps in the Phase I NAPs

4.1 In the following pages we present a description of the way that the cap was set in each of the six countries that we have examined (Table 6). We have considered:

- the total number of allowances allocated;
- the calculation methodology used to determine the cap;
- whether projections have been used and if so:
  - the basis for the projections (e.g. historic interpolation);
  - what assumptions are included in the projections;
  - the base years to which these projections are applied;
  - how growth factors differentiate between sectors;
  - whether there are any correction factors;
- transparency in using projections and the way in which caps were developed;
- how project credits have been accommodated, both for individual installations and government;
- any special circumstances;
- how the cap relates to the non-traded sector; and
- political considerations in the history of the process of developing the cap and NAP submissions.

Table 6 – Description of the caps in the Phase I NAP

Country	Germany
Total number of allowances allocated	In total, the NAP allocates 499MtCO_2 per year for Phase I. This amount is allocated equally for each year of the phase.
The calculation methodology used to determine the cap	The German cap for 2005/2007 was developed in a two-step approach. The cap is the result of a pure bargaining process among the ministries and with industry. 1. Based on the most recent emission inventories available in 2003 the CO_2 emissions of EU ETS sectors amounted to 505MtCO_2 (on average between 2000 and 2002, the base period for Germany). As a result of the bargaining process, the annual average emissions target for the sectors was defined as503MtCO_2. 2. Based on the reduction from 505MtCO_2 in the base period to 503MtCO_2 for the period 2005 to 2007, a reduction factor of 0.996 was calculated. The collection of bottom up data showed coverage of 501MtCO_2 for the EU ETS. The annual cap of 499Mt CO_2 resulted from a multiplication of the bottom up result and the reduction factor.
Projections	The cap discussion was based on historic emissions and the Kyoto target only.
• the basis for the projections	No projections were used. The cap is based on an "emissions budget" for both phases separately, which is based on historic emissions and the Kyoto target alone.
• what is included in the projections	n/a
• the base years to which these projections are applied	The base period in the German NAP is 2000 to 2002. However, no projections are based on this (since no projections are used).
• how growth factors differentiate between sectors	Growth is not explicitly taken into account.
• whether there are any correction factors	A compliance factor (0. 9709) and a cap adjustment factor (0.9538) are applied to all combustion related emissions at installation level (if no special provisions apply, e.g. emissions from industrial processes, early action, etc.).
• transparency in using projections and way in which caps were developed	All formulae are given in the NAP, even if it is not simple to understand the differences between the (necessary) top down and bottom up approaches.
How project credits have been accommodated	The use of project credits acquired by the state is not mentioned in the NAP.
Any special circumstances	The special provision for nuclear phase out was a part of the cap, but not subject to the cap adjustment factors. The same applies to the majority of allocations, a where compliance factor of 1 was applied (e.g. to reflect early action, process emissions, etc.)
How the cap relates to non-traded sector	Emission ceilings for the non-traded sectors were determined for both phases.
Political considerations.	The assessment of existing policies and measures was subject to a bargaining process to some extent, mostly regarding whether the emissions ceilings for the non-ETS sectors (as mentioned above) could realistically be met.

Country	Italy
Total number of allowances allocated	The Commission approved an allocation of 697MtCO_2 for the whole of Phase I. A different cap amount was calculated for each year; however, the final total amount is the same in every year.
The calculation methodology used to determine the cap	The Italian cap is calculated bottom up on an activity-level basis to create the traded sector cap. A projected growth rate is applied to the traded sector's historic emissions in 2000. The business-as-usual (BAU) projections used to determine the sectoral allocation for the electricity sector are based on recent evaluations provided by the Ministry for Productive Activities. These are not in line with the scenarios included in the National Action Plan for GHG Reduction.
Projections	Projections were used in the calculation of the Italian cap.
• the basis for the projections	The projected growth rate is modelled, based on historical emissions and expected trends.
• what is included in the projections	Existing policies and measures were taken into account in the scenarios to project emissions to 2010. The potential of emissions reductions from additional measures has been reviewed on the basis of updated information, provided by the Ministries in charge of implementing each of them. Possible changes in the technological potential of the sectors and the national economic development needs between the first and second phases were also considered.
• the base years to which these projections are applied	The cap is calculated by applying growth rates to 2000 emissions at the activity level.
• how growth factors differentiate between sectors	Emissions growth projections were calculated from sectoral growth production projections, calculated by extrapolating the historical growth rate. The district-heating sector was allowed to grow by 4.5%, as compared to the ferrous metals sector, where the annual growth rate was only 0.9%.
• whether there are any correction factors	A correction factor was not applied.
• transparency in using projections and way in which caps were developed	The initial estimates were based on top down information, which were checked using data collected through an ad hoc survey carried out at plant level (a bottom up approach). Data was collected on the basis of a legally binding instrument that also includes provisions for verification and certification, constituting the reference value for the final allocation.
How project credits have been accommodated	Not mentioned (although in Phase II, the Italian Government expects to buy allowances to meet its Kyoto target).
Any special circumstances	n/a
How the cap relates to non-traded sector	The total quantity of allowances to be allocated represents about 43% of overall emissions. This is a very similar proportion to the current contribution of emissions from covered installations.
Political considerations.	n/a

Country	The Netherlands
Total number of allowances allocated	In total, the NAP allocates 95.5MtCO_2 per year for Phase I. This amount is split equally for each year of Phase I. There were three versions - the Government published one for consultation in February 2004, increased the cap slightly following public consultation in April 2004 and the Commission then approved a lower, final amount in June 2005.
The calculation methodology used to determine the cap	The cap for the Netherlands is in line with the traded sector's contribution to meeting the Kyoto target. The cap level was set through top down analysis to calculate the number of allowances to allocate to the traded sector, combined with bottom up projections to calculate installation-level allocations. The final cap is at a level somewhere between the top down and bottom up calculations.
Projections	Projections were used in the calculation of the Dutch cap.
• the basis for the projections	Projections vary from sector to sector and take into account energy efficiency agreements and benchmarking covenants.
• what is included in the projections	The projections used to set the cap put the traded sector of the Netherlands on a path to Kyoto. The bottom up projections (used to calculate installation-level allocations) take into account both the energy efficiency covenants that industry has entered into, and also sector growth.
• the base years to which these projections are applied	n/a
• how growth factors differentiate between sectors	The formula to calculate installation-level allocations includes a factor for sector growth. This sector growth rate is applied to historic emissions and adjusted by an energy efficiency factor (to reward early action).
• whether there are any correction factors	Yes, there are correction factors at the installation-level. An adjustment factor has been applied to reconcile the total number of allowances required (based on the sum of all allocations) with the cap level.
• transparency in using projections and way in which caps were developed	The general principle is easy to understand, however, some details are not presented in the NAP. For example, the assumptions behind the emission projections are not clear, nor are the details of the way that the final cap amount was set. The various iterations were explained on the basis that the data quality had been improved, corrections made to the calculations and stakeholder views and comments incorporated.
How project credits have been accommodated	Purchase of project credits is not mentioned at all for the first phase. They are expected to play a major role in the second.
Any special circumstances	n/a
How the cap relates to non-traded sector	All the non-traded sectors (agriculture, traffic and transport, built environment, and other greenhouse gases) have their own targets to meet the total Kyoto target. The sectors are treated separately, so that every sector has to do its part to reach the target. The target for the traded sector was developed taking these different targets into account.
Political considerations.	n/a

Country	Poland
Total number of allowances allocated	A total of 717MtCO_2 for Phase I was approved by the Commission. The cap figure is the same for each year.
The calculation methodology used to determine the cap	The final cap was calculated by the Commission and published in the Commission Decision of 8 March 2005. The subsequent Polish NAPs attempt to distribute the allocations among sectors and installations, correcting the initial NAP-1. The original baseline emissions quota included forecast emissions from all the installations covered by the system. The resulting approach is therefore bottom up, incorporating projected emissions.
Projections	Projections were used in the calculation of the Polish cap.
• the basis for the projections	All versions of Polish NAPs are based on a top down approach (analysis of microeconomic scenarios) combined with a bottom up approach (analysis of development forecasts at the sector and company level).
• what is included in the projections	The baseline projections are based on economic modelling, rather than policy measures per se. The Commission decided that the original basis for calculation resulted in a cap that exceeds projected emissions. This was in part due to the fact that differences between expected and outturn generation would have been reflected by changes to allocations to the power sector. A number of special reserves for incumbent coking plants, unidentified installations, and unplanned emission growth in the EU ETS sectors also resulted in higher emissions levels than the Commission deemed appropriate. The revised approach is designed to correct this overestimation.
• the base years to which these projections are applied	The total cap was calculated by multiplying 2002 emissions by projected GDP growth and emission intensity for each year (2005 to 2007), and then calculating the average CO_2 emissions annually for 2005-2007 (351.5MtCO_2e at a national level), to give a single cap figure for every year.
• how growth factors differentiate between sectors	The approved cap was not developed using sector specific factors, however different sector growth rates are being used in order to split the resulting total number of allowances between sectors.
• whether there are any correction factors	n/a
• transparency in using projections and way in which caps were developed	In NAP-4, the Ministry of the Environment (MoE) collected emissions data and production data from individual installations for 2003 and 2004. Emissions data for 2001 and 2002, collected during the preparation of NAP-1 were also taken into account.
How project credits have been accommodated	Reference to JI or CDM does not appear in the NAP versions drafted after publication of the Commission Decision of 8 March 2005. The government does not intend to buy extra allowances (given Poland's surplus).
Any special circumstances	n/a
How the cap relates to non-traded sector	NAP-1 forecast limited emission growth from the non-traded sectors, assuming higher energy intensity of production (due to projected increases in electricity consumption). Transport was singled out as a sector with significant expected emissions growth.
Political considerations.	n/a

Note: based on the fourth version of the NAP published on 28 June 2005 (refer to Table 5).

Country	Spain
Total number of allowances allocated	The Commission approved a total allocation for Spain of 160 Mt CO_2 per annum. The cap is calculated for the year 2006, which is assumed to be an average year of the first period. The same cap is then used for 2005 and 2007.
The calculation methodology used to determine the cap	The Spanish cap was calculated top down, setting the total number first and then sharing it between sectors, based on their projected emissions. Abatement will be shared between the traded and non-traded sectors (40%:60%) in order to meet Kyoto. Even taking this into account, projected emissions are higher than the Kyoto target.
Projections	Projections were not used in the Spanish cap calculation in the same way as in other countries - the total allocation to incumbents is equal to average 2000-2002 emissions. Projections were however used to calculate each sector's share of the cap.
• the basis for the projections	For industrial sectors, projections were based on historic growth (1990 to 2001). Projections used for the power sector, took into account factors including future demand and the contribution of renewables.
• what is included in the projections	The projections were adjusted for recent economic cycles. In addition, the approach takes account of abatement action in both the traded and non-traded sectors to date. It also takes into account each sector and activity's future reduction potential. It was decided that stabilizing the emissions to the average level of the historical emissions in 2000-2002 was enough to put EU ETS sectors to the path of Kyoto.
• the base years to which these projections are applied	The projected growth rates were applied to each sector's 2001 emissions.
• how growth factors differentiate between sectors	The Spanish cap was set and then shared out between the sectors, taking into account sectoral emissions reduction potentials. This cap is approximately 2.5% lower than emissions in 2002.
• whether there are any correction factors	n/a
• transparency in using projections and way in which caps were developed	Many things (like the exact allocation method and assumptions for electricity production, the emission projections, etc.) are not explained in detail.
How project credits have been accommodated	There is an assumption that sinks will be used (2%) and project credits will be purchased (7%) to meet the Kyoto target in the second phase, but not the first.
Any special circumstances	n/a
How the cap relates to non-traded sector	Emissions from the non-traded sector were considered in calculating the path for Spain to reach its Kyoto target. How that information is used in the calculation of the Phase I cap is not absolutely clear. We understand that the abatement burden will be shared between the traded and non-traded sectors.
Political considerations.	n/a

Country	UK
Total number of allowances allocated	The first NAP was published for consultation in January 2004 allocated 238.2MtCO_2 per annum in Phase I. This was updated in May 2004 to 245MtCO_2 per annum and subsequently an adjustment was proposed in November 2004 to 252MtCO_2 per annum. The final NAP approved by the Commission in May 2005 was based on the May amount (245MtCO_2 per annum).
The calculation methodology used to determine the cap	The UK cap was calculated by projecting Business As Usual (BAU) emissions for the traded sector and subtracting an amount (5.5MtCO_2) that represented the expected contribution of the EU ETS to the UK's Climate Change Programme. The final cap amount is based on an interim version of the projections (rather than the final version which would have implied a higher cap level).
Projections	Projections were used in the calculation of the UK cap.
• the basis for the projections	Projections were modelled for the UK Department of Trade and Industry (DTI) Updated Energy Projections (UEP). The projections of the model are consistent with the Treasury's projection of 2% growth per annum across the UK economy as a whole.
• what is included in the projections	National targets and existing policy measures were incorporated through the use of the 'with measures' projection. This projection takes into account expected abatement from some of the measures adopted as part of the UK's Climate Change Programme to meet its national emissions target. The BAU scenario does not incorporate the cost of carbon resulting from the introduction of the EU ETS.
• the base years to which these projections are applied	Where projections were applied to historic emissions, the base year used was 2002.
• how growth factors differentiate between sectors	The traded sector was divided into 51 sectors. Sub-sector growth rates were applied to sectors' historic emissions or output projections together with energy efficiency targets were used to calculate sector-level allocations.
• whether there are any correction factors	The allocation for the power sector was 'corrected' to reflect the difference between the UK's final bottom up calculation of the cap and the amount approved by the Commission (the difference between the 245MtCO_2 approved and the 252MtCO_2 proposed).
• transparency in using projections and way in which caps were developed	Some information on the projections was published and Government presented the results and assumptions to stakeholders. The various iterations of the cap and the limited level of detail published have caused some to question the transparency of the projections and their use in setting the cap.
How project credits have been accommodated	The UK NAP does not comment on the way that JI and CDM will be used either by individuals or government.
Any special circumstances	n/a
How the cap relates to non-traded sector	The use of bottom up data was designed to ensure that the sector totals matched those installations covered by the scheme. Abatement in the non-traded sector is determined by the UK Climate Change Programme, which considers the contribution of both the traded and non-traded sectors (and is currently under review).
Political considerations.	The UK published a NAP based on provisional information and projections, which was subsequently adjusted and submitted twice. The European Commission rejected the second submission on the basis that the initial submission was considered to be final version.

Evaluation of the Phase I NAPs against criteria for environmental effectiveness

4.2 As set out in paragraphs 3.15 to 3.20, we have considered criteria in four key areas in assessing whether or not each of the six Phase I caps is environmentally effective. We consider each of these areas below.

