Assessment of the Member States' policies and measures submitted under the EU Monitoring Mechanism in 2011

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Executive summary

This report presents an overview of the information on climate mitigation policies and measures reported in 2011 to the European Commission by EU Member States, under Decision 280/2004/EC concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol ("Monitoring Mechanism" Decision or "MM" Decision) and its implementing provisions (Decision 2005/166/EC).

In 2011, Member States provided information on 1,397 individual policies and measures (PAMs) of which over 79% of PAMs were already implemented or adopted and 20% were still in the planning phase. The highest number of policies affects the energy supply and transport sectors, followed by the industry and residential sectors. The sectors which are not covered by the EU Emission Trading Scheme (ETS) are targeted by more policies than the ETS sector. The number of policies affecting each greenhouse gas is broadly proportional to the percentage each gas accounts for in GHG inventories, with CO_2 emissions being affected by the largest number of PAMs. Based on the information provided, the five year period 2005-2009 has seen the implementation of the highest number of policies in the EU. This is likely to be as a direct effect of phase 2 of the European Climate Change Programme (ECCP II). However, 2004 was the single dominant year for policy implementation, where over 120 PAMs were implemented.

Nearly three quarters of the reported policies were directly related to Common and Coordinated Policies and Measures (CCPM):

- The three most reported CCPMs were the Landfill Directive (1999/31/EC), the RES-E Directive (2001/77/EC) and the EU ETS (2003/87/EC). The most reported PAMs were similar to the CCPMs expected to provide the largest emission savings according to the European Commission.

- A higher proportion of the policies linked to CCPMs affect the energy supply sector and affect the transport and residential sectors less compared to all reported policies.

- The highest number of PAMs implemented solely as a result of national objectives affect the transport sector.

21% of PAMs reported were adopted or implemented between 2009 and 2011:

- A slightly lower proportion of policies introduced in recent years affect the energy use - industry/construction sector and the share of policies which affect the transport sector have increased slightly. The transport sector is key for the EU to meet emission reduction targets in 2020.

- The proportion of policies which use planning instruments is much higher in the recently implemented policies compared to all reported PAMs (20% and 6%). This is as a result of a shift away from the implementation of economic policies (19% and 29%) and information measures (10% and 4%) and the large number of planning policies recently implemented in France.

- Policies which have been implemented or adopted recently tend to affect both the EU ETS and non ETS sectors in comparison to the overall sample of PAMs which has affect one or the other.

- Policies which have been introduced in recent years are often linked to those CCPMs whose objectives align with the objectives set under the Energy and Climate Package (RES Directive (2009/28/EC) and End-use efficiency and energy services directive (2006/32/EC)).

The overall completeness of the mandatory qualitative information on PAMs reported in 2011 was high. The reporting of policies linked to EU wide CCPMs which should already be implemented at Member States varied across Member States from Luxembourg who only reported policies linked to 10% of the CCPMs in the indicative list to Spain who reported 92%.

Quantified emission savings were complete for approximately half of the reported PAMs. The completeness of the emission savings was highest for 2020, where Bulgaria, Cyprus, the Czech Republic, Greece, Ireland, Italy, Malta and the United Kingdom reported quantified emission savings for all PAMs. Romania quantified none of their emission savings for 2020 and Poland only quantified 5%.

The energy supply and the cross-cutting sectors have the largest reported sectoral emission savings in 2010, 2015 and in 2020. The share of emission savings by sector changed slightly between 2010 and 2020. A higher proportion of savings result in the energy supply (36% to 39%), energy use – industry (8.8% to 13%) and the transport sector (9.4% to 14%) in 2020 compared with 2010.

The Member States that reported highest emission savings are those with large emission inventories (Germany, the United Kingdom, Italy and Spain). When the emission savings are calculated as a % of their projected emissions, Sweden, Greece, Bulgaria and Cyprus have the largest emission savings considering their projected emission levels.

In the energy supply sector, large emission savings are expected from Germany, Spain, Greece, the United Kingdom and Italy. In 2010, the policy that delivered the most savings was Spain's promotion of generation from wind energy. By 2020, it is anticipated that Germany's Renewable Energy Act will deliver the largest emission savings. The key CCPMs influencing the sector are the RES-E and the RES Directive. National policies linked to these CCPMs are comparatively well reported, but despite this the total emission savings from these policies is under half of that expected by the European Commission.

The energy use sector is commonly the second most important sector after energy supply. The emission savings which are quantified are influenced heavily by the savings of Germany, the United Kingdom and Italy. Electricity conservation in Germany and the United Kingdom's Renewable Heat Incentive are key policies delivering savings by 2020. This sector has a larger contribution from non-CCPM national policies which contribute more than 50% of the savings in 2010.The influential CCPMs are the end-use and energy services Directive and the energy performance of buildings Directive.

The Quality assurance/quality control (QA/QC) procedure implemented by the EEA and its European Topic Centre on Air Pollution and Climate Change Mitigation (ETC/ACM) identified a number of issues in Member State submissions and allowed the quality and completeness of reporting to be improved in the majority of Member States. The quality of the reported information on PAMs in 2011 for various quality criteria ('TCCCA') is as follows:

Timeliness - Nine Member States provided submissions before the deadline, three Member States resubmitted their 2009 submission however all other Member States provided late submissions .

Transparency - Just 16% of total reported policies included a reference for the source of emission estimates. Sixteen Member States did not report this information at all. However, this element of reporting was not a mandatory part of the submission.

Completeness – The completeness of the mandatory qualitative information was high. Information on the EU policy addressed/ related to the PAM, policy interaction and indicator to monitor the progress of the PAM was the least complete, reported for all PAMs by only 16, six and four Member States respectively. Only six Member States (Cyprus, Czech Republic, Greece, Ireland, Italy and Malta) were able to fully report mandatory quantitative information. The completeness of the emission savings in 2020 was higher than savings in 2010. The completeness of the recommended qualitative information varied across the different information requested. Brief description of the policy was reported for over 80% of reported PAMs but only completed for all PAMs by nine Member States (Belgium, Bulgaria, Denmark, Finland, Hungary, Luxembourg, Latvia, Portugal and the United Kingdom). Whereas, the non-GHG mitigation benefit was reported only for just over 10% of the reported PAMs and no Member States completed the information for all PAMs reported. The completeness of the recommended quantitative information is very low. Ex-post emission reduction estimates were only reported by Romania, Finland, the United Kingdom, Belgium, Austria and France and only for 64 PAMs. Information on cost of emission mitigation is only reported for 28 PAMs (by the United Kingdom, Spain, Czech Republic, Lithuania, Finland, France and Denmark).