4.3 It is worth noting that it is difficult to find historic emissions figures that refer to the EU ETS population specifically; the relevant historic data are not available in all of the NAPs. For this report, we have used the data in countries' National Inventory reports[20] to make sure that we are using a consistent basis; however the coverage of these data are somewhat different to that of the scheme.

1. Level of the cap: beyond business as usual

4.4 In order to meet our first criterion, a cap should be at a level to drive real emissions reductions beyond those that would have happened anyway (i.e. business as usual). For this to be true, we would expect the caps to result in emissions below our projections for emissions in the absence of the scheme[21]. In addition, the aggregation of all national caps should show a reduction on historic emissions (and, in particular, base year emissions) for the EU as a whole. (This may also be the case for individual member states as discussed in paragraph 4.10 below.)

4.5 One of the key questions is the appropriate level for business as usual. A wide range of uncertainties exists in projecting emissions in Phase I – from fuel prices to carbon prices, economic growth to weather – all have an impact on expected emissions. Each national government, not to mention stakeholder, will have a different view of the likely level of emissions in Phase I and these views will change over time as new information comes to light. The potential for differences in opinion was highlighted during the development of NAPs for Phase I, as the UK adjusted emissions projections a number of times. In Germany, on the other hand, the cap was based on an 'emissions budget' rather than projections. For the purposes of this report we have used the Electrowatt-Ekono projection of BAU emissions to ensure that the assumptions behind them are consistent across the six different countries.

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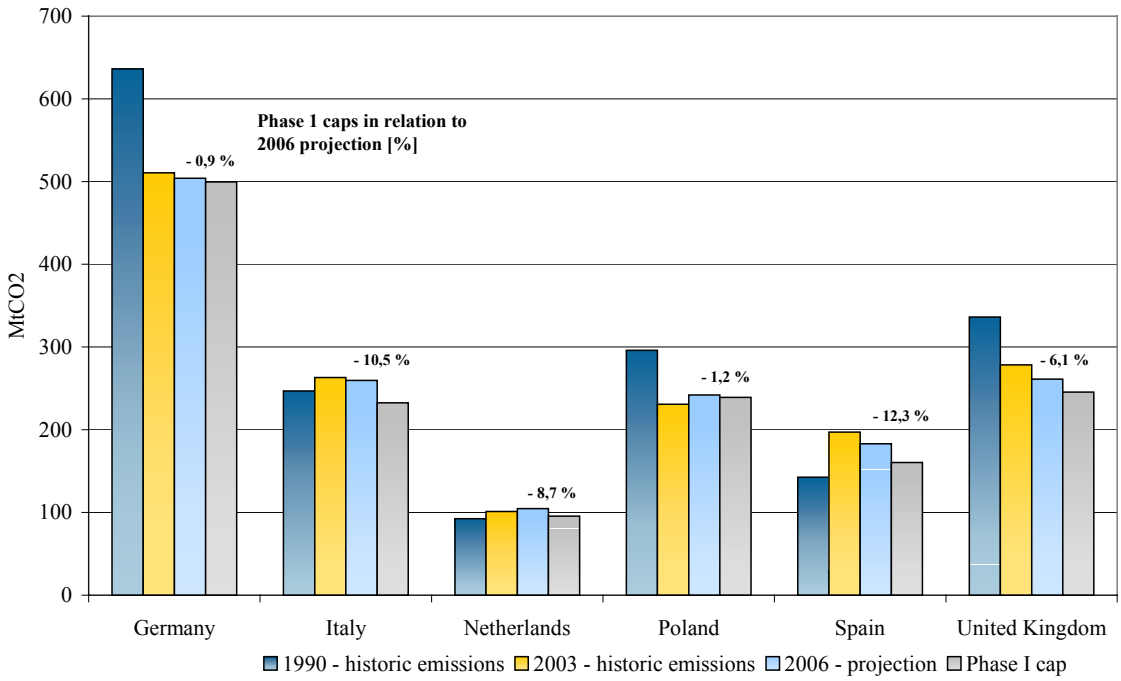
20 Source: http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/2761.php

21 We address the question of how to ensure that emissions decrease over time when we look at the way international and national targets have been incorporated (criterion 2 below).

4.6 The chart below (Figure 2) compares the allocation of each of the six countries against historic emissions[22] in the traded sector and projected business as usual emissions[23]. The figures show the difference between each country's Phase I cap and projected Phase I emissions.

4.7 It should be noted that when making comparisons of this sort, it is not always straightforward to compare like with like. For instance, the historic data available varies from country to country and often covers installations or point sources that are outside the scope of Phase I of the ETS. For the purposes of illustration here, we have used historic data provided in National Inventory reports as a published source of information that is reported on a consistent basis across different countries. However, as noted in the comments under Figure 2, this might introduce some inconsistency in emissions coverage. For this evaluation we have evaluated the criterion on the projections, which are tailored to cover the traded sector specifically, and therefore minimises this problem.

Figure 2 – Comparison of Phase I caps against historic and projected emissions



Source: ILEX
Notes: 1990 and 2003 – historic emissions: information from NAPs and National Inventory Reports (emissions from energy and industry which may include some installations that fall

22 Note: we have included 1990 emissions since this is the base year used for a majority of country targets. We have used the same year for all countries in this chart to ensure consistency. Throughout this document, however, it should be remembered that for Poland the base year for the Kyoto target is 1988.

23 Source: with-measures projections in http://reports.eea.eu.int/technical_report_2004_4/en/tab_content_RLR.

outside the scope of the Scheme). 2006 – projections from Electrowatt Ekono EU ETS model. Phase I cap – caps from Phase I National Allocation Plans.

4.8 Figure 2 shows how only one country will allow emissions to increase compared to recent (2003) historic emissions during Phase I. They have all applied some reduction compared to the projection of business as usual emissions, although some (such as Spain) are more ambitious than others (e.g. Poland).

4.9 On the basis of the assumptions presented here then, all these Phase I caps in the six countries meet the first criterion, in that all are driving emissions reductions beyond the projections of business as usual used here (see paragraph 4.5). We have rated the effort implied by the Spanish and Italian caps as 'good', by the UK and the Netherlands as 'average' and Germany and Poland as 'weak' for our summary evaluation set out in Table 13 (on page 37).

2. Level of the cap: in line with Kyoto and national targets

4.10 In order to meet our second criterion, the Phase I caps would need to be at a level which, when considered alongside expectations and targets for the non-traded sector, will result in stated national emissions targets and Kyoto targets being achieved.

4.11 One of the difficulties in evaluating performance against this criterion for Phase 1 of the scheme is that the Kyoto targets:

- cover six greenhouse gases (not just carbon dioxide as the EU ETS does);
- cover national emissions rather than just those from the traded sector; and
- are targets for 2008-12 (the timescale of Phase II rather than Phase I) and therefore the targets do not directly apply to Phase I.

4.12 Similarly, the time frame for any national targets is often different to Phase I. The emissions and sectors covered by national targets are also sometimes different to the Phase I EU ETS coverage.

4.13 We have considered how each NAP explains the cap puts that country 'on a path' to Kyoto and national targets. Table 7 sets out our findings for each.

Table 7 – Extent to which Kyoto and national targets were considered in the cap calculation

Country	Kyoto target	National target
Germany	Together, the caps for the traded sector, households, transport and the commercial sector sum to a total cap which is arguably in line with Kyoto compliance.	The National target for a 25% reduction in CO_2 emissions compared to 1990 levels was cancelled in 2004. There are no other national targets.

Country	Kyoto target	National target
Italy	It was considered inappropriate for the caps to be linked to the Kyoto target directly. Many of the measures to meet the Kyoto target will be imposed outside the traded sector. This is an explicit decision of the Italian Government	National emissions targets are not explicitly included in the NAP.
The Netherlands	The stated rationale behind the level of the cap is to put industry in line with Kyoto.	National targets were not considered explicitly – the national emissions target is the same as the Kyoto target.
Poland	The Kyoto target was taken into account in all NAP versions. Since Poland is on course to meet its Kyoto obligations, the target does not require a reduction as compared to projections.	Only the Kyoto target was taken into account.
Spain	It was decided that stabilizing the emissions to the average level of the historical emissions in 2000-2002 was enough to put EU ETS sectors to the path of Kyoto.	There are no national targets for carbon dioxide emissions in the traded sector in Spain.
UK	The UK Kyoto target results in emissions above BAU and therefore, by setting a cap below BAU, the UK cap is in line with Kyoto.	The UK national goal (a 20% reduction on 1990 levels by 2010) was considered in the Climate Change Programme Review, which determined the abatement contribution of the traded sector.

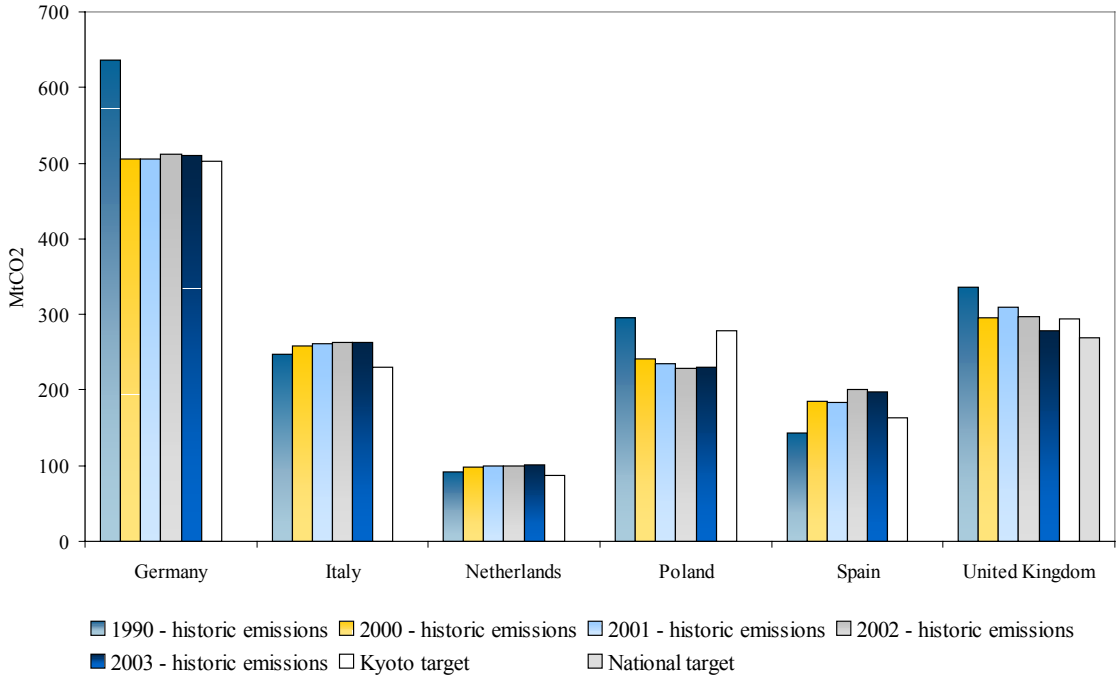
Source: Avanzi, ESC, ILEX, ILEX Iberia, Öko

4.14 In order to provide a rating under this criterion, we have also considered whether the recent emissions trend appears to be in line with the Kyoto (and national) target or whether a country will have significant work to do to meet it.

4.15 This chart illustrates whether emissions have fallen over recent years, or whether they are increasing. It also shows the level of emissions that result if we take the Kyoto commitment (using the burden sharing agreement for five of the six countries) and apply this to emissions in the base year. For the UK Figure 3 also shows emissions using the national target[24] calculated in a similar way (national targets either do not exist or were not considered in the development of the Phase I NAP in other countries, see Table 7). We have not included the cap level in this part of the evaluation, since the coverage of the historic data is not the same as the traded sector.

[24] The UK national target applies to 2010, the mid year of Phase II.

Figure 3 – Historic emissions compared to emissions levels reflecting Kyoto and national reduction commitments



Notes: Data sources are the same as for Figure 2. We have used information from the NAPs wherever possible. For five of the countries, the Kyoto target is constructed by multiplying emissions in base year (1990) by the burden sharing commitments. For Poland, we have applied the Kyoto target to base year emissions (1998). UK national target constructed by applying 20% reduction to 1990 emissions.

4.16 We have used the trends in the chart, combined with whether or not the cap calculation took the targets into account to inform the ratings set out below:

- Germany: the incorporated Kyoto target was considered in the cap calculation. Recent emissions show an upward trend which would need to be corrected to be in line with Kyoto: average;
- Italy: the link to the Kyoto target was not considered in the cap calculation. Recent emissions show an upward trend which would need to be corrected to be in line with Kyoto: weak;
- The Netherlands: the link to Kyoto was considered in the cap calculation. Recent emissions show an upward trend which would need to be corrected to be in line with Kyoto: average;
- Poland: the link to Kyoto was considered in the cap calculation. Recent emissions show an downward trend which is well below the Kyoto target: good;
- Spain: the Kyoto target was not an explicit assumption in the cap calculation (which stabilises emissions at historic levels). In light of projections of emissions for the traded sector, the Phase I cap would need to be more stringent to put the traded sector on a path to Kyoto: weak; and

- United Kingdom: the Kyoto target was considered in the cap calculation, as was the national target. Recent emissions will need to be reduced to be in line with the national target during Phase II: average.

3. Economic efficiency: achieve abatement at least cost

4.17 Our third criterion requires that a cap ensures that the abatement required to meet the international and national goals above is balanced between the traded and non-traded sector appropriately. If too great a burden is placed on the traded sector, it will cost more to achieve the same level of emissions reductions than would have been the case had the non-traded sector played a greater role.

4.18 For the purpose of evaluating the Phase I NAP, we have based our analysis on the information provided in the NAP documents themselves. The NAPs do not provide consistent information about the assumptions that made to assess the abatement costs in different sectors. For the purposes of the evaluation here then, we have been able to consider how the contribution of the non-traded sector is described rather than the validity of the assumptions. For this analysis, if a NAP has set out and explained how the differential costs of abatement are taken into account, it does at least go some way to ensuring that the burden is spread appropriately between sectors.

4.19 Table 8 sets out the approach used in each country. We consider that although a majority of the countries mentioned the contribution of the non-traded sector, the assumptions made regarding it are not always very clear (hence the 'average' rating). Therefore to achieve a 'good' rating here, the Member State must have quantified the expected effort of the non-traded sector.

4.20 We consider that, although all six countries met the relevant criteria in the Directive (see paragraph 3.10), only the Netherlands, really sets out and quantifies the expected contribution from the non-traded sectors in a way that allowed their contribution to be compared to the traded sector.

Table 8 – Approach taken to consider costs of abatement in the traded and non-traded sector in each country

Country	Our view	Evaluation
Germany	The traded sector, households, transport and the commercial sector each have their own cap to reach. The abatement costs and potentials are not directly mentioned.	Weak
Italy	The total quantity of allowances to be allocated represents about 43% of overall emissions. This is a very similar proportion to the current contribution of emissions from covered installations.	Weak
The Netherlands	All the non-traded sectors (Agriculture, Traffic and transport, built environment, and other greenhouse gases) had there own individual targets in order to meet the total Kyoto target. The sectors are treated separately, so that every sector has to do its part for reaching the target.	Good

Country	Our view	Evaluation
Poland	Instead of abatement potential of the non traded sectors, NAP-1 forecasted limited emissions growth from these sectors, based on the assumption of the growing energy intensity of production in sectors outside trading system and in services (due to expected increases in electricity consumption). Transport was singled out as a sector with expected significant emissions growth.	Average
Spain	Emissions from the non-traded sector were considered in calculating the path for Spain to reach its Kyoto target. How that information is used in the calculation of the Phase I cap is not absolutely clear.	Average
UK	The use of bottom up data[25] was designed to ensure that the sector caps matched the emissions needs of those installations covered by the scheme. The NAP included an annex that listed policies and measures in the UK climate change program (which cover the traded and non traded sector).	Average

Source: Avanzi, ESC, ILEX, ILEX Iberia, Öko

Notes: Good – targets for non-traded sector explained; Average – costs of abatement outside traded sector mentioned but not explained in detail; Weak – limited consideration of non-traded sector contribution.

4.21 One of the concerns that have been raised is that although policies and measures might be in place to achieve abatement in the non-traded sector, these measures might not deliver. WWF has expressed particular concern that abatement may be more difficult to achieve in the non-traded sector than in the traded sector (even if abatement could be made relatively cheaply there e.g. energy efficiency measures). We acknowledge that it can be more difficult to change behaviour in, for instance, the domestic sector than industrial sectors. We consider that this should be factored into the estimates of the abatement that each measure is expected to deliver. The information provided in the NAPs is not sufficient for us to make a judgement on the extent to which different countries have taken this into account for this evaluation.

4. Fairness: take into account the differences between countries

4.22 Our fourth criterion takes into account the fact that the cost of abatement and the potential to reduce emissions varies from country to country. This is one of the reasons that we would not expect the Phase I caps to reflect a uniform level of emissions reduction in the six countries.

4.23 One of the difficulties in evaluating all of the criteria under the heading of 'fairness' is that every stakeholder's view of what is fair will differ. For the purposes of evaluating this criterion in this report, we have considered whether the

[25] Installation-level information collected from operators was used to inform decision makers of the emissions sources covered by the scheme.

levels of reduction broadly reflect the distribution of abatement required under the burden sharing agreement (and the Kyoto target for Poland)[26].

4.24 We have taken this approach because the Kyoto targets and burden sharing agreement have, at some level, been agreed to be 'fair' and take into account the differences between countries. Although they apply to all greenhouse gases rather than just those sources covered by the EU ETS (see paragraph 4.11) we have used them to assess at a high level in which countries abatement might go beyond the requirements under these agreements.

4.25 From Table 9, we can see that even though Spain already has the greatest increase in allowances under the burden sharing agreement, its allows traded sector emissions to increase still further.

Table 9 – Comparison of reductions on base year implied under international targets and under Phase I caps

Country	Emissions target under international targets (change on base year)	Difference between Phase I cap and base year (change on base year)	Difference between Phase I cap and estimate of traded sector emissions under international targets	Evaluation
Germany	-21%	-21%	Similar to burden sharing	Average
Italy	-6.5%	+11%	Allows increase rather than decrease	Weak
The Netherlands	-6%	-1%	Cap does not reflect reduction required under burden sharing	Weak
Poland	-6%	-31%	Reduction beyond burden sharing	Good
Spain	+15%	+34%	Allows increase beyond increase in burden sharing	Weak
UK	-12.5%	+17%	Cap does not reflect reduction required under burden sharing	Weak

Source: Avanzi, ESC, ILEX, ILEX Iberia, Öko

Notes: Good: cap implies greater reduction that target; Weak: cap implies smaller reduction than target. Target base year for Poland 1988, 1990 for all other countries. We used information on historic emissions from the NAPs where it was available. Where it was not (for Italy, Poland and the UK), we assumed that the traded sector emitted the same proportion of total national emissions as in the nearest year for which we do have emissions data split between the traded and non-traded sectors.

[26] It should be noted that Poland is not covered by the EU burden sharing under Kyoto since it joined the EU in 2004. We understand that this is one of the fundamental reasons for the prolonged negotiations of the National Allocation Plan.

5. Fairness: take into account the differences between sectors

4.26 In our analysis we have also considered whether or not the Phase I caps take into account the differential costs and potential for abatement in different sectors, by concentrating on the power sector as an example.

4.27 The power sector contributes the majority of emissions in the EU ETS (approximately 60% of the total emissions captured in Phase I, across all EU countries).

4.28 For the purposes of this evaluation, in order to assess how closely aligned the sector cap is to the expected emissions of the installations captured in it, i.e. how well the NAP has taken into account the characteristics of the sector, we have compared the sector cap against business as usual projections.

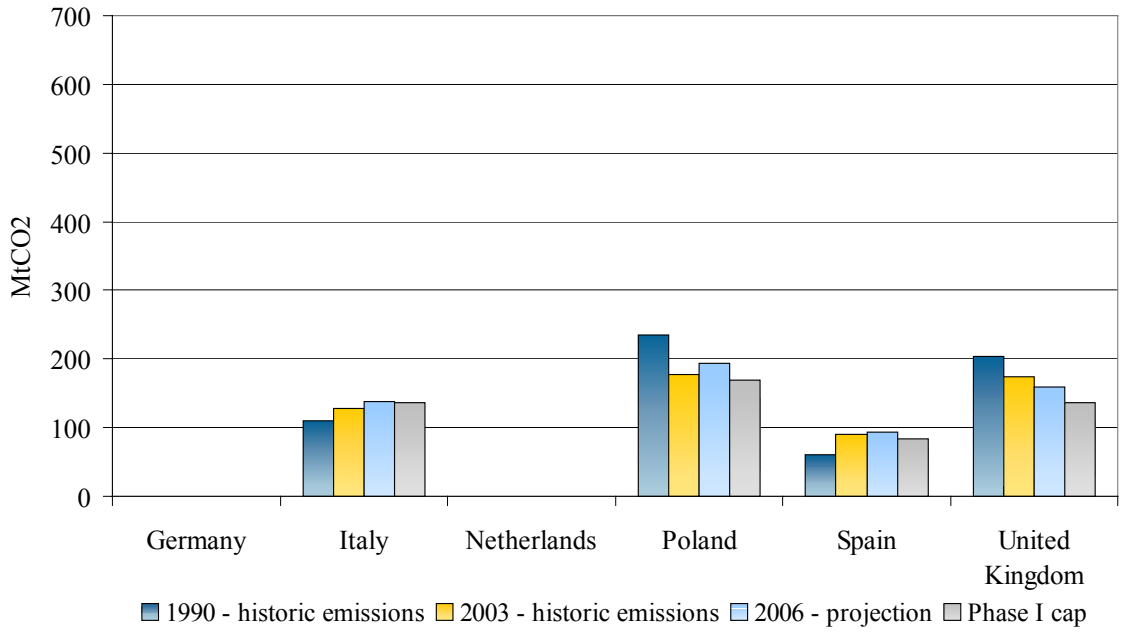
4.29 It should be noted that this is not the same as asking whether the NAPs require the maximum possible level of abatement from different sectors, rather that they have at least assessed the contribution that could be expected from the power sector in particular. It would be possible to construct scenarios for lower (or indeed higher) levels of emissions from these installations, which would then affect our rating of the NAPs below. The key question for fairness though is whether or not the differences in potential for various sectors to abate has been considered and incorporated. We have looked at questions of whether an appropriate number of allowances have been issued under the criteria concerning the level of the cap above.

4.30 This is a more straightforward task in those countries (such as Spain and the UK) that determine an allocation to this sector. We have not been able to perform this evaluation for those countries that do not set a cap for a power sector defined in their NAPs (Germany and the Netherlands).

4.31 Figure 4 shows how the burden placed on the power sector in Phase I varies significantly from country to country. In the UK and Spain, the power sector has been allocated allowances below business as usual projections (although, as noted above, it would be possible to construct scenarios with lower (or higher) levels of emissions). In other countries, operators have been allocated in line with business as usual projections (e.g. Italy).

4.32 In our view then, given the focus of this report on the power sector, we consider that Poland, Spain and the UK have taken into account the abatement potential of the power sector (and therefore achieve a rating of 'good' against this criterion). Italy has allocated more closely in line with need and therefore achieves a rating of 'average'. As explained above, we have not been able to evaluate the allocation to the Netherlands and Germany.

Figure 4 – Comparison of power sector allocations against historic and projected emissions



Source: ILEX

Notes: 2003 – historic emissions: from National Inventory Reports (NIRs), Poland data 2002. 2006 – projection: Poland and Spain from the NAP. UK based on an interpolation of projections for 2006 and 2010 (from NAP). For Italy the value is an interpolation of the historical emissions for 2003 and a projection for 2010 (from NAP). Phase I cap: the actual allocation.

6. Transparency: clearly documented methodology

4.33 In order to assess whether a cap meets any or all of the criteria established above, sufficient information should be available on which to be able to make such a judgement.

4.34 For each Member State, the most important source of information about their cap is their National Allocation Plan, list of installations and any supporting documentation. The format and detail of these documents is guided by the Directive. Each of the countries that we have looked at has chosen to report different information and to present it in a variety of ways. This makes it difficult to get to the bottom of the details of how the caps were calculated and also to be certain that we are comparing like with like.

4.35 In our view, the actual cap calculation is not fully transparent in any of the countries. Table 10 summarises the information provided in each NAP and how comprehensively the cap setting process is explained.

Table 10 – Level of detail regarding cap provided in NAP

Country	Our view	Evaluation
Germany	All formulae are given in the NAP. However, it is not simple to understand the differences between the (necessary) top down and bottom up approaches.	Average
Italy	Since the Kyoto target is not explicitly taken into account in the cap, it is difficult to follow the basis for the Phase I cap level. Some methodological issues are not explained in detail, especially the cap level's definition and also for allocations at activity level. For instance, the NAP only includes projections for one year.	Weak
The Netherlands	The assumptions of the top down and bottom up analyses are not clear and it is not immediately obvious how the final cap figure was derived. For instance, as is the case for Italy, only one year of emissions projections were provided and the assumptions behind the projections were not explained very thoroughly.	Weak
Poland	The main principle of calculating the national cap as indicated by the Commission is clear but as the subsequent NAP versions changed, the level of allocations assigned to the reserve, and the principles of calculating emissions for the individual installation groups are not sufficiently explained.	Weak
Spain	Spain decided to allocate 157.86MtCO_2/a to existing installations, which is the average emission in 2000-2002. It's not transparent how they decided that this was a sufficient allocation to be on the path to Kyoto.	Average
UK	It is hard to equate the final cap to the original stated methodology. There are a large number of sub-sectors and it is not straightforward to determine how the allocations to each of these have been calculated. The UK did provide relatively detailed information on its emissions projections compared to other Member States. However, given the revisions to them and the subsequent rejection of the associated cap amendment by the Commission, it could be argued that the process lacked transparency.	Average

Source: Avanzi, ESC, ILEX, ILEX Iberia, Öko

Notes: Good – the detailed methodology can be determined through close reading of the NAP; Average – the high-level principles can be discerned from the NAP, but it is difficult to understand the details; Weak – it is difficult to understand even the high-level principles on which the cap calculation is based.

7. Transparency: include consultation with all interested parties

4.36 We have also considered how consultation was used in Phase I. One of the requirements of the Directive is that public comment be considered in finalising a country's NAP (although not its cap explicitly). However, there is a difference between opening up the issues to public comment once decisions have effectively been finalised and taking on board the views of both EU ETS operators and other interested parties as an integral part of the decision-making process.

4.37 In order to meet this criterion, the consultation should:

- be open to all interested parties;

- allow time for stakeholders to understand the issues and provide comment; and
- be early enough that stakeholders' views can feed into the decision making process.

4.38 In addition, all documents should be published on a website and so be equally accessible to all interested parties.

4.39 Table 11 explains the approach to consultation used in each country. It is a difficult area to evaluate since, as is the case with fairness, every stakeholder is likely to have a different view of how the consultation process worked from their perspective, influenced to some extent by how closely the eventual outcome of the process matches their view.

4.40 We have therefore taken a simple approach. Where government opened the decisions up for more than one round of formal consultation and published documents on the internet (possibly on more than one website), we consider this to be average.

4.41 Where either the opportunity for formal comment was less than this, or industry meetings were focussed on a small number of stakeholders, or information was not published, we consider the approach to be 'weak' for the purposes of this evaluation.

4.42 Where all stakeholders were given both formal and informal opportunities to comment, the documents were published on a single website and, in our view, the process by which stakeholders could comment was made public, we have rated the approach as 'good'.

Table 11 – Cap consultation process in each country

Country	Our view	Evaluation
Germany	Ongoing discussion and debate at the working group AGE[27] (whose membership included politicians, economists, administrators, the Federal States, NGOs and scientists) informed the NAP process. Documents were not however published on a dedicated website.	Weak
Italy	The National Allocation Plan was developed taking into account the outcomes of several meetings organized with industrial associations and operators. Other stakeholders could only provide their comments to the draft documents that were posted on the Ministry's web site.	Weak

[27] 'Emissionshandel zur Bekämpfung des Treibhauseffektes' (Emissions trading to combat the greenhouse effect).

Country	Our view	Evaluation
The Netherlands	The Dutch Government used the views of stakeholders both to improve the data on which calculations were based (for instance, following feedback on the growth factors to use) and also to inform their decisions on the detailed allocation methodology. Documents are published on a single website.	Good
Poland	The Ministry of Environment consulted with a range of individual organisations that operate installations covered by the scheme. NGOs were invited to attend only one meeting in December 2004. All the subsequent NAP versions (except for the interim NAP-5, internally consulted with the power sector only), were posted on the Ministry of Environment website	Weak
Spain	The government changed in March, and the new government started an informal consultation process with sectors and stakeholders. They presented a document with the criteria to prepare the NAP in June and the final draft in July for formal consultation. Documents are published on a single website.	Average
UK	Government conducted five rounds of formal consultation on NAP issues, which were open to all stakeholders. Industry meetings and discussions were also ongoing throughout the decision-making process. Informal meetings with NGOs were arranged on an ad-hoc basis. Documents were published on the websites of the relevant government departments and regulator. However, the government was sometimes slow to publish information or inform operators of how the timetable and picture was changing.	Average

Source: Avanzi, ESC, ILEX, ILEX Iberia, Öko

Notes: Good: all stakeholders were provided with opportunity to comment on the cap decision before it was finalised; Average: consultation was focussed on EU ETS operators, but throughout the cap process; Weak: stakeholders were not engaged in a transparent way until the end of the cap process.