Comparability - 19 Member States used the recommended reporting format however, use of notation keys were not consistent across Submissions. Currently, there is no agreed methodology for calculating ex-ante and ex-post emissions savings or the cost of emission mitigation. As a result, the comparability of the quantitative information is low. For the qualitative information, guidelines to be followed by Member States exist to increase comparability of the information. But, these guidelines lack detail. Thus, although comparability of the submission has increased since 2009, many comparability issues remain, further work needs to done to harmonise the information to be reported to improve the comparability.

Consistency - Seven Member States had unresolved inconsistencies within their reported information. Emission savings split by ETS and non ETS were consistent with the total emission savings. One issue was unresolved for a policy reported by Slovakia.

Accuracy - Only Ireland, Italy, Luxembourg and Spain reported emission savings from AM which are similar in magnitude (difference less than 20%) to the difference between the WEM and WAM projections scenarios. For other Member States, the bottom up emission saving estimates is lower than the top down estimate as a result of incompleteness of the reported information of quantified emission savings. Reported emission savings of EM is expected to reduce emissions by more than

20% in the WEM scenario (or emission savings of EM + AM is expected to reduce emissions by more than 25% in the WAM scenario) in eight Member States (Cyprus, Finland, Greece, Hungary, Romania, Slovenia and Sweden). The emission saving estimate for 'EU-Emission trading scheme' reported by Romania has been omitted since the magnitude of the saving is of similar magnitude to the projected emission reported by Romania in 2010. For other Member States, key policies with high emission savings should be used for further analysis with caution.

The robustness of the MM Decision reporting in future years will depend on the quality of submissions. The quality may be improved by providing more focussed guidance for Member States on how to produce the emission-saving estimates and the level of detail which should be provided for the information requested. Also it is important to emphasise the importance of correctly assigning national policies to CCPMs, consistent use of notations and timeliness of submissions

1 Introduction

1.1 Reporting requirements for Policies and Measures

Under the Kyoto Protocol (KP), the EU-15 has a binding target to reduce their greenhouse gas (GHG) emissions by 8% against 1990 levels over the five year period 2008-2012. Parties are encouraged to implement policies and measures which will limit or reduce GHG emissions. The KP, requires all Parties to report on the steps they are taking to mitigate climate change through a "national communication" report which are due periodically. At the EU level, Decision 280/2004/EC implemented the KP ("Monitoring Mechanism" Decision or "MM" Decision concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol and its implementing provisions (Decision 2005/166/EC)). With regards to the reporting requirements for policies and measures, under Article 3 (2) of the MM Decision and Article 9 of its implementing measures Member States have a legal requirement to report the information. The Article states:

Member States shall, for the assessment of projected progress, report to the Commission, by 15 March 2005 and every two years thereafter:

(a) information on national policies and measures which limit and/or reduce greenhouse gas emissions by sources or enhance removals by sinks, presented on a sectoral basis for each greenhouse gas, including:

- *(i) the objective of policies and measures;*
- *(ii) the type of policy instrument;*
- *(iii) the status of implementation of the policy or measure;*
- *(iv) indicators to monitor and evaluate progress with policies and measures over time, including, inter alia, those indicators specified in the implementing provisions adopted pursuant to paragraph 3;*
- *(v) quantitative estimates of the effect of policies and measures on emissions by sources and removals by sinks of greenhouse gases between the base year and subsequent years, including 2005, 2010 and 2015, including their economic impacts to the extent feasible; and*
- *(vi) the extent to which domestic action actually constitutes a significant element of the efforts undertaken at national level as well as the extent to which the use of joint implementation and the clean development mechanism and international emissions trading, pursuant to Articles 6, 12 and 17 of the Kyoto Protocol, is actually supplemental to domestic actions, in accordance with the relevant provisions of the Kyoto Protocol and the Marrakech Accords;*

This report presents a summary of the information on policies and measures that has been reported in 2011 by the Member States under the MM Decision.
In 2007 the European Council committed for the EU to reduce GHG emissions by at least 20% by 2020 compared to 1990 levels. All Member States will contribute to this effort and the Effort Sharing Decision established annual binding GHG emission targets for individual Member States for the period 2013-2020. Thus the reporting of policies and measures which mitigate GHG emissions will continue to play an important role post the Kyoto period to understand the efforts being carried out for the EU to meet its emission reduction targets.

1.2 Objectives of work programme

The objective of the work programme is to compile high quality information on climate mitigation PAMs on the basis of the information reported by the Member States under the MM Decision. This report presents a summary of the reported data by the Member States in 2011 on policies and

measures to provide the reader an understanding of the PAMs in place in Member States. The report is split into two sections:

- Information on the type of policies reported, such as whether the majority of the policies are already implemented, adopted or still in the planning stage and which sector is being affected by policies. The information is analysed for three groups of the reported policies: firstly all reported policies, secondly, those policies linked to Common and Coordinated Policies and Measures (CCPMs) and finally recent policies (recent is defined as those introduced after 2009);

- Quantified emission savings from policies and measures that are expected to deliver the largest emissions savings as reported by Member States in their submissions. The emission savings are compared against the latest emission savings estimated by the European Commission;

An important part of the work programme is the dissemination of the data, which has been compiled, which have been used in this report, to the public. This is available through the Database on Policies and Measures in Europe on the EEA website (http://www.eea.europa.eu/themes/climate/pam/introduction).

1.3 Scope of project

The report covers the geographical area presented by the 32 EEA member countries. However, no information on policies and measures were reported in 2011 by those member countries outside the EU-27. Unless otherwise noted, the acronym EU is used to represent the European Union as constituted of its 27 Member States (EU-27).

Denmark, Germany and Portugal did not submit updated information on policies and measures in 2011. Thus, the data presented in this report is based on their 2009 submission.

1.4 Quality assurance and Quality Control of Member State submissions for the Monitoring Mechanism Decision

To further improve on the completeness, consistency and the accuracy of the data, a review procedure was drawn up by the ETC-ACM in the form of the 'Quality assurance / quality control procedure for the reporting of policies and measures under the MM Decision)' (EEA, 2011a) hereinafter referred to as the QA/QC procedure. This QA/QC procedure is performed on the post submission data. There were four major elements in the Quality Assurance / Quality Control (QA/QC) procedure, namely; completeness, consistency (internal consistency), comparability and the accuracy of the ex-ante emission saving figures reported for each policy. The QA/QC procedure was implemented for the Member States submission reported in 2011 by the ETC-ACM. The data is presented in this report and included in the EEA's database on policies and measures[1] are the data following the QA/QC procedure.