4.43 One of the key concerns of the Phase I process was the extent to which stakeholders were able to influence the allocation process outside the formal consultation route. It is difficult to tell how much an impact industry lobbying had on the cap levels, either through adjustment to the inputs to projections or changing the abatement burden placed on the traded sector. Given that, by definition, limited comparable information is available on this impact, we have not attempted to evaluate it here.

8. Transparency: be set early

4.44 Our final criterion is that the total number of allowances should be set as soon as possible. This is in order to allow operators of installations in the scheme to make the necessary operational and investment decisions for the scheme to impact on their emissions. In addition, indications of the likely cap level in future phases of the Scheme allow operators to plan ahead and form a view of the future cap level.

4.45 The Directive required that the Phase I NAPs, including the cap level, be finalised by March 2004; however, as set out in Table 12 below, very few Member States achieved that deadline.

4.46 In order to evaluate each country against this criterion, we have taken into account the date on which the total number of allowances was approved by the Commission and accepted by the Member State. (Although it has taken some countries much longer to decide how to distribute this cap amongst installations, this aspect of transparency will be considered in the accompanying structural report).

4.47 We have also noted whether or not the NAP indicates the likely level of effort required from the scheme in future Phases. 'Yes' means either that a government explicitly showed how the burden would fall on the traded sector (e.g. Italy) or that it provided some quantified indication of the measures it will take to meet the Kyoto target in Phase II (e.g. Spain). 'No' means that there is no indication of the level of ambition (i.e. share of the abatement burden) for the traded sector in Phase II and beyond.

Table 12 – Timing of cap decisions

Country	Indication of cap levels for Phase II	Timing of cap decision	Evaluation
Germany	Yes	There were two iterations of the cap: BMUs draft as of 29 January.2004 and the final version "Minister's compromise" of 31 March 2004. So, the final cap was decided very early compared to many other countries.	Average
Italy	No	There were three different levels of cap before the final allocation of allowances accepted by the European Commission. The original Phase I total in July 2004 was 722MtCO_2. This was increased to 766MtCO_2 under the 'Integration to NAP' in February 2005, but reduced following the Commission's decision in May 2005, to 697MtCO_2. The final NAP will be based on this amount approved by the Commission.	Weak
The Netherlands	Yes	There were three iterations of the NAP – the Government published one for consultation in February 2004, increased it slightly following public consultation in April 2004 and the Commission then approved a lower, final amount in June 2005.	Average

Country	Indication of cap levels for Phase II	Timing of cap decision	Evaluation
Poland	No	There have been five iterations of the NAP to date and it is not yet finalised. The first, NAP-1 was published in September 2004, with a total cap of 858MtCO_2. There have been three more NAPs: May 2005, June 2005 and again at the end of June 2005. The Ministry of Environment has published the draft Regulation of the Council of Ministers approving the fifth NAP in August. This version was supposed to provide a final allocation on the level of installations but it is not clear when will it enter into force. All of these have been based on the same lower amount of 717MtCO_2, as approved by the Commission.	Weak
Spain	Yes	Two versions of the NAP were published, Royal Decree 1866/2004 published on the 6th of September 2004 followed by Royal Decree 60/2005 published on the 21st of January 2005. The Spanish plan was approved with some conditions in December 2004.	Average
UK	No	The first NAP was published for consultation in January 2004 (238.2MtCO_2 per annum of Phase I). This was updated then submitted to the Commission in May 2004 (245MtCO_2 per annum). An adjustment to the cap level was proposed in November 2004 (252MtCO_2 per annum). The Commission approved the final NAP in May 2005, which is based on the unadjusted amount (245MtCO_2 per annum).	Weak

Source: Avanzi, ESC, ILEX, ILEX Iberia, Öko

Notes: Good: final total approved and agreed within Directive timescales; Average: final total approved and agreed prior to start of phase; Weak: final total approved and agreed after the start of the Phase.

Summary evaluation of caps in Phase I

4.48 We have taken into account both the level of the caps and also the way in which they have been set to determine whether we think they can be considered environmentally effective. Table 13 overleaf summarises our evaluation against each of the criteria. We also set out the key points from Phase I that stand out in each of the six countries in Table 14.

Table 13 – Summary evaluation of the environmental effectiveness of the Phase I caps for the six Member States

Country	1 Level: beyond BAU	2 Level: in line with targets	3 Economic efficiency: least cost abatement	4 Fairness: differences between countries	5 Fairness: differences between sectors	6 Transparency: clearly documented methodology	7 Transparency: consultation with stakeholders	8 Transparency: be set early
Germany	☹	😐	☹	😐	n/a	😐	☹	😐
Italy	☺	☹	☹	☹	😐	☹	☹	☹
Netherlands	😐	😐	☺	☹	n/a	☹	☺	😐
Poland	☹	☺	😐	☺	☺	☹	☹	☹
Spain	☺	☹	😐	☹	☺	😐	😐	😐
UK	😐	😐	😐	☹	☺	😐	😐	☹

Key: ☺ good, 😐 average, ☹ weak, n/a not applicable

Source: Avanzi, ESC, ILEX, ILEX Iberia, Öko

Table 14 – Key issues arising from our analysis of the caps

Country	Our view
Germany	The Phase I cap appears lax if it is compared to BAU. In addition, the relative costs of abatement were not taken into account. The bargaining approach to cap setting that was used limited the opportunity for stakeholder input. The cap level was, however, set early compared to other countries and the methodology is relatively clearly documented.
Italy	The final cap in Italy is relatively stringent compared to BAU. However, it does not take into account the Kyoto target directly. The costs of abatement were not incorporated into the cap and the cap is not in line with Italy's commitment under the burden sharing agreement. The cap does take into account differences between sectors to some extent. The stakeholder consultation process was weaker than that in other countries.
The Netherlands	The cap is broadly in line with projected emissions, rather than going beyond them. The methodology sets out how Kyoto will be met and takes into account the relative costs of abatement between sectors. However the commitment under the burden sharing agreement is not reflected and the details of the cap calculation methodology are not presented. The Dutch approach to stakeholder consultation was transparent and the cap level was set relatively early.
Poland	The Polish cap level seems high compared to some projections of BAU, even after the Commission adjustment. However, the cap is still below the level implied by Poland's Kyoto's commitment. The cap does not take into account the costs of abatement but does account for the differences between sectors. The prolonged negotiations in Poland have meant the cap setting process has not been transparent, although the total number of allowances was set relatively early.
Spain	The Phase I cap stabilises traded sector emissions at historical levels (the average of 2000 to 2002). The resulting cap is below projected emission (which are expected to rise), however it is not in line with either the Kyoto target or the burden sharing agreement. Differences between sectors have been taken into account. The approach to stakeholder consultation was relatively transparent and the cap calculation methodology can largely be understood from the documentation[28].
UK	The UK cap is broadly in line with both business as usual and the Kyoto target. However, it is arguably not stringent when compared to the reduction implied by the national target. The contribution of other policies and measures included in the UK Climate Change Programme (which covers installations in the non-traded sector as well) was listed in an appendix to the NAP. The cap set for the power sector reflects the differences between sectors. The supporting documentation is relatively transparent and a similar approach to consultation was used to that in other countries. The cap definition was linked to emission projections, which meant that it changed when the projections changed. The UK cap was set late.

Source: Avanzi, ESC, ILEX, ILEX Iberia, Öko

[28] A separate report 'The environmental effectiveness and economic efficiency of the European Union Emissions Trading Scheme: Structural aspects of the allocation' authored by the Öko-Institut evaluates the way that these allowances have been distributed to individual installations.

4.49 In summary, while none of the cap methodologies meet all our criteria. There are however some good examples from Phase I. For instance:

- the consultation process in the Netherlands was inclusive;
- the UK reflected the characteristics of different sectors by placing the greatest abatement burden on the power sector; and
- in Spain and Italy, the cap was set below business as usual projections of emissions.

4.50 However, the environmental effectiveness of each cap could be improved by addressing the aspects of the criteria that we have evaluated here (as illustrated in Table 13). We have set out the key lessons learned and recommendations below. We have also identified and summarised areas for improvement in each of the countries in Section 7 (page 57).

Lessons learned and recommendations

4.51 The evaluation above shows how different countries set their cap for Phase I in a range of different ways. The key lessons that we have learned from Phase I are those set out below.

4.52 One of the things that we have seen is how difficult it is to compare different NAPs when each is presented in a different way, contains different information and explains each aspect of the cap decision differently. Improved co-ordination of the way that information is presented is a key consideration for Phase II (something that we explore in more detail in the section on harmonisation below).

Level of cap

- The total number of allowances should be fixed as soon as possible and be left unchanged, as was the case in Germany.
- The cap level should be based on a clear and transparent methodology – we discuss our preferred approach below.
- The relationship between the cap level and the Kyoto (and national) targets should be explained – for instance, the UK NAP includes a chart which illustrates trend line emissions based on Kyoto and the national target and where the cap sits in relation to these.

Economic efficiency

- The implied abatement burden on the non-traded sector should be set out clearly and justified – for instance information published for the Netherlands allows stakeholders to build up a picture of total national emissions taking into account all the different sectors.

Fairness

- The Commission evaluation of the NAPs should include an assessment of whether and how the contribution of the non-traded sector has been incorporated into each Member State's cap level.
- The Commission approval process should consider the burden that each Member State has placed on its traded sector in the light of the caps set by other Member States.

Transparency

- The assumptions behind the cap calculation should be presented explicitly.
- Where projections are used, they should be agreed at the start of the process, rather than changed as debate develops.
- The cap definition should not be linked to projections, but rather a historic level that is fixed and will not change over time.
- Projections will continue to be used to evaluate the level of 'need' of the traded sector and so to ensure that the cap level is consistent with the Directive criteria. In order to ensure that the cap is fixed early, however, it is necessary to ensure that it is linked either to historic emissions or a fixed absolute amount, rather than to a projected level.
- Consultation should be formalised both to increase the transparency of the way that governments take into account stakeholder views and to ensure that all stakeholders are given a comparable opportunity to input at an early stage.
- Where possible, the Commission should set guidelines to ensure that each Member State follows minimum requirements for consultation with interested parties.
- All relevant information should be published on a single website to ensure equal access to information for all interested parties.
- Data should be published to allow stakeholders to understand the derivation of the final figure.

4.53 We suggest that guidance from the Commission to standardise the information provided in the NAPs could help stakeholders to evaluate the NAPs and compare the approaches in different countries more easily. Without access to this information, it is difficult to evaluate the environmental effectiveness of the scheme.

5. PRINCIPLES FOR PHASE II CAPS

Challenges for decision makers in Phase II

Demands on the Phase II caps

5.1 Phase II of the Scheme is considerably different to the pilot Phase:

- the scheme runs for five years rather than three – the rules will apply (to more installations if the scope of the scheme is expanded at all) for longer;
- Member States can decide to unilaterally extend the Scheme to more sectors and gases;
- operators have had earlier warning of this Phase and its possible impacts;
- governments and stakeholders have experience of developing (and to a limited extent operating under) the Phase I rules;
- the Phase I process has set a precedent in many ways – industry is now aware of the effect that their lobbying can have;
- many Member States have collected data and so have a better understanding of the installations covered by the scheme; and
- the Kyoto targets are binding – national governments will need to ensure that total national emissions do not exceed the number of assigned amount units (AAUs) allocated to them, so there will be strong incentives to ensure that both traded and non-traded sectors are brought in line with the target.

5.2 These factors point towards stronger NAPs for Phase II.

5.3 However one key constraint remains: time. Once again, for Phase II, governments are making decisions on the cap level and allocation methodology simultaneously.

5.4 It would be unreasonable to expect that political considerations will not continue to affect the way that different countries implement the Directive. Especially where significant abatement is required in Phase II, governments and decision makers will come under even greater lobbying pressure than for Phase I.

Considerations in setting a cap in Phase II

5.5 Each government will take into account the issues set out below when deriving its Phase II caps.

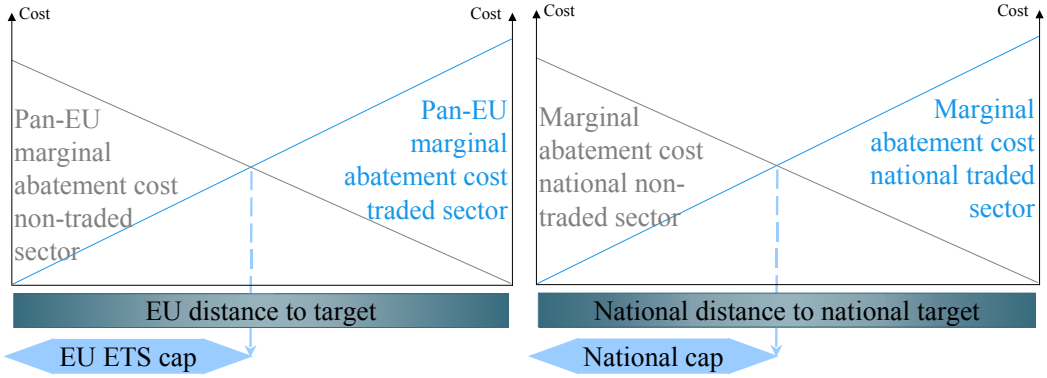
Who bears the cost

5.6 The EU ETS captures only a subset of the installations and gases on which Kyoto targets (and national targets) are based. As a result, governments must share the burden of reaching the target between the traded sector (those installations captured under the scheme) and the non-traded sector.

Economic efficiency

5.7 In theory, the appropriate balance would be to set the EU ETS cap at the point where the marginal cost of abatement in both of these groups of installations (in the traded and non-traded sectors) is equalised (shown on the left of Figure 5).

Figure 5 – Splitting abatement between the traded and non-traded sector



Source: ILEX

5.8 In practice, Member States need to take into account a range of issues at the national level as the NAPs are developed. One of these is how the costs of abatement in the traded sector relate to those in the non-traded sector at a national level (the right-hand diagram in Figure 5). Some other issues are highlighted below.

International competitiveness

5.9 First of all, each Member State is developing its own National Allocation Pan, independent of the other countries meeting the EU wide target. The burden sharing agreement means that much of the bargaining over the balance of effort has already taken place. However, each country's national government has an incentive to do as well out of the scheme as it can by minimising the abatement burden that it places on its industry and allocating proportionately at least as many allowances to national companies as do the governments in competitor countries.

5.10 Competitiveness concerns, such as the impact on the costs of particular industries and on international investment, are at the forefront of decision-makers' minds. Efforts to incorporate industry views have also prompted observers to ask how much of the cap is set by analysis of the fundamentals and how much through lobbying power.

International emissions targets

5.11 Since the first Kyoto target commitment period is also not until the second Phase of the scheme, it is difficult to show whether caps set for the first Phase really put the traded sector on track to meet Kyoto. Caps for Phase II will need to be in line with the Kyoto target given that the timeframes are the same. Even in the second

phase, whether the cap is as effective as it could have been will depend on other policy measures adopted to constrain emissions.

National goals

5.12 Member states that have set national targets for emissions will also consider these when setting caps for Phase II. For instance, the UK has set a domestic target for a 20% reduction on 1990 emissions by 2010. Decision makers will consider how much of the burden to meet this target should be placed on the traded sector and so incorporated into the cap calculations.

Availability of data

5.13 When considering the abatement potential of the installations in the scheme, abatement cost calculations are subject to a wide range of uncertainties and comprehensive data are difficult to find. Estimates of projected and expected emissions during the phase are therefore inherently uncertain.

Political constraints

5.14 Governments also face political considerations when deciding how to implement the EU ETS. In order for the introduction of such a scheme to be accepted by industry, the burden placed on them must be perceived to be fair. Each stakeholder's perception of fairness will be different, depending on their environmental goals, the investments they may have made already and the structure of their industry. The short-term costs that will be incurred by individuals and Member States can obscure the longer-term value of environmental benefits.

Differential treatment of industries

5.15 There is therefore pressure for the cap level to take into account the particular circumstances of different operators and industries. Even within the constraints of the Directive, it is possible for governments to differentiate treatment in this way. The differential treatment of industries has caused the process for cap making in Phase I to become more and more complicated, often less transparent more and difficult to understand from the outside.

Timing

5.16 The Directive requirement that the EU ETS is divided into phases, together with its short time frame overall (only eight years), restricts the certainty that the current structure provides. The Commission approval process aims to ensure that all the countries involved stick to the rules. However, the timing of their decisions and the high level at which adjustments have been made at these times have resulted in prolonged uncertainty for many operators.

Beyond 2012

5.17 The rules and framework for the scheme are not yet in place beyond Phase II. As a result, decision makers will be balancing the need to take action to reduce

emissions today against uncertainties surrounding climate change policy in the future. Governments will also consider the extent to which Phase II might be considered to set a precedent for future phases. We discuss these issues further in Section 7 below.

Managing uncertainties

5.18 The Phase II NAPs will be finalised in 2006 and will determine allocations out to 2012. A wide range of factors could influence emissions levels within these timescales. Amongst other things, emissions in Phase II will depend on the rate of economic growth, the development of clean technologies and trends in energy use. Governments will take all these factors into account, when setting a cap.

5.19 In addition, since all Member States are setting their caps at the same time as each other, government will also need to manage uncertainties about the abatement burden other countries will place on their traded sector. Although decision makers will have an idea of the kinds of levels that caps might be set at elsewhere, there is no certainty until the other NAPs have been approved by the Commission.

Use of project mechanisms

5.20 The mechanisms to generate and accommodate credits generated through project mechanisms (Joint Implementation and also the Clean Development Mechanism) should be further developed by the start of Phase II. The Kyoto Protocol requires that the purchase of credits be supplemental to domestic action, however there are no hard and fast definitions for what supplemental might mean. As a result Governments will need to consider the extent to which they will allow operators to use certified emissions reductions (CERs) and emissions reduction units (ERUs) in the EU ETS and how they will be used at a national level to comply with the Kyoto targets.

Approaches available

5.21 We describe in Table 15 the range of approaches that are available to decision makers for setting caps, and then recommend a preferred methodology in terms of environmental effectiveness below (see paragraph 5.34).

5.22 The final methodology that a country uses will depend on how strongly it weights each consideration against the others. For instance, in some countries competitiveness issues might be considered more important than ensuring economic efficiency.

5.23 It is worth noting that in principle any of these approaches could result in the same level of cap (which is what we consider really drives the effectiveness of the scheme). However, since each method places different weight on the issues discussed above, it is unlikely that they will. Whether one will result in a higher or lower cap depends on the specific circumstances of the country and the assumptions made in the calculations.

Table 15 – Approaches to calculate a Phase II cap

			Marginal abatement cost	Equal cost burden	Distance to target	Proportional contribution	Bargaining
Description of approach			The cap level is set at that where the marginal cost of abatement both inside and outside the traded sector is equalised (see paragraph 5.7).	The cap level is set to equalise the expenditure on abatement required from each sector within a country or the same sector in different countries.	The cap is set at a level that reflects a predefined emissions target for the traded sector or progress towards it. This target could be either an international target (e.g. Kyoto) or a national target.	Emissions (and so the cap) in the traded sector are set as a proportion of total emissions (for this analysis, we assume this total is determined through a distance to target approach).	The cap level is defined through discussion, between e.g. different government departments, other regulatory bodies and stakeholders.
1	**Level:**	**cap beyond BAU emissions**	The resulting cap may be beyond BAU at the national level if this is the way total emissions are calculated. Even if total emissions are beyond BAU though, the allocation to the traded sector may be above or below that level. It will depend on whether it is more expensive to abate inside or outside the traded sector.	The resulting cap may be beyond BAU at the national level if this is the way total emissions are calculated. Even if total emissions are beyond BAU though, the allocation to each individual sector may be above or below that level. It will depend on whether it is more expensive to abate in one particular sector than another.	If the target requires emissions lower than BAU, this criterion would be met.	If the proportion of emissions assigned to the traded sector is based on history, then given this is likely to change in the future, the resulting cap could be higher or lower than BAU. If the target used to calculate total emissions is lower than BAU, this criterion would be met.	Whether the approach meets this criterion will depend on the relative bargaining position of each participant and the compromises reached. It is possible (although unlikely) that no consideration will be given to expected emissions in Phase II. The starting point could instead be either the Phase I cap or a historic emissions level, for instance.

			Marginal abatement cost	Equal cost burden	Distance to target	Proportional contribution	Bargaining
2	**Level:**	**in line with targets (for the traded sector)**	At the national level if total emissions are calculated based on the target, then the resulting cap will be in line with it. However, even if total emissions are in line with the target though, the allocation to the traded sector may be above or below that level. It will depend on whether it is more expensive to abate inside or outside the traded sector.	At the national level if total emissions are calculated based on the target, then the resulting cap will be in line with it. However, even if total emissions are in line with the target though, the allocation to each individual sector may be above or below that level. It will depend on whether it is more expensive to abate in one particular sector than another.	Yes, this approach should result in a cap that is in line with targets.	It could be argued that the cap and target are more likely to be aligned if the traded sector's share is taken as its share in the base year for the target. This will depend completely though on how the balance between emissions in the traded and non-traded sectors has varied over time in the particular country.	Again, a cap might meet this criterion, particularly if a pre-existing agreement such as a target is more acceptable to the participants than some other level. However, unless the target is considered explicitly, or aligns closely with one of the parties' bargaining positions, it is unlikely this criterion will be met.

			Marginal abatement cost	Equal cost burden	Distance to target	Proportional contribution	Bargaining
3	**Economic efficiency:**	**abatement at least cost**	Yes, this approach should result in a cap that is economically efficient.	No, not between sectors, since the abatement burden is not distributed on the basis of economic efficiency. Instead, the calculation places the abatement burden even in those sectors where abatement is expensive to achieve.	It depends on the way that the target was established. For instance, if the relative costs of abatement are considered explicitly, and the balance between costs of abatement inside and outside the ETS is the same as the balance of emissions, then this criterion could be met.	If the balance between costs of abatement inside and outside the ETS is the same as the balance of emissions, then this criterion would be met.	Analysis of the relative costs of abatement is data intensive and requires a range of assumptions to be made. It is quite possible that one or more parties will base their starting position on such an analysis. However, it is unlikely that two parties' analyses will result in the same level of cap and so therefore that this approach will result in a cap that is consistent with this criterion.
4	**Fairness:**	**differences between countries**	It will depend how the total number of allowances to allocate is determined. If it is based on some pre-agreed emissions level that takes into account the differences between countries, then it could meet this criterion.	It will depend how the total number of allowances to allocate is determined and whether the methodology is applied to achieve an equal level of expenditure across countries or within a country.	If the target already takes into account difference between countries (e.g. the Kyoto target), then this criterion could be met.	The proportion of total emissions that the traded sector contributes can be tailored to the specific country. However, whether or not this approach meets this criterion will depend to a larger extent on the way that the total number of allowances is determined.	If the participants represent interests beyond the Member State setting the cap, then it is more likely that the resulting cap will take into account the relative position of that particular Member State.

			Marginal abatement cost	Equal cost burden	Distance to target	Proportional contribution	Bargaining
5	**Fairness:**	**differences between sectors**	Yes, although it does depend on the way that abatement costs are analysed and the extent to which data and assumptions can be disaggregated. This approach lends itself to differentiation between sectors though.	No – the purpose of this approach is to equalise investment across sectors, regardless of their different characteristics.	It is possible that targets could be set for different sectors and aggregated to a sector cap. Given the relatively simplicity of a distance to target approach, the cap could be disaggregated between sectors relatively easily.	This approach could take into account differences between sectors, but only really in a high-level way (if, for instance the target on which it is based is disaggregated for different industries).	Yes, it is likely that this approach will result in differential treatment of sectors. However, whether the resulting caps are 'fair' will depend on the lobbying power of each of the sector representatives.
6	**Transparency:**	**clearly documented methodology**	The data intensity of this approach and the range of assumptions that must be made to employ it would require careful explanation to be transparent.	The calculation to work out the cost burden to distribute would be rather complicated to calculate and would be based on a large number of assumptions. The basis for the distribution could probably be simplified and based on published data.	We consider that the relative simplicity of this approach (particularly if pre-existing targets are used) means that this should be the easiest approach to explain clearly.	The high level approach is relatively straightforward and could therefore be clearly explained to stakeholders. Since emissions data are published, it should also be possible to make the basis for the proportional split readily available.	Depending on the nature of the compromises reached and also the basis for each party's input, this is likely to be one of the more difficult approaches to document transparently.

			Marginal abatement cost	Equal cost burden	Distance to target	Proportional contribution	Bargaining
7	**Transparency:**	**consultation with stakeholders**	Consultation with industry would be possible at every step of the process. However, its success would depend on how clearly the approach could be explained and whether it was feasible to take on board comments (for instance, changing assumptions to reflect responses could result in internal inconsistencies).	It would be possible to consult interested parties on the different steps to be taken. However this is a relatively complicated approach to explain, particularly if any attempt was made to distribute the burden between countries. The wide range of assumptions and data required to perform the calculations might require consultation on very detailed issues.	The scope for public comment on this cap approach is more likely to be limited under this approach (for instance, on the way that the total cap is distributed or how any target is shared between installations inside and outside the scheme). There is no reason that the consultation could not be conducted and facilitated as successfully as under the other approaches. In particular, the relative simplicity of the principle would be straightforward to present to stakeholders.	As in the distance to target approach, the scope for consultation may be less than under some of the other approaches. However, it should be possible to present the issues clearly to stakeholders.	This approach could either be very good for stakeholder consultation, or very poor. It depends on the way that the debate is structured and how the interests of all different stakeholders are included.

			Marginal abatement cost	Equal cost burden	Distance to target	Proportional contribution	Bargaining
8	**Transparency:**	**be set early**	The speed with which a decision can be made will depend both on the availability of data and modelling capability and also on the extent to which the approach is opened up to stakeholders for comment.	The speed with which a decision can be made will depend both on the availability of data and modelling capability and also on the extent to which the approach is opened up to stakeholders for comment.	If targets that are widely accepted are used, then it is possible that this approach could be finalised relatively quickly, particularly if the target is related to historic emissions rather than some sort of projection.	If the proportion is based on historic information and the targets have already been set and agreed, then it should be possible to determine the cap relatively quickly.	If there are only a small number of participants whose positions are relatively closely aligned, it is possible that this approach could result in an early cap decision. Prolonged discussions are more likely under this approach if there is a wide range of interest groups.

Source: ILEX

5.24 In order to compare these approaches, we have assumed that for Phase II each country will determine its cap on its own. We discuss scope for harmonisation of caps and agreements to co-operate on cap setting in the 'beyond 2012' section (section 7) of this document.

5.25 It is worth noting that it is unlikely any country will use a pure form of the approaches described here. It is more likely that each Member State will start with one approach but take into account a range of other factors (such as political concerns and other domestic policies). In addition, whatever the approach a Member State chooses for its NAP, the Commission approval process introduces some degree of bargaining.

5.26 We summarise some of the detailed evaluation from the table in the text below.

Marginal abatement cost

5.27 The main advantage of the marginal abatement cost approach is that it ensures that the total number of allowances allocated under the scheme is as consistent with the costs of achieving abatement inside the sector as outside it (i.e. it is economically efficient). This is consistent with the efficiency principles behind the emissions trading scheme. The main downside is that it is data intensive and subject to a range of assumptions. This makes it more difficult to explain and so possibly less transparent than some other approaches. The results can apparently conflict with the 'fairness' criteria, since more abatement will be targeted at those sectors that can abate more cheaply.

Equal cost burden

5.28 The main advantage of the equal cost burden approach is that some operators will perceive it to be 'fair' since the same level of expenditure would be assumed for all sectors within a country. On the other hand, those sectors that had already invested in abatement or those might equally consider the approach 'unfair'. One of the main difficulties of the approach would be deciding the appropriate level of cost to share amongst installations and then the level of abatement that each might be expected to achieve for that sum of money. This makes it a relatively complicated approach to explain and so it would lack in transparency. In addition, the approach does not meet the efficiency criterion since the relative costs of abatement are not equalised.

Distance to target

5.29 The main advantage of this approach is that it can be expressed in simple terms, particularly if linked to historic emissions (for instance a 5% cut on 2004 emissions). It is therefore transparent. It can also be changed over time to reflect a tighter cap by changing the percentage reduction. The first consideration is the best way to determine the appropriate level of target, then how to justify and explain it. Whether or not the level of the cap that results is environmentally effective will depend on the target chosen (e.g. whether it is an international or national commitment). If the marginal costs of abatement are taken into account

explicitly in the derivation of the target then it could meet the economic efficiency criterion. It will meet the fairness criterion if the relative burden placed on different groups of installations is considered in setting the target.

Proportional contribution

5.30 The simplicity of this approach is its key advantage. The fact that it can also be linked to a target (and so be made consistent with (inter)national commitments) is another point that would aid transparency. If the approach is to be considered fair, however, it would be necessary to explain why the proportion of the total emissions was appropriate, and also how and why the target was derived (see paragraph 5.29). In addition, to be economically efficient, the proportion would need to take into account the relative costs of abatement.