The UNFCCC documents 'Guidelines for the preparation of national communications by Parties' (1999) and the 'Annotated Outline for Fifth National Communications of Annex I Parties' (no date)

[1] http://www.eea.europa.eu/themes/climate/pam

contains guidance on how the information on policies and measures should be reported. However, compared against the reporting of the historic inventory, which has standardised requirement for the reporting, guidelines for the compilation of GHG inventories (IPCC, 1997) and a formal review performed under the UNFCCC, the reporting of the information on policies and measures is less standardised and until 2011, there was no review procedure. In an effort to improve the comparability and consistency of the reported data, an optional template for the reporting of projections and policies and measures under the EU MM Decision (hereinafter referred as 'reporting template') was designed by the EEA and its European Topic Centre on Air pollution and Climate change Mitigation (ETC-ACM) in 2006 and made available to Member States. Furthermore, to increase the completeness and harmonise the reporting of information on Policies and Measures, a guidance document was also developed in 2011 (EEA, 2011b). For example, Annex A includes an indicative list of CCPMs provided to Member States to help assign PAMs to sectors.

Summary results of the QA/QC procedure is presented in Annex B to put the results presented in this report into perspective so the reader can appreciate the 'degree of confidence' which should be given to these results. Further detail on the quality of the policies and measures information reported by the Member States is in included in the Annex. The Annex qualitatively discusses the completeness, consistency and accuracy of the submissions against the requirements set out in the QA/QC procedure (EEA, 2011a). Annex C provides commentary on implementation of the QA/QC procedure.

2 Policies reported by Member States

Based on the information provided by the Member States in 2011 over 79% of PAMs were implemented or adopted and 20% were in the planning. The highest number of policies affects the energy supply and transport, followed by the industry and residential sectors. In terms the EU ETS and non ETS sectors, the non ETS sector are targeted by more policies than the ETS sector. The number of policies affecting each gas is in line with the percentage each gas accounts for in the historic inventory. CO_2 emissions are affected by the highest number of PAMs. The most recent five year period (2005-2009) has seen the highest number of policy implementation in the EU. This is likely to be as a direct effect of the ECCP II. 2004 was the single dominant year for policy implementation, where over 120 PAMs were implemented.

PAMs linked to CCPMs- Nearly three quarters of the reported policies were directly related to a CCPM:

- The top three reported CCPMs were; Landfill Directive (1999/31/EC), RES-E Directive (2001/77/EC) and the EU ETS (2003/87/EC). The list of the most reported PAMs match the policies expected to provide the largest emission savings according to the European Commission.
- A higher proportion of the policies linked to CCPMs affect the energy supply sector and the transport and residential sectors are affected less compared to all reported policies.
- The highest number of PAMs implemented solely as a result of national objectives affect the transport sector.

Policies implemented or adopted during 2009-2011- Of all reported PAMs, 21% were adopted or implemented between 2009 and 2011:

- A slightly lower number of policies introduced in recent years affect the energy use - industry/construction sector (10% in comparison to 15% for all PAMs) and the share of policies which affect the transport sector have increased slightly (22% in comparison to 19% for all PAMs). It is vital that additional PAMs are implemented in the transport sector in the future for the EU to meet emission reduction targets in 2020.
- The proportion of policies which use planning instruments is much higher in this sample of recently implemented policies compared to all reported PAMs (20% and 6%). This is as a result of a shift away from the implementation of economic policies (19% and 29%) and information measures (10% and 4%).
- Policies which have been implemented or adopted recently tend to affect both the EU ETS and non ETS sectors in comparison to the overall sample of PAMs which has affect one or the other.
- Policies which have been introduced in recent years are often linked to those CCPMs whose objectives align with the objectives set under the Energy and Climate Package (RES Directive (2009/28/EC) and End-use efficiency and energy services directive (2006/32/EC)).

The overall completeness of the mandatory qualitative information on PAMs reported in 2011 was high. The reporting of policies linked to EU wide CCPMs which should already be implemented at Member States varied across Member States from Luxembourg who only reported policies linked to 10% of the CCPMs in the indicative

2.1 Scope of analysis

This section presents the data reported by the Member States under Article 3.2(a) of the MM Decision. Member States are required to report information on policies and measures implemented on the national level. Information on CCPMs which are required to be implemented at national level should be included in the submission.

The following sections focus on the number of policies reported (rather than the emission savings as a result of the reported policies). Results on the expected emission savings from policies can be found in Chapter 3. Various data samples have been assessed to highlight differences and key time thresholds in the implementation of national policies:

Section 2.3 looks at the overall sample of PAMs, including CCPM-related and non-CCPM related measures.

Section 2.4 focuses on the policies implementing CCPMs and national policies linked to CCPMs addressing GHG emissions.

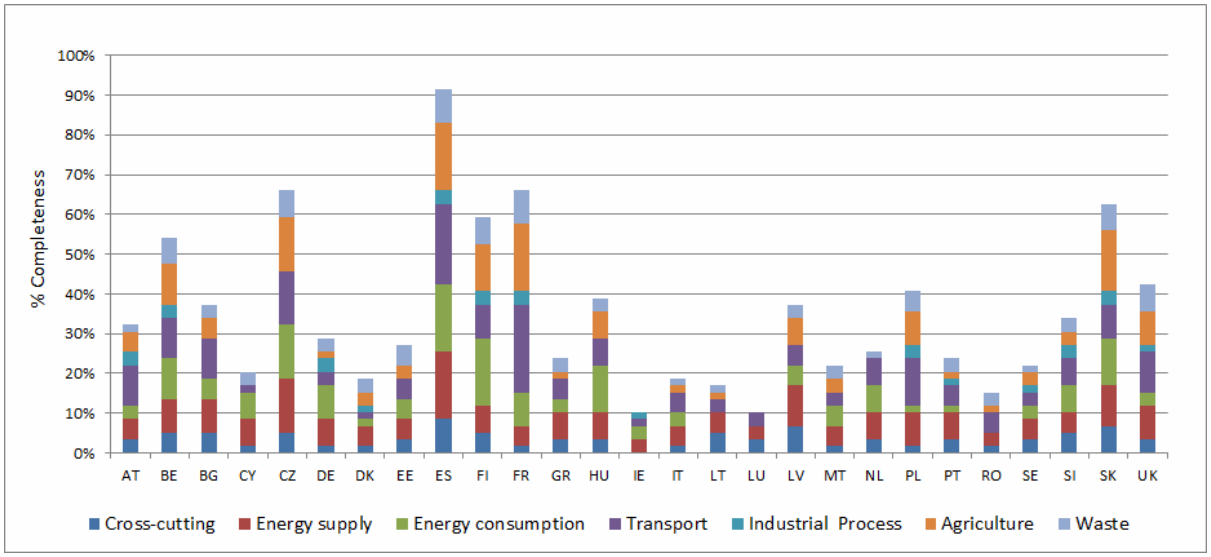
In section 2.5 the most recent PAMs implemented or adopted have been assessed (the sample covers the years 2009-11) to understand if new patterns are forming in policies in place in Member States.