Bargaining approach

5.31 The main attraction of this approach is that it can leave all stakeholders involved in the bargaining process with a perception that the resulting number is 'fair'. For this to be the case, however, the process by which agreement is reached would need to be transparently presented and the interests of all relevant stakeholders considered. In addition, it is possible that all parties will walk away feeling the result in 'unfair'. It is very unlikely that the outcome will be either transparent or economically efficient. It is also quite possible that the final level will not be environmentally effective, although this will depend on the positions and relative strength of the different bargainers.

Top down versus bottom up

5.32 One question remains, whichever of the approaches set out above is used: whether to build up the cap level from installation-level data (bottom up) or to set it at a high level first and share it out later (top down). Phase I showed that either approach was considered to meet the Directive criteria, since NAPs using both approaches were approved.

5.33 The main advantage of the top down approach is that it allows the total number of allowances to be fixed based on the kinds of approaches we have described. One of the disadvantages is that, if it is based on projections, it is possible that the total number of allowances can change every time the projections are adjusted. One advantage of a bottom up approach is that it enables the total number of allowances to be tailored to the installations covered by the EU ETS. It can be more data-intensive though and, once the information is aggregated, can also result in a total number of allowances that does not appear to directly relate to the high level principles for the cap.

Preferred approach to set Phase II caps

5.34 Table 15 shows that although each approach can meet all of our criteria, whether it does so will depend to a great extent on the detailed information used and the way that the process is conducted.

5.35 WWF has asked us which cap methodology we would recommend based on the evaluation of environmental effectiveness above and lessons learned from Phase 1. In our view, the distance to target approach is the most attractive in that it facilitates:

- like-for-like comparison of caps from one period to another – i.e. it is transparent;
- comparison with international emissions targets – i.e. it enables an evaluation of whether the cap level is environmentally effective;
- consistency over a number of phases (thus providing stakeholders with a degree of certainty and so ensuring that appropriate and efficient abatement decisions are made); and
- can be calculated from published information – again assisting transparency.

5.36 If the baseline for change is an historic data point (rather than a projection), this can stay fixed over time, which again assists with transparency. As we have highlighted in the lessons learned section of the report, one of the most important things is that it must be possible to evaluate the level of a cap in order to establish whether or not it is environmentally effective.

5.37 If the cap is set based on international commitments (or national commitments if they are more stringent), then this approach can also result in an environmentally effective level of cap that is perceived to be fair. As discussed in the evaluation above, Member States have agreed that the burden sharing agreement distributes abatement in a manner that is fair and so setting a cap on this basis should also meet the fairness criterion.

5.38 We think that if an analysis of the marginal costs of abatement feeds into the level at which the target is set, then the resulting cap can also be economically efficient. However, the only way to ensure that the total number of allowances allocated at an EU level is consistent and economically efficient is to discard national caps in favour of a pan-EU cap. (We discuss harmonisation in Section 7). In our view, it is likely that governments would need to use projections to inform their view of the appropriate reduction on the base year. However, it would be possible to fix the projections used relatively early on to minimise the uncertainty that this caused. Bottom up data could be used to verify the projections.

5.39 We have kept this preferred approach in mind when identifying the best practice approach to cap setting set out in the section below.

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6. BEST PRACTICE FOR CAP SETTING

6.1 We have drawn on the evaluation of NAPs in Phase I to set out the key points that we suggest should be taken into account by Member States when setting caps for Phase II. We have highlighted throughout the document how environmental effectiveness requires caps that are transparent, economically efficient, fair and are set at a level that achieves real emissions reductions. The purpose of this section of the report is to summarise the findings that we have drawn from the analysis described in detail above.

6.2 On this basis, a best practice cap would:

- fix the total number of allowances (cap) early, in line with the Directive timescales as a minimum, in order to provide certainty and assist in the optimisation of investment decisions;
- be based on a clear and transparent methodology, preferably expressed as:
  - a distance to target (in terms of the change on an historic base year); and
  - include an analysis of the marginal costs of abatement to show why it is environmentally efficient;
- present the NAP calculation step-by-step with regard to:
  - the national Kyoto commitment under the burden sharing agreement;
  - the expected level of carbon dioxide emissions from the traded sector to meet this commitment;
  - the expected level of carbon dioxide emissions from the non-traded sector to meet this commitment;
  - the targets and measures in place to meet each of these levels; and
  - comparison of each of these levels against the Kyoto base year and a recent historic year's emissions;
- only use projections to inform cap setting processes that are:
  - independently verified and agreed at the start of the process;
  - based on published and clearly identified input assumptions; and
  - explained clearly;
- show the relationship between the cap, the Kyoto target and any national commitments explicitly;
- be subject to formal consultation and comment:
  - early enough in the decision making process for views to be taken into account;
  - supported by informal discussions with all stakeholders;
  - the timetable for consultation should be published and kept up-to-date; and
- provide an indication of future cap levels in future phases (to provide operators with greater certainty).

6.3 Where a liquid carbon market exists, abatement will be undertaken wherever it can be achieved at least cost, regardless of which installations the initial allocation is made to. In such a market it is therefore the level at which the cap is set (rather than who they are allocated to) that is the key determinant of environmental effectiveness. However, as soon as there is a lack of liquidity and it becomes less likely that the market will work efficiently, it becomes more important that the initial allocation of allowances is determined on an efficient basis if abatement is to be achieved at least cost.

Use of Projections

6.4 Projections were widely used by member states to set caps for Phase I[29]. We consider that projections are an important part of any allocation methodology; both to:

- show how a cap compares to (national and international) emissions targets; and
- show how a cap level compares with need.

A best practice approach would thus use projections to inform the level of cap. However we consider that once the cap level has been determined in this way, it is preferable to define it either as an absolute amount (i.e. xMtCO2) or as a change on a historic base year (e.g. x% reduction on 1990 levels), i.e. a distance to target.

[29] Member states took into account both expected economic growth and future emission levels by using projections.

7. KEY AREAS FOR IMPROVEMENT

7.1 In Section 4 we evaluated each of the Phase I caps (summarised in Table 13). We note here three key areas for improvement in each country in order to improve the environmental effectiveness of the caps in Phase II.

Germany

- Level and distance below BAU – could Germany do more?
- Fairness of allocation between sectors – the allocation to the power sector in Phase I appears relatively generous.
- Transparency of documentation – the explanation of the assumptions used to build up the cap could be clearer.

Italy

- Cap level – the Phase I cap level does not appear to be in line with the Kyoto target.
- Economic efficiency – the relative costs of abatement should be considered to determine the abatement required from the package of abatement measures that forms Italy's climate change programme.
- Transparency of documentation – the level of detail in the Italian NAP could be improved to allow a more complete understanding of the cap calculation.

Netherlands

- The Netherlands places a relatively small proportion of the abatement burden on the traded sector due to its reliance on project credits.
- The relationship between the burden placed on the traded sector and meeting the Kyoto commitment should be confirmed.
- The NAP should clearly set out the assumptions made to determine the total cap amount.

Poland

- The traded sector should be required to deliver real emissions reductions.
- The process to set the cap should be aligned with the allocation methodology at an installation-level.
- All stakeholders should be given equal access to all information.

Spain

- The Spanish cap is not in line with the Kyoto target given historic trends in emission.
- The NAP should make clear the assumptions made regarding the relative costs of abatement in the traded and non-traded sectors.

- The consultation process with stakeholders could be improved to ensure that all interested parties are given equal opportunity to influence the process.

United Kingdom

- Set any projections before the cap-setting process begins.
- Use a cap-setting process that requires a fixed proportionate reduction on a historic base year, in line with stated national and international commitments.
- Set the final cap within the timescales prescribed by the Directive.

8. HARMONISATION ISSUES FOR CAPS IN PHASE II

8.1 Our evaluation of the Phase I caps has highlighted how different Member States set their caps in a wide range of ways. This has made it difficult to be sure that we are comparing like with like and to understand the detailed assumptions behind the final caps. There is therefore significant scope for both the cap setting methodologies and the documentation explaining them to be harmonised in Phase II.

8.2 In order to improve the environmental effectiveness of the scheme, harmonisation would need to affect:

- the level of each cap (as set out in paragraph 3.15);
- the way that it is calculated, to take into account:
  - economic efficiency, i.e. the costs of abatement inside and outside the scheme (see paragraph 3.16);
  - fairness, the way that abatement is distributed between different countries and installations (see paragraph 3.17); and
- the way that the cap calculation is explained and presented, to improve transparency (see paragraph 3.20).

8.3 In this context then, harmonisation means aligning the level of national caps by ensuring that the ways that they are calculated and presented are similar. We list the key areas where harmonisation could be used to improve environmental effectiveness below.

Level of caps

8.4 As we have identified above, in our view, one of the key determinants of environmental effectiveness is the total number of allowances issued under the scheme. So long as there is a liquid trading market, the total number of allowances will determine the resulting level of emissions more than which country or installations they are allocated to. As a result, this is a key area where the scheme could benefit from increased harmonisation. The different options are set out below. We identify which of these options we consider would be feasible for Phase II.

Pan-EU cap setting

8.5 If an EU-wide cap were to be set then it would be possible to ensure that the total number of allowances allocated contributed real emissions reductions, very directly, beyond those that would have happened anyway.[30] As discussed above,

[30] For instance, one of the principles to set an EU cap would be that it was a fixed amount below an agreed projection of emissions.

this is essential to ensure the environmental effectiveness of the scheme. It is unlikely, however, that such an approach will be possible for Phase II given that the Directive currently allows Member States to determine the number of allowances to be allocated at a national level and we do not expect that the Directive will be revised for Phase II. (We discuss pan-EU cap setting further in Section 7). In that event EU wide emissions will be capped at the level dictated by the aggregation of the individual Member State caps – with no guarantee of a reduction against BAU for the EU as a whole.

Harmonisation of projections

8.6 Projections were used in Phase I, both to evaluate cap levels (e.g. to confirm consistency with the Directive criteria) and also to calculate the number of allowances to allocate. A range of input assumptions and modelling approaches were used. The result was that it is difficult to compare the approaches and also to ensure that they are consistent (and so to ensure also that the levels of cap require emissions reductions beyond those that would have happened anyway, i.e. are environmentally effective).

8.7 For Phase II, we consider that it would be possible to develop and publish a single set of projections, of both emissions from installations covered by the EU ETS and also from sectors and gases outside the scheme that affect the EU Kyoto target. These projections could be used to[31]:

- Indicate the level below which each national cap would need to be to imply real emissions reductions against those projections, so facilitating the evaluation of each NAP.
- Analyse the contribution that other sectors and gases are expected to make towards the Kyoto target, and so the total number of allowances that would put the EU in line with its Kyoto target.

8.8 Member States' Phase II cap levels could then be compared against these projections to ensure that they are at an environmentally effective level. Since each Member State's NAP is already evaluated (by the Commission), this type of harmonisation is much more closely in line with the rules already in place than the kind of EU-wide cap setting described in paragraph 8.5.

8.9 The extent to which such harmonisation is feasible for Phase II depends on the extent to which such work has already been undertaken and the extent to which the assumptions on which it is based can be put into the public domain.

Harmonised use of historic data

8.10 In the time available for Phase II then, it might be more straightforward to ensure comparable evaluation of Phase II caps against historic emissions information.

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[31] For comment on the use of projections see paragraph 6.4.

8.11 Although differences in opinion will exist about the most appropriate sources of data to use, it might be possible to ensure that, say, where Kyoto targets require a reduction in emissions, the cap is on a downward trend compared with recent emissions. Or, for instance, that if the traded sector has emitted a proportion of a country's emissions in the past, the cap reflects a similar proportion of expected national emissions for the future.

8.12 This could form part of the Commission's evaluation of the NAPs. Although such evaluations might not ensure that the caps meet the criteria for economic efficiency and fairness that we have established for our analysis, they could enhance transparency, which is another requirement for environmental effectiveness. Since historic data are already available, we consider that such comparisons should be feasible for Phase II.

Incorporation of international targets

8.13 The Directive requires that cap levels be in line with targets for emissions reductions. Since Phase II of the scheme corresponds to the first Kyoto commitment period, it will be important to ensure that the caps are in line with these targets to ensure the environmental effectiveness of the scheme. As we have discussed above, one of the fundamental principles of the Kyoto Protocol is that there is a degree of flexibility in the way that Member States can meet these targets. It would not therefore be appropriate to suggest that all Member States incorporate the targets in the same way.

8.14 It would however be possible to ensure, perhaps as part of the Commission's evaluation of the NAPs, that the way in which these targets have been incorporated and the implied burden on the non-traded sector are evaluated and approved in a consistent way.

Incorporation of national targets

8.15 Where Member States have set a national target unilaterally it will be more difficult to ensure that these targets are incorporated in a harmonised way, especially since the incorporation of such a target will only improve the environmental effectiveness of the scheme if it is more strict than the international targets mentioned above.

8.16 It should however be possible to ensure that where such targets do exist and are applicable for the traded sector, the way that they have been incorporated into the cap is evaluated in a consistent way.

Economic efficiency

8.17 We have discussed above how it is important to balance the costs of abatement inside and outside the traded sector if the scheme is to deliver emissions abatement at least cost. One of the lessons we have learned from Phase I is that

Member States have often not explained how these costs have been considered and the assumptions used to compare costs are not always clear.

8.18 One of the factors that should be considered in assessing the abatement potential at any price should be the likelihood of that abatement taking place (we have mentioned above how, for instance, it is easier to affect the energy use of industrial customers compared to, say, households).

8.19 For harmonisation to improve the environmental effectiveness of the scheme, all Member States should move towards a cap-setting methodology that takes into account these relative costs explicitly. We set out the different ways that economic efficiency could be incorporated (given sufficient time and resources) below.

Efficiency at an EU level

8.20 On a theoretical basis the optimal option is one where the relative costs of abatement would be balanced at an EU-wide level, by comparing the costs of abatement in the traded and non-traded sector of each country. Each Member State's cap could then be set on this basis (possibly taking into account some adjustment for fairness, discussed below).

8.21 However, such an approach would require extensive international cooperation; the optimal outcome would only be achieved if each Member State agreed to set its cap on the same principles. For Phase II then, it might be possible to use a single published analysis of the relative costs of abatement to evaluate each national cap. However, it would be necessary to collate and make consistent data from each Member State and possibly from a range of information sources within each country.

Efficiency at a national level

8.22 It would also be possible to ensure that Member States move towards an approach which sets out explicitly the way that the relative costs of abatement have been analysed and incorporated into both the cap and wider national climate change strategies. For instance, part of the Commission approval process could be to ensure that each Member State provides the same information to the same level of detail on the way that the contribution of the non-traded sector has been incorporated.

Fairness

8.23 Given the difficulties in defining fairness and the different perspectives of each Member State and each stakeholder, harmonisation is only likely to deliver a more 'fair' outcome if the total cap is determined at an EU level and the effort then distributed on a transparent and robust basis. Even then, whether the cap is 'fair' will depend on the approach to distribution taken and the bargaining power of all the parties involved.

8.24 Fairness can impact on the environmental effectiveness of the scheme in a number of ways. For Phase II, if decision makers do not consider the Phase I allocation fair, they will be more likely to try and increase their own country's allocation in order to improve their national position. In addition, if Member States do not consider cap levels to be fair, they will be less likely to support the scheme beyond Phase II. We explore how harmonisation could impact on the perceived fairness of the scheme below.

Fairness between countries and sectors

8.25 For Phase II, the following steps towards harmonisation could help to make the NAPs more environmentally effective.

- The use of the projections described above to show the level of effort a cap level implies beyond an agreed business as usual level, both at a national and sector level.
- The use of the projections above to show at what level a national cap should be to be considered 'in line with Kyoto', given each Member State's contribution under the burden sharing agreement (which, as we have discussed, is a commitment that has been agreed to be 'fair').
- Comparison with historical emission levels could provide important additional information for the assessment of caps and could build a second pillar for an integrated assessment.

8.26 If consistent projections are established, then the aggregate compliance costs for sectors and Member States calculated on the basis of harmonized projections and abatement costs could serve as an appropriate indicator for fairness. However, as discussed above, some parties might not consider this approach to be 'fair'.

Transparency

8.27 Harmonisation of the way that the cap calculation methodology is explained and presented could facilitate comparison of the caps between countries and also the evaluation of their level.

8.28 We consider that the NAPs would be more straightforward to understand and evaluate if:

- the cap level was described in the same way in each country (for instance, an X% reduction on a uniform historic base year[32]);

[32] Experience from Phase I and various climate change negotiations has shown it would be naïve to imply that it such a formulation could be determined without debate. Some discussion will be inevitable to fix the number of allowances to allocate, however the final cap level is described. Our point here is that describing the cap level in a simple, fixed way sets a useful precedent for future phases and minimises room for misunderstanding.

- an analysis of relative abatement costs and the methodology used to take them into account was provided;
- a transparent description of any projections (including key data, assumptions methodologies and sensitivities) is provided if projections are used to inform the cap setting process;[33]
- the reporting format to set out the assumptions and analysis behind the cap level (covering areas such as those described above) was standardised;
- a common set of indicators is developed at an EU level, reported by each Member States, covering the areas described above;
- timetables for the stakeholder consultation process were published and regularly updated for each Member State; and
- each Member State published all relevant documentation on a single national website.

8.29 For instance, it might be possible for the Commission to set out guidance that required the NAP submitted to include the points listed above in documentation submitted as part of the approval process, and that that information be made public.

[33] For comment on the use of projections see paragraph 6.4

9. BEYOND 2012: EU CAP OPTIONS

Introduction

9.1 In this section we discuss the issues and challenges facing decision makers beyond 2012. In this context, we summarise the range of approaches that could be used to set cap levels beyond Phase II in order to ensure environmental effectiveness. We also make some recommendations for the ways that caps for the EU ETS could be set in the long-term.

Relevant issues and challenges

9.2 In the text below, we set out the headline issues and challenges facing decision makers beyond Phase II. These issues influence the range of options available to set caps in later phases and therefore their likely levels, the scope for economic efficiency, the ways that fairness might be incorporated and the extent to which transparency in decision making will be possible.

Beyond the Directive

9.3 The Emissions Trading Directive sets out some guidelines for future phases of the scheme. For instance, it establishes that phases will be five years in length and that the timetable for the delivery of NAPs and the surrender of allowances will roll forward. However some conditions, such as the limits on auctioning, are only set as far out as Phase II. As a result, the fundamental rules, on which all decisions for the Scheme are based, will be amended after Phase II.

Next Kyoto commitment period

9.4 The first Kyoto commitment period corresponds to Phase II of the Scheme and Member States have agreed and committed to emissions reductions to achieve in this timeframe. No such commitment has yet been made beyond Phase II. Two key questions remain that will affect decisions regarding EU ETS caps in particular.

- The likely nature of future commitments: i.e. the way that caps will be coordinated with wider Kyoto commitments. For instance, whether or not a cap for the traded sector will form an explicit part of any future burden sharing agreement.
- The likely nature of EU commitments: both in terms of the level of abatement that will be required from the EU and also the way that this will be shared across individual Member States.

Future burden sharing agreements

9.5 The burden sharing agreement, which splits the wider EU target amongst the individual Member States also only covers Phase II. It is possible that a similar agreement will be reached for future Kyoto commitment periods. However, it is

also possible that the abatement requirements may be spread out in a different way. The approach taken to burden sharing will determine the abatement required from a Member State, which will influence any decisions on cap levels.

Extended time frame

9.6 Although the business plans of commercial organisations already stretch beyond Phase II, 2012 is a relatively long way off for decision makers and Governments currently trying to determine caps for Phase II. Experience has shown how there can be political reluctance to make medium-term commitments on climate change, particularly before it is clear what impact existing policies and measures will have had by the time those commitments come into force.

Need for long-term certainty

9.7 Although the wide range of influences that impact on emissions means that some degree of uncertainty is inevitable in any carbon market, long-term certainty is important if operators are to make investment decisions that are optimal from an environmental perspective. Decision makers can assist by setting medium- and long-run goals for schemes such as the EU ETS, in order to help participants plan for the future.

Interaction with other schemes and mechanisms

9.8 It has yet to be seen how successfully the project mechanisms will be integrated with the EU ETS in Phases I and II. In the longer term, it will become feasible, if not essential, to integrate the scheme with other initiatives to reduce emissions on a global scale. The impact of such integration on cap setting will depend on the initiatives to which the EU ETS is linked and the sectors and gases that they cover.

How much national – how much European – how much global

9.9 One of the key questions in considering caps in the long term is the extent to which abatement of greenhouse gases will be determined at a national, EU or global level. By its very nature, global warming needs to be tackled in a cohesive way. In the context of the Kyoto Protocol, it is likely that international agreements to constrain emissions will continue to form the framework for abatement.

9.10 The scope of any international agreements will be determined to a large extent by the political views of the key governments. This will affect whether or not a global cap and trade scheme will be introduced. With the EU, and countries like Japan, Canada and some US states setting up emissions trading schemes, there is arguably a political impetus to establish an international trading scheme. Although it might be argued that the involvement of some of the non-Annex I countries could help to support such a critical mass.

9.11 Whether and how international targets are cascaded down to individual countries will depend to some extent on the infrastructures already in place to accommodate targets. The EU ETS will form a useful platform to build on. Not only has it established the rules for international emissions trading, it has also familiarised a

large number of operators with the challenges and opportunities that such a scheme presents.

9.12 Looking at the balance of commitments between national governments and the EU then, this will depend on a number of far reaching questions, including:

- the nature and membership of the EU in the future; and
- the balance of power between national Governments and the Commission.

EU wide commitments could negate the need for national decisions on caps. Equally the principles that underpin the EU point to the continued national involvement in the detailed implementation of any future trading schemes.

Future approaches to the EU ETS – key questions and guiding principles

Future (long term) cap

Length of Phase

9.13 The first question when considering cap levels is the number of years that any cap will cover. The Directive currently establishes that all future Phases will be five years in length. From an environmental effectiveness perspective, a key advantage of five-year phases is that the cap is updated relatively regularly which will ensure that it does not become out of line if emissions trends are other than expected. One of the disadvantages is that it does not provide the long-term certainty required for operators to invest in the optimal way.

9.14 Alternatives would either be to have shorter phases (such as the three years used for Phase I). Although this provided more flexibility to ensure that the total number of allowances is likely to achieve real emissions reductions beyond those that would have happened anyway, the regular changing of the number of allowances allocated would not assist operator certainty or transparency.

9.15 The other approach then is to dispense with the principle of Phases and set caps according to predetermined path, in which the number of allowances changes consistently from year-to-year (e.g. an X% reduction on the previous year). The main advantage of this approach is the long-term signals that it provides for investors. However, the allocation methodology for individual installations would also need to be fixed if it is really to provide long-term certainty. Another disadvantage is that it would not be possible to factor in economic efficiency to this approach except for when caps are set initially, or take account of unforeseen changes in circumstances (such as movements in fuel price relativities).

EU-wide commitment or national caps?

9.16 In the longer-term, it would be possible for an EU wide cap for the EU ETS to be set, rather than individual country caps. The main advantage of this approach would be that the total number of allowances issued, in our view one of the key

determinants of the environmental effectiveness of the scheme, could be set in a considered way that reflected each of our criteria (efficiency, transparency and fairness). Under this approach, even if Member States inflate individual caps to protect international competitiveness, the total number of allowances would remain unchanged.

9.17 A second key advantage is that by committing to a level of emissions from the traded sector, on the assumption that there also continues to be an economy-wide target,[34] an EU level cap would also imply a level of ambition for the non-traded sector. If the level of emissions is set at an EU wide level, this will make it easier to ensure that the emissions reductions sought from these installations reflects their ability and propensity to abate. The information used to strike this balance would of course need to be published if the approach is to be transparent.

Harmonisation

9.18 Whether or not an EU-wide cap is possible will depend on the decision-making process beyond Phase II and also the political momentum behind such an idea. Given the Kyoto target was agreed at an EU level, it should be possible in principle; however it would inevitably take some time.

9.19 It is worth bearing in mind that since the Kyoto Protocol provides for Member States to meet national targets flexibly, it could be argued that it is not appropriate for targets for individual schemes to be assigned. If the scope of the scheme is extended (discussed further below) such arguments would carry less weight.

9.20 A second-best to an EU-wide cap would be for a harmonised approach across all Member States. We have proposed some ideas for harmonisation in Phase II in Section 7. Harmonisation could help to ensure that all countries take into account the same factors when determining cap levels, so that the final level of allowances issued will deliver real emissions reductions beyond those that would have happened anyway.

Full auctioning

9.21 An EU wide cap of the kind above would need to be distributed between installations in one way or another. From an efficiency and environmental effectiveness perspective, our preferred approach to allocation is auctioning. Full auctioning of an EU wide cap in a harmonised way would lead to an efficient distribution of abatement. For full auctioning to work successfully, the rules and mechanisms put in place would need to be equally open to all participants in all Member States (and they would need to be transparent and fair).

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[34] This assumption is based on the fact that the key driver of climate change is the total GHG emissions (i.e. from all sectors) and therefore targets are likely to be set on an economy wide basis.

9.22 Another advantage of full auctioning is that it would reduce the need for market intervention of the kinds proposed for Phase I. The possibility of windfall taxes[35] distorts the incentives of the scheme, and also introduces further regulatory uncertainty[36].

Burden sharing

9.23 Many of the arguments in favour of grandfathering (e.g. that it compensates stranded assets and eases the transition to assigning a value to emissions) are eroded once the scheme has been up and running for a number of phases. For instance, installations have had warning that the costs of carbon should be incorporated in investment decisions. However, full auctioning might not be possible for political reasons. Decision makers might continue to feel it necessary to reduce the costs incurred by industry by allocating at least a proportion of allowances for free.

9.24 Under these circumstances, it will be necessary to continue to determine who these allowances are grandfathered to. National concerns regarding competitiveness and the differential makeup of the traded sector in each country will strengthen arguments in favour of allowing national governments to perform the allocation.

9.25 The most likely way for the burden to be shared between Member States is through a bargaining approach, since this allows each country to promote national interests in a world where each is competing for a share of a finite number of allowances. In theory, so long as the market is liquid, the way that the total number of allowances is allocated between states (and between installations, for that matter) should not affect the level of emissions or the costs at which they are achieved.[37] Thus, the key is that this initial total number, for the EU as a whole, is set taking all of the criteria for environmental effectiveness discussed in this report into account.

9.26 Any burden sharing agreement could be separated out between the contribution of the traded and non-traded sectors. The main advantages of such an approach are the certainty and transparency that it could provide. The main disadvantage is that

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35 To recoup revenues from free allowances in those sectors where the cost of carbon will be passed through to prices.

36 For further discussion of issues surrounding auctioning, refer to a separate report 'The environmental effectiveness and economic efficiency of the European Union Emissions Trading Scheme: Structural aspects of the allocation' authored by the Öko-Institut.

37 However we have seen in Phase I that, in practice, the allocation methodology can impact on investment decisions. For further analysis of how and why this is the case, refer to a separate report 'The environmental effectiveness and economic efficiency of the European Union Emissions Trading Scheme: Structural aspects of the allocation' authored by the Öko-Institut.

it reduces the flexibility for Member States to meet the total emissions level, and so could compromise efficiency.[38]

Inclusion of other sectors and gases

9.27 Member States may choose to unilaterally expand the scope of the scheme in Phase II to include other installations that emit carbon dioxide, process emissions from other sectors and other gases (over and above those in Phase I). In the longer-term, it would be possible to expand the scheme in all these directions, so long as a single fungible currency[39] could be developed (this would require standardised monitoring and reporting protocols that are internationally recognised and consistently enforced).

Advantages

9.28 We list the key advantages to such inclusions to the scheme from an environmental effectiveness perspective below.

- Increased liquidity: the wider the coverage of the scheme, the greater the number of operators involved and the emissions to be traded. As we have noted above, a liquid market is essential if a trading scheme is to deliver abatement at least cost, so this is a key point for environmental effectiveness.
- Possible erosion of some competitiveness impacts: one of the concerns raised in the pilot phase of the scheme is that by capturing only a subset of installations and allowing the definition of an installation to vary between Member States, not all similar emissions sources are captured under the scheme. Extending it to cover more installations could therefore reduce any such competitiveness impacts. This could improve the fairness of the scheme.
- Reduced monitoring costs for some kinds of installations: by including a subset of gases and sources, some installations have needed to disaggregate data for monitoring and reporting purposes, for instance introducing sub-metering. This imposes additional costs on participants (so impacts on efficiency) and may also make it more difficult to monitor and report emission effectively (affecting transparency).
- Reduced room for differences between countries: it is possible that expansion could reduce the potential for differences in definitions between countries, by capturing a wider range of emissions sources and so reducing the leeway for individual Member States to exclude installations from the scheme.

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38 Allowing the market to define the appropriate level of abatement from the traded and non traded sectors results in a more efficient distribution than administratively set levels. If the balance of abatement between the traded and non-traded sectors is defined at the outset, in the burden-sharing agreement, it is not then possible to adjust this balance in the light of changing circumstances (such as movements in relative fuel prices).