2.2 Quality of submissions

The robustness of this assessment is dependent on the quality of the policies reported by the Member States. The completeness of the reported data presented in this chapter gives a good presentation of the quality. The largest number of PAMs were reported in France (187), followed by 109 in Belgium and 91 in Malta. The smallest number of PAMs was reported by Lithuania (14), followed by 19 PAMs in Romania and Cyprus, and 24 PAMs in Slovakia and Slovenia. The data indicate that reporting of PAMs may not be homogenous across Member States.

The completeness of the EU wide policies can provide an indication of whether all the policies which should be implemented in Member States have been reported. Figure 2-1 shows that the completeness varies across the Member States from 10% (Luxembourg) to 92% (Spain).

Figure 2-1 Completeness of the reporting of EU policies by Member State



Source: ETC/ACM 2011

In addition, the completeness of the specific detail of the policy information required under the MM Decision varied. Of the total 1,397 policies reported:

- The information on the implementation status was reported for the majority of PAMs by most Member States and only unspecified for 11 PAMs;
- The type of policy instrument used was only incomplete for 23 PAMs. The majority of these policies were those reported by Poland;
- The information on the sector targeted by the policy was reported for all policies;
- Information on whether the policy affects the EU ETS or the non ETS sector was not reported for 70 policies (excluding where the information was incomplete by Denmark, Germany and Portugal because in 2009 this information was not requested). The reporting of this information is high considering it is not a mandatory requirement requested for the first time in 2011.
- The gas affected by the policy was complete for most policies. Only 14 policies were missing this information.
- The information on the starting year of the policy was only reported for just over half the policies. This information is non-mandatory.
- The link with EU policies was not reported for 112 policies.

The consistency, comparability and accuracy of reported information cannot be discussed quantitatively, but the QA/QC procedure followed give an indication of the quality in terms of these elements. Where issues related to completeness, consistency and comparability were found then questions and clarifications are requested from the Member States by the reviewers. As many issues as possible were resolved during the communication process which involved communicating with the Member state a minimum of three times. However, ultimately, due to the lack of response and unavailability of the information by Member States, some quality issues were unresolved. Thus, the response rate by the Member State gives a good guidance on the efforts made by the Member State to

improve the quality of the reported information and also the consistency, comparability and accuracy of the reported data (c.f Annex B).

2.3 Characterising the full sample of all national measures (All PAMs)

As a starting point this section assesses the full sample of PAMs, including CCPM and non-CCPM related PAMs and provides information on any dominant patterns across Member States.

Status of implementation

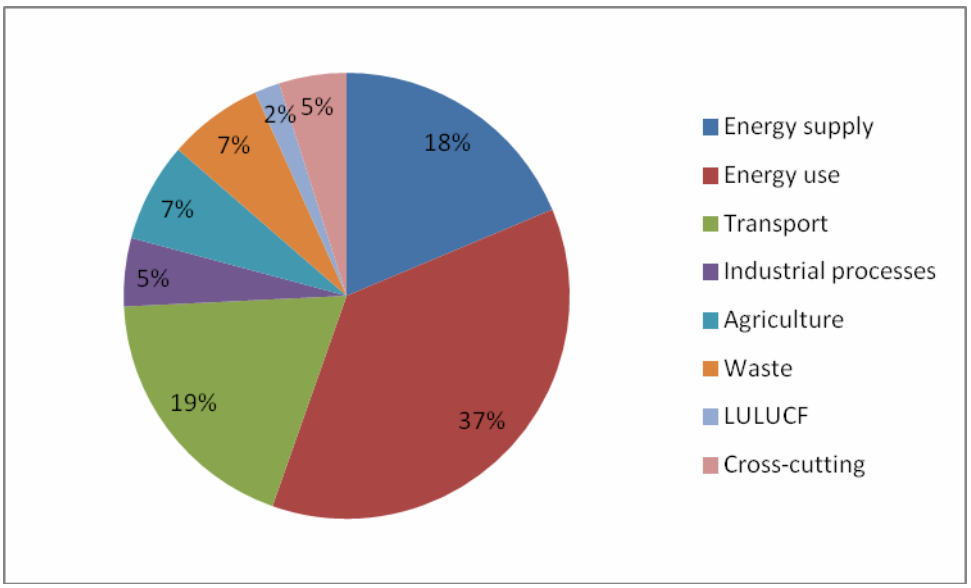
70% of all reported PAMs were implemented by the time the Member States sent through their reports (including 4% of expired measures), 9% were adopted and 20% were in the planning.

Sectors affected

Figure 2-2 demonstrates that when looking at the full sample of PAMs, most of the national actions (PAMs) reported (overall 37%) are taking place in the Energy use/consumption sector (with 15% effecting the industry sector, 14% the residential sector and 8% falling to other energy use), shortly followed by the energy supply and transport sectors, both being affected by 19% of the PAMs. 7% of PAMs fall in both, the agriculture and waste sector, 5% are related to Industrial processes and only 2% to Land Use, Land Use Change and Forestry (LULUCF). 94 measures reported fall into more than 1 sector and are hence cross-cutting.

It is important to note that some of the assessed measures are cross-cutting in that they affect more than 1 sector (roughly 8%). The report has accounted for these crosscutting measures in the above numbers in assuming a separate measure per sector influenced. Policies often do not target a single sector and it would not be an accurate reflection to assign these cross cutting policies to one sector. The percentage of the reported policies affecting each sector provides an indication of how many policies are having an effect on the sectors to reduce emissions. This reflects the proportion the sectors account for in the EU-27 inventory.

Figure 2-2: Sectors affected by all PAMs



Source: ETC/ACM 2011

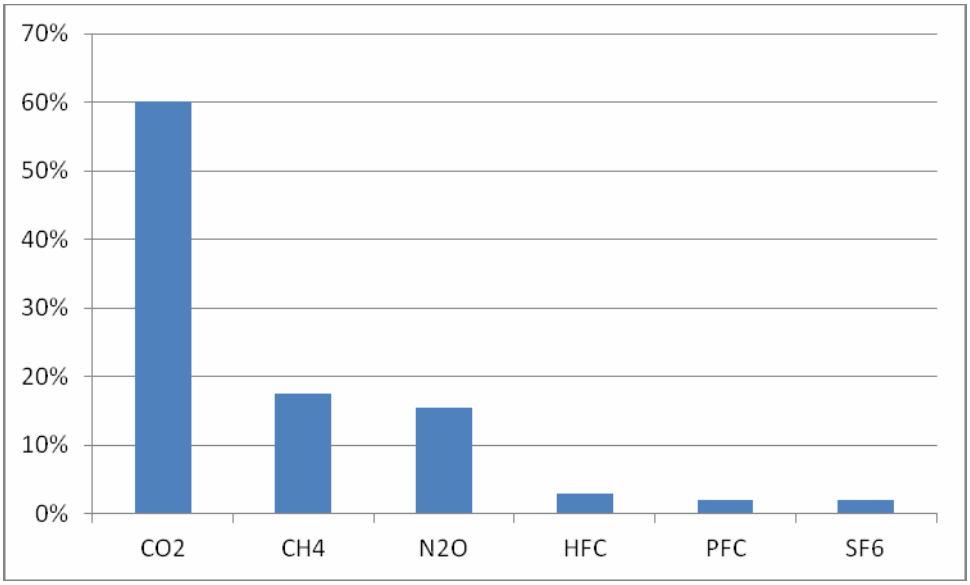
EU ETS sector coverage

From all PAMs reported, 12% are covering only the EU ETS traded sectors, 47% are targeting only non-ETS traded sectors and 21% are targeted at both. For the remaining 19% of measures the value was non-reported.

Gases effected

As demonstrated in Figure 2-3, 60% of all national measures reported, are targeting the reduction of management of carbon dioxide (CO_2), 17% target methane (CH_4) closely followed by Nitrous oxide (N_20). HFC, PFC and SF_6 are only covered by 2% to 3% of all measures. This is in line with the percentage each gas accounts for in the EU-27 GHG inventory. In 2009, 82% of the overall emissions were CO_2, 9.0% from CH_4, 9.4% from N_2O and 1.8% from F-gases (EEA, 2011c).

Figure 2-3: Gases affected by all PAMs



Source: ETC/ACM 2011

Type of instruments used

Regulatory instruments dominated with 30% of all PAMs, followed by 29% economic instruments, and 10% information measures.

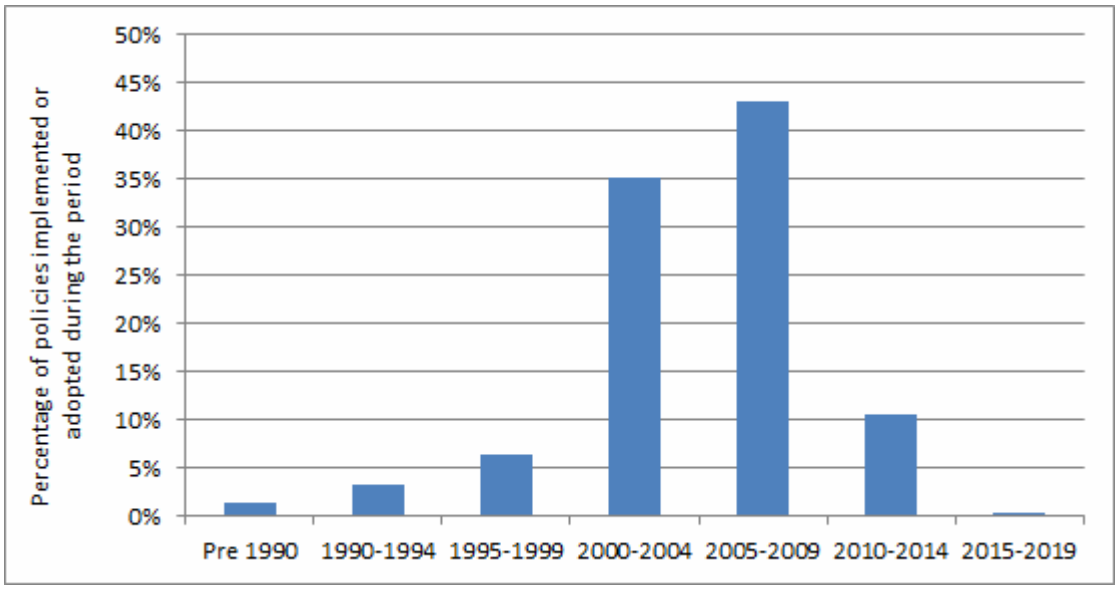
Dominant time periods for implementation

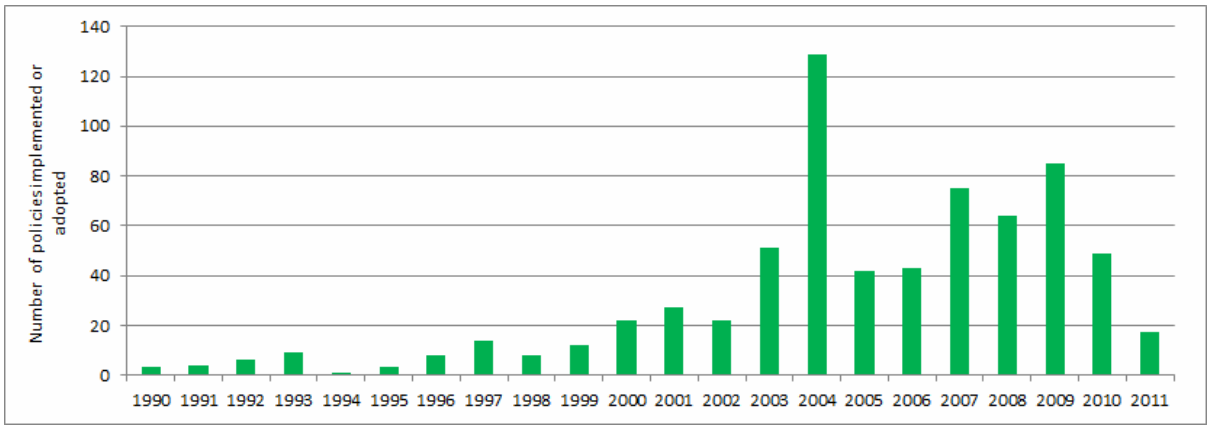
From all national measures reported, 35% have been implemented or adopted between 2000 and 2004 (possibly as a direct effect of the European Climate Change Programme, ECCP I). 43% were implemented (or adopted) between 2005 -2009 (possibly as a direct effect from ECCP II. Only 11% of all measures were implemented or adopted before 2000.

2004 was by far the single dominant year of policy implementation. Between 2004 and 2005, the number of policies implemented fell significantly. Since then, until 2009, the number of policies

implemented each year has in general increased. The fall in the number of policies implemented between 2009 and 2010 may reflect the budget cuts in government spending which has taken place in some Member States. The number of policies implemented or adopted in 2011 is much lower because the data was reported by the Member States in early 2011. It is important that new PAMs continue to be implemented in the EU to ensure that emission reduction targets in 2020 are met.

Figure 2-4: Dominant time periods and year for PAMs implementation





Source: ETC/ACM 2011
Note: Policies with no starting year or where more than one starting year was specified have been excluded

2.4 Contribution of EU policies to national PAMs implementation

This section considers PAMs that are either directly linked to a CCPM (i.e. that are implementing national obligations under European climate and energy policies as outlined above) (c.f section 2.4.1) then PAMs which are not linked to a CCPM (c.f section 2.4.2).