39 Such as tonnes of CO2 equivalent.

Disadvantages

9.29 There are, on the other hand, some disadvantages to this scheme expansion.

- There are more emissions to monitor and report: thus increasing the complexity,[40] and so possibly reducing the transparency, of the scheme.
- High costs of implementation for some sectors: it will be more costly to expand the scheme to some sectors than those incorporated under the Directive as it stands at the moment. For instance, extending the scheme to mobile sources (particularly any that move internationally – transport and aviation, for instance) would require considerable adjustment to the rules. It might be more transparent and less costly to link a separate scheme for emissions from such sources to the EU ETS rather than trying to incorporate them within in it.
- Complexity of allocation distribution: if grandfathering continues to be the preferred method of allowance allocation, expansion of the scheme will make this process considerably more complex.
- Compliance costs may outweigh the benefits of abatement potential for some emitters, particularly those sectors where inclusion would be especially costly, such as transport and aviation.

9.30 From a cap perspective then, the more kinds of emissions captured in the scheme, the greater the number of issues that need to be considered when setting a cap. For instance, in order to establish need, projections for an expanded scheme would need to look at a range of gases, not just carbon dioxide[41].

Principles for expansion in an environmentally effective way

9.31 WWF has asked what kinds of expansion would most impact on the environmental effectiveness of the scheme (focussing on cap setting here). We do not have a view on particular sectors. Instead, we consider that to meet this aim, any expansion should be based on the following principles.

- Significant emitters of greenhouse gases: inclusion of larger emitters[42] will mean that the liquidity and so efficiency of the scheme is enhanced at least implementation cost.

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40 In an extreme case, the increased complexity could cause the operation of the scheme to become unmanageable.

41 Although it is worth noting that these sorts of considerations are already taken into account in the context of national climate change policy, so it is not necessarily that new work would be required, but that the context for it would change.

42 For instance, the UK has consulted on whether the scheme should be expanded to the following sectors: gypsum, glass, foundries and other ferrous metals, petrochemicals, rock wool, integrated steelworks and offshore flaring.

- Sectors where emissions can be clearly defined, monitored and reported: both to ensure that the scheme remains transparent and also to maintain the environmental integrity of the scheme.
- Sectors where the costs of expansion do not outweigh the abatement benefit that can be achieved from them: we do not consider that expansion of the scheme to small emitters with high abatement costs would be 'fair'.
- Expansion is harmonised: to ensure that the coverage of the scheme is 'fair' across member states and also to make any analysis of the emissions and abatement potentials of participants as straightforward as possible.

Interaction between EU ETS and future EU burden sharing agreements

9.32 One of the areas that we have touched on above is the fact that the way that caps are set in future phases of the scheme will affect the way that Member States meet national abatement targets. Some of the issues around this interaction, which are of particular concern from an environmental effectiveness perspective, are highlighted below.

Efficiency considerations (marginal costs)

9.33 One element for achieving environmental effectiveness is that emissions reductions are achieved in an efficient way. One way to enhance efficiency in a liquid market is to provide operators with as much flexibility as possible. Setting sub-targets for particular policies and measures[43] within a particular overall target can curb this flexibility, but this impact must be balanced against the increased transparency and certainty that it provides.

Fairness considerations

9.34 Another important issue is fairness. Agreeing the burden to be carried by different installations can influence stakeholders' perception that the approach is fair, particularly if it is structured to take into account issues such as the relative costs of abatement.

9.35 We have mentioned how equalising the cost burden to be carried by sectors and Member States is perceived as fair by some. Such an approach is only possible through international cooperation and a coordinated attempt to spread the abatement required.

Transparency considerations

9.36 Setting explicit targets for different policies and measures can provide clarity and therefore aid transparency. At the same time, since international agreements are more likely to be the result of a bargaining approach than national agreements,

[43] i.e. in theory it would be more economically efficient to allow the market to decide where abatement should occur rather than divide up the abatement effort administratively.

transparency may be better served by allowing individual Member States to set and explain the reasons behind caps themselves.

Politics and bargaining

9.37 Given the number of interest groups involved and the international nature of the challenge, political concerns will continue to be a feature of cap setting beyond Phase II. There are likely to be a range of views around whether it is appropriate to set EU ETS caps as part of wider climate change agreements or not. It is most likely that the final approach will be the outcome of bargaining by all the groups involved.

Auctioning or not

9.38 We have highlighted above how, from an efficiency perspective, full auctioning should be implemented as soon as possible. However, as we have mentioned above, there may be some political concerns that limit the speed with which this can be adopted.

9.39 From a practical perspective, auctioning could be introduced incrementally:

- Through requiring partial auctioning at a national level, by stipulating the way that the levels set out for the early phases of the scheme should be applied.
- By auctioning allowances to particular sectors, perhaps focussing on those that are best placed to pass on the costs of carbon to prices (the power sector has been identified as one such sector in some countries in Phase I).

However, since neither of these choices need affect the total number of allowances allocated, we do not focus on them here. Equally, questions of how often auctioning should take place and how the revenue thus raised might be used are structural rather than cap-setting issues.[44]

9.40 One of the advantages of auctioning would be that it could reduce the need for national allocation plans and therefore the whole approval process that accompanies them. For instance, if an EU wide cap sets the total number of allowances to distribute, then the concept of 'allocations' disappears since none of the allowances would be handed out for free. Instead, each operator would decide the number of allowances it should buy to cover emissions from its installation.

9.41 The most efficient approach would be for a single independent body to be responsible for auctioning all allowances, since this would minimise the costs to set up the necessary systems and would help to ensure that the process is transparent and open to all parties on the same basis. It would also help to ensure that allowances are

[44] For further discussion of these issues, refer to a separate report 'The environmental effectiveness and economic efficiency of the European Union Emissions Trading Scheme: Structural aspects of the allocation' authored by the Öko-Institut.

released onto the market in a co-ordinated and pre-defined way, to ensure that the availability of allowances does not adversely affect market signals.

9.42 If auction is implemented incrementally (by focussing on particular sectors, countries or both), then the quantities for auction should be determined on the basis of economic efficiency (as we have recommended should be the approach for cap setting under a regime with free allocations).

Alternatives to auctioning that ensure environmental effectiveness & efficiency

9.43 We have highlighted above that our preferred approach to the distribution of allowances would be auctioning. There are a range of approaches that would help to ensure that any resulting distribution is environmentally effective:

- As we have discussed throughout this report, our preferred approach to cap setting would take into account the marginal costs of abatement in different sectors. This should be incorporated to share out any burden beyond Phase II.
- This cap should be expressed as a distance to target.
- In terms of fairness, any sharing of a burden should consider efforts already made in different countries and also the differences in costs and potential for abatement in the Phase for which the cap is being set.
- The shared burdens should be expressed in a clear and transparent way. The burden sharing approach used for Phase II is relatively simple to understand, although the use of bargaining means that it is not possible to see exactly how cost and efficiency concerns have influenced the final outcome.
- Transparency in decision-making is key if the caps are to be environmentally effective in the absence of auctioning. As we have found for Phase I, it is difficult to evaluate the efficiency of caps unless they are presented in a clear and transparent way. Such clarity is relatively straightforward and cheap to achieve, but can have a significant impact on credibility and the long-term success of the scheme.
- Each cap level must be consistent with existing international and national commitments.

Lessons that should be drawn from the long-term considerations for Phase II

9.44 Given the longer time frame, there is much greater scope for changes to the cap setting approach used in the EU ETS in the longer term than for Phase II. However, there are a number of lessons that we can draw from the issues set out above to inform the Phase II caps.

- There is a need for certainty to promote investment that delivers emissions reductions: this could be enhanced by indicating how the level of caps and the way that they will be described will be approached in the long-term.
- The discussion above highlights that there is considerable uncertainty beyond Phase II: one way to reduce the perception of regulatory risk and so to promote environmentally efficient behaviour is to provide early warning.

- Long-term statements and early warning will only be possible if there is political backing behind them. The discussion above highlights just how many decision makers will be involved in the deciding the future of the scheme. International, regional and national issues will all be reflected in future cap discussions.
- Harmonised NAPs could provide a sound starting point for the future: Phase II could set a precedent for future Phases of the scheme. In addition, a successful scheme that has set up an infrastructure for emissions trading could form a platform for a wider scheme post 2012.
- Burden sharing and national, sector or installation-level allocations should not be conducted in isolation: it is essential that the interaction between each of these be considered if the total number of allowances allocated is to be at an effective level.

Beyond 2012: cap recommendations

9.45 Given our analysis of the Phase I NAPs, the key issues that we consider important to set environmentally effective caps beyond 2012 are set out below. These are points that could be borne in mind by all decision makers when determining policies for the period beyond Phase II.

- Decisions should be made as early as possible not just on the cap level, but also on the principles for the long-term operation of the scheme in order to provide operators with a degree of certainty.
- The total number of allowances and role of project credits should be set at as aggregate a level as possible (i.e. an EU level).
- Harmonisation of approach at any level would help keep things simple, reducing the range of methodologies that interested parties need to understand and facilitating the like-for-like comparison of each aspect.
- Steps should be taken to ensure that a liquid market develops – this objective could be facilitated through expansion of the scheme.
- The length of each Phase should be fixed. Keeping at the same length as Phase II (5 years) would help ensure consistency.
- Projections will inform the debate but a single, published set should be used by everybody.
- Given the uncertainties surrounding projections, targets and commitments should also be described against a historical base.
- Rules and decisions should be explained in as transparent a way as possible.

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10. SUMMARY, RECOMMENDATIONS AND OUTLOOK

Summary

10.1 In summary, Phase I has provided an opportunity for Member States to develop cap levels that determine emissions levels over three years. As future phases of the scheme cover five years, it will be increasingly important that our four criteria for environmental effectiveness are considered when setting caps. To reiterate, the criteria that we have identified to ensure environmental effectiveness are:

- level of cap: beyond business as usual, and in line with Kyoto and in line with Kyoto and national targets;
- economic efficiency;
- fairness; and
- transparency.

10.2 Member states have used a variety of methodologies to develop caps for Phase I that have been presented in a wide range of ways. None of the Phase I NAPs analysed in this report met all criteria, and opportunities exist for improvement in the next phase.

Recommendations

10.3 We have summarised the key areas for improvement in each of the NAPs in Section 7 of this report. In particular, we consider that there are areas where increased harmonisation could improve the environmental effectiveness of the scheme. For instance, ensuring that all Member States provide a sufficient amount of information to the level of detail necessary to understand the cap calculation would greatly improve the transparency of the caps.

10.4 Our preferred approach to cap setting is to take into account the marginal cost of abatement and to express the cap as a distance to target.

Outlook

10.5 Looking forward, significant challenges exist to ensure that the scheme delivers emissions reductions beyond those that would have occurred anyway. There are some key issues that it is worth highlighting:

- Political acceptability: caps must be acceptable both across and within countries to ensure the credibility of the scheme.
- Negotiation process: the setting of EU ETS caps beyond Phase II will form part of the wider climate change negotiations that will define international targets beyond 2012.
- Burden-sharing arrangements: an agreement on the distribution of the abatement burden beyond the first Kyoto commitment is essential.

- In the longer-term, linking (with other schemes beyond Europe) will become not only feasible but essential to ensure that real emissions reductions are made in an efficient way.

ANNEX A – LIST OF ABBREVIATIONS

Abbreviation	
CDM	Clean development mechanism
Commission	The European Commission
Directive	The Emissions Trading Directive
EUA	European Union emissions allowance under the EU ETS
EU ETS	European Union Emissions Trading Scheme
GDP	Gross domestic product
JI	Joint Implementation
MAC	Marginal abatement cost (the incremental cost of reducing emissions by a small amount)
MtCO2	Million tonnes of carbon dioxide
MtCO2e	Million tonnes of carbon dioxide equivalent
NAP	National Allocation Plan
NER	New entrant reserve
NIR	National Inventory Report
Phase I	2005 to 2007
Phase II	2008 to 2012
UK	United Kingdom
UK DTI	United Kingdom Department of Trade and Industry

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ANNEX B – PROFILE OF CONSORTIUM

Avanzi

B.1 *Avanzi – idee, ricerche e progetti per la sostenibilità* is a leading and independent think tank dedicated to sustainable development. Established at the end of 1997, Avanzi carries out applied research and pilot projects with an innovative approach, affecting both the content of decision making and the players involved. The particular nature of Avanzi – a bridge between academia, business and the public sector – also makes the approach quite unique in both an Italian and European context. Avanzi's team, characterised by cross-sector knowledge, is made of researchers with a background that ranges from economics, business administration, planning, law, political sciences and environmental sciences.

B.2 Further information is available from Avanzi's web site (www.avanzi.org) or requested by e-mail (mailto:info@avanzi.org) or Phone + 39-02-36518110 or Fax + 39-02-36518117.

EcoSolutions Consulting (ESC)

B.3 EcoSolutions Consulting (ESC) is an environmental consultancy based in Warsaw, specialised in emissions trading and climate change, advising clients on Kyoto mechanisms and EU ETS.

ILEX

B.4 ILEX is a leading independent European energy markets consultancy specialising in the electricity, gas, carbon and renewables markets. The ILEX team includes economists, policy analysts, regulatory experts and market specialists. Our core strength is our combination of expert knowledge of the markets with first class quantitative analysis. This enables us to offer the highest quality of commercial, economic, strategic and policy advice. ILEX is based in Oxford and helps clients throughout Europe, particularly in the UK, Ireland, Italy, the Netherlands and Spain. ILEX is part of Electrowatt-Ekono the global energy consultancy.

B.5 Further information is available on the ILEX web site (www.ilexenergy.com) or by email (mailto:energyconsult@ilexenergy.com).

ILEX Iberia

B.6 ILEX has an established office in Madrid, Spain. ILEX is uniquely qualified to help participants in the Spanish and Portuguese energy markets. We combine extensive experience in the liberalisation processes with detailed knowledge of the structure and characteristics of the Iberian electricity and gas systems.

B.7 Further information is available on the ILEX web site (www.ilexenergy.com) or by email (mailto:energyconsult@ilexenergy.com).

Öko-Institut

B.8 Öko-Institut (Institute for Applied Ecology, a registered non-profit association) is on of the leading environmental research institutes in the field of applied ecology in Germany. Öko-Institut's researchers elaborate scientific studies and advise politicians, institutions, environmental associations and companies. Established in 1977, the Institute has a wealth of experience in exploring and assessing environmental problems, pinpointing risks and developing solutions.

B.9 Further information is available on the Öko-Institut's web site (www.oeko.de) or by email (mailto:info@oeko.de).

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Quality Control Check Sheet

THE ENVIRONMENTAL EFFECTIVENESS OF THE EU ETS

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