National policies and measures (PAMs) and EU CCPMs are often closely linked, as European Directives require Member States to enact legislation to implement them (which European regulations and voluntary agreements do not). National PAMs in place in Member States can therefore result from the implementation of EU CCPMs, but can also be driven by specific national policy objectives

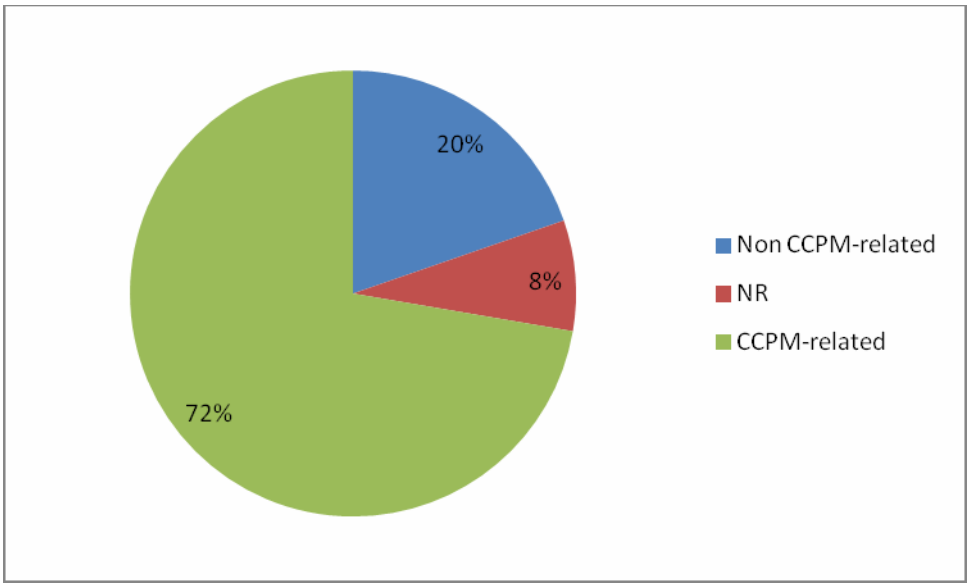
that are not necessarily related to the EU-wide CCPMs. As Member States under the MM Decision are not required to provide specific data on how their PAMs are related to EU Policies, but only to provide an indication if and to which CCPMs their PAMs are linked to, no assessment of whether the EU policies triggered national policies can be given. However, if a PAM is reported by the Member States in relation to a CCPM we can assume that this specific PAM has been enacted to implement the respective CCPM or has been enacted independent of the CCPM but is used to fulfil Member States obligation on the European level. We can hence draw a direct connection between the PAMs reported as related to CCPMs as national implementation of European policies. In the 2011 submission, in an effort to distinguish these policies linked to national objectives from the CCPMs, Member States were asked to identify those PAMs which address only national objectives (that is those which are not associated with CCPMs.

2.4.1 CCPM-related PAMs

CCPMs demonstrate the collective determination of the EU-27 to take action on climate change and they help to deal with competitiveness concerns of Member States. The European Commission has taken many climate-related initiatives since 1991, when it issued the first Community strategy to limit carbon dioxide (CO_2) emissions and improve energy efficiency.

72% of all PAMs reported were reported as directly related to a CCPM. 20% were reported as independent national or "non-CCPM policies" (see Figure 2-5).

Figure 2-5: Split between CCPM and non-CCPM related measures



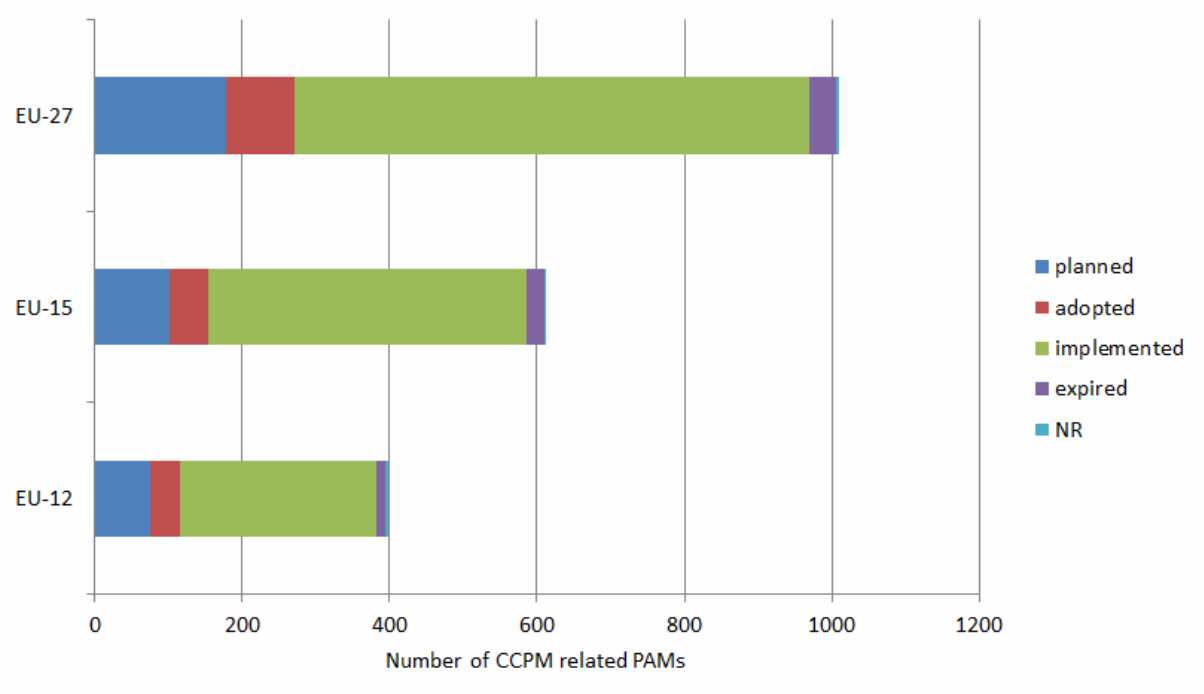
Source: ETC/ACM 2011
Note: "NR" corresponds to PAMs where information on the link with CCPMs was not reported.

Status of implementation

Of all CCPM-related measures, 72% were implemented by April 2011 (including 3% which are expired measures), 9% were adopted and 18% were in the planning.

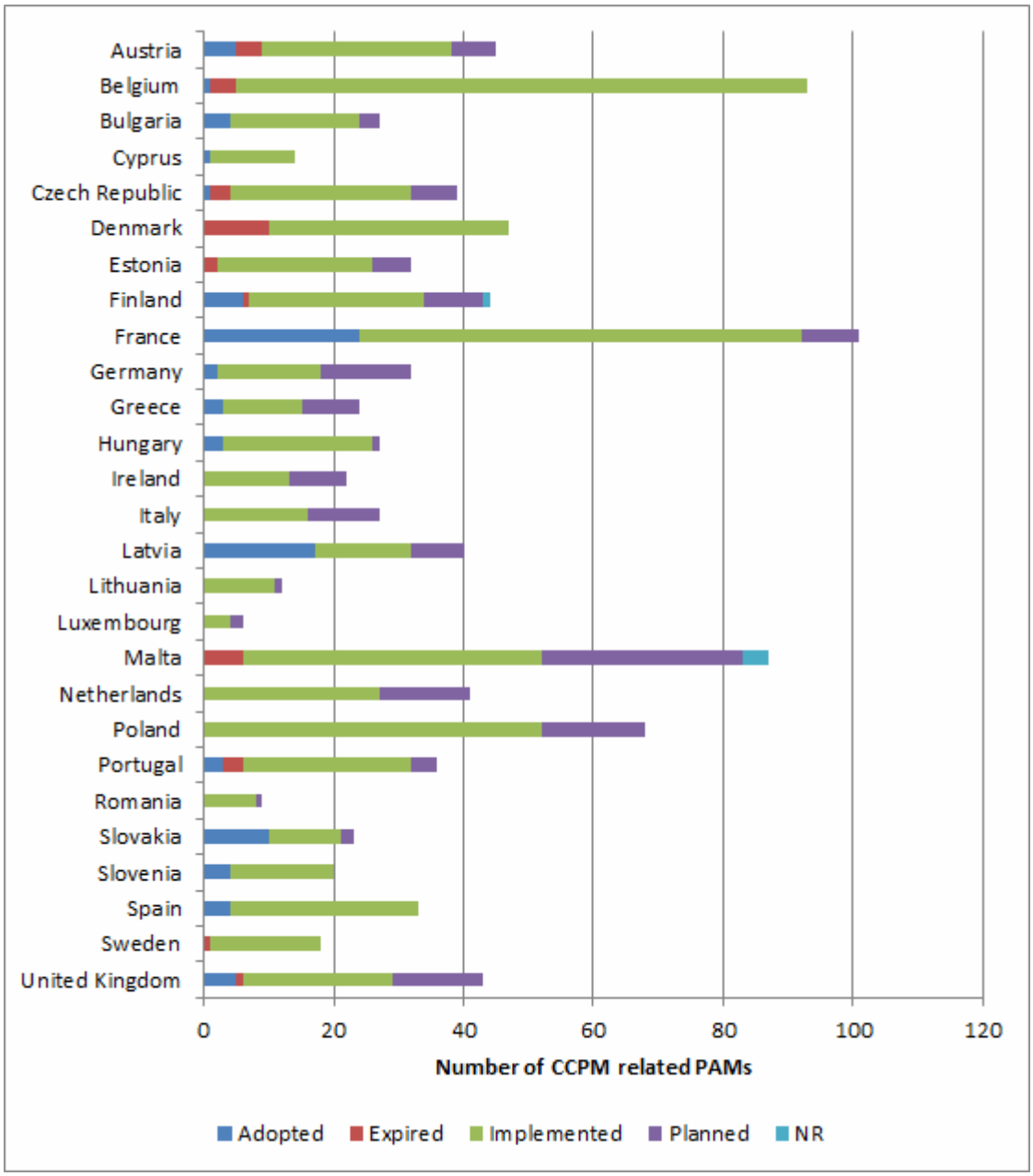
Regarding the implementation status of CCPM-related PAMs, the EU-12 has fewer implemented measures than the EU-15 with an average of 23.2 implemented measures and 30.4 implemented measures per country (including expired measures but excluding adopted measures) respectively. However, there are big differences in numbers within these two groups as demonstrated in Figure 2-7. For example, in the EU-15 sample, Germany reported only 16 implemented measures while Belgium reported 88. For the EU-12, Poland has implemented most CCPM related PAMs with 52 followed by Malta with 46; Romania has only eight implemented measures in this category. The differences indicate that comparison of numbers of PAMs reported by individual Member States should be considered with extreme care.

Figure 2-6 Status of CCPM related measures in the EU-12, EU-15 and EU-27



Source: ETC/ACM 2011

Figure 2-7: Status of CCPM related measures in EU Member States



Source: ETC/ACM 2011

Coverage of CCPMs in Member States reporting

There also seems to be a wide gap in between Member States regarding the coverage of different existing CCPMs in their reporting. Spain reported links between national PAMs and 92% of the CCPMs included in the indicative list in the reporting template (c.f Figure 2-1), followed by the Czech Republic (66%), France (64%) and Slovakia (63%). Luxembourg reported links between national PAMs and CCPMs (10%), Romania (14%) followed by Italy and Latvia with 17%. The top eight CCPMs related to PAMs that were reported across countries were:

- Waste: Landfill Directive (Directive 1999/31/EC) (reported by 24 countries)

- Energy supply: Electricity production from renewable energy sources (Directive 2001/77/EC, the RES-E Directive) (reported by 23 countries)
- Cross-cutting: EU ETS directive 2003/87/EC as amended by Directive 2008/101/EC and Directive 2009/29/EC (reported by 22 countries)
- Energy supply: Promotion of cogeneration (Directive 2004/8/EC) (reported by 21 countries)
- Energy consumption: End-use efficiency and energy services (Directive 2006/32/EC) (reported by 21 countries)
- Transport: Biofuels Directive (Directive 2003/30/EC) (reported by 21 countries)
- Energy supply: RES directive (Directive 2009/28/EC) (reported by 20 countries)
- Energy consumption: Energy performance of buildings (Directive 2002/91/EC, the EPB Directive) (reported by 17 countries)

The CCPMs to which links were least reported were:

- Energy supply: Completion of the internal energy market (including provisions of the 3rd package) (reported by 2 countries)
- Energy consumption: Motor challenge programme (reported by 2 countries)
- Energy supply: European Energy programme for Recovery (Regulation 2009/663/EC) (reported by 1 country)
- Transport: Labelling of tyres (Regulation 1222/2009) (reported by 1 country)
- Transport: Environmental performance freight transport (Marco Polo Programme) (reported by 6 countries)

There is a general trend that the policies reported by most Member States are those that are expected to provide the largest emission savings according to the European Commission's estimates (see section 3 for more information on European Commission estimates of emission savings from EU policies). Of the top nine policies which the European Commission expects most emission savings from, six are also included in the eight most frequently reported CCPMs :

- the RES-E Directive,
- the EU ETS Directive ,
- the End-use efficiency and energy services directive,
- the Transport Biofuels Directive ,
- the RES directive and,
- the EPB Directive.

The three remaining CCPMs that the Commission estimate to provide major savings were mentioned less frequently:

- the Strategy for cars CO_2 directive (Regulation 443/2009) reported by 12 countries,
- the Kyoto Protocol project mechanisms directive (Directive 2004/101/EC) reported by 10 countries and,
- the Internal market in natural gas directive (Directive 98/30/EC) reported by 8 countries.

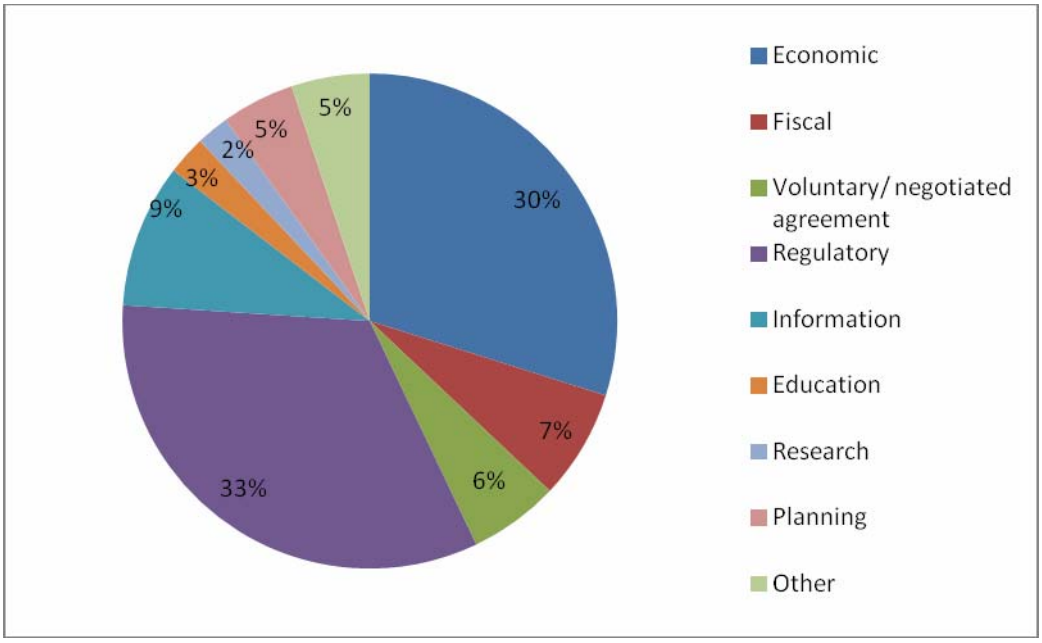
However, it has to be noted that the Regulation 443/2009 is a comparatively recent instrument.

The top eight CCPMs most reported by Member States also tend to be those with quantified targets for specific objectives, for example the Landfill Directive includes targets to reduce the biodegradable waste going to landfill to 75% of 1995 figures by 2010 and to 35% by 2020 and the RES-E Directive sets indicative targets for the contribution of electricity produced from renewable energy sources to gross electricity consumption by 2010 for each Member State. In contrast, the policies which are reported by Member States the least tend to be either policies which have been transposed into EU legislation recently (Transport: Labelling of tyres (Regulation 1222/2009) and European Energy programme for Recovery (Regulation 2009/663/EC)) or, policies where the objective is broad without a quantified target.

Type of instruments used

Of all CCPM related national policies 33% were implemented (or were planned to be implemented) via regulatory instruments, and 30% by economic instruments. Information campaigns (9%), fiscal instruments (7%), and industry agreements (6%) were other prominent tools used by Member States to meet European obligations.

Figure 2-8: Types of instruments used for CCPM related national policies



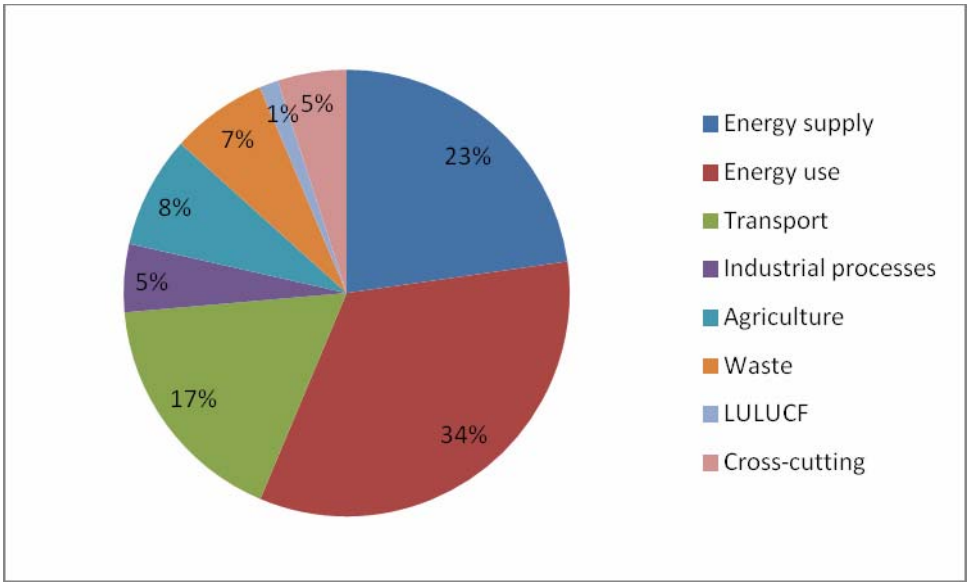
Source: ETC/ACM 2011

Sectors affected

As shown in Figure 2-9, the energy use sector was strongest effected in this category with 34% of all CCPM related PAMs implemented in the sector (this is calculated by adding up three energy use sub sectors 14% fall in the industry and construction sector, 11% in the residential sector and 9% in other Energy use related sectors). This was followed by the energy supply sector with 23% of all CCPM related measures implemented in this sector. The transport sector was targeted with 17% of all measures, the agricultural sector with 8% and the waste sector with 7%. Industrial processes followed with 5% and LULUCF with 1% of all measures. A higher proportion of the policies linked to CCPMs affect the energy supply sector and the transport and residential sectors are affected less compared to all reported policies.

Energy supply and energy use sectors accounted for 32% and 27% of the emissions in 2009 and as a result PAMs in these sectors are able to target the sources with the highest emissions which in turn increases the potential emission reduction which can be achieved from the PAM. Thus, Member States are likely to be implementing more policies in these sectors where the GHG mitigation potential is the highest. In future years, the balance may shift to more policies being introduced in the transport and other sectors which are not covered under the EU ETS as a result of the Effort Sharing Decision (ESD) which sets an emission reduction target to be met in 2020 for Member States to reduce emissions in the non-traded sector (not covered under the EU ETS).

Figure 2-9: Sectors affected by all CCPM related PAMs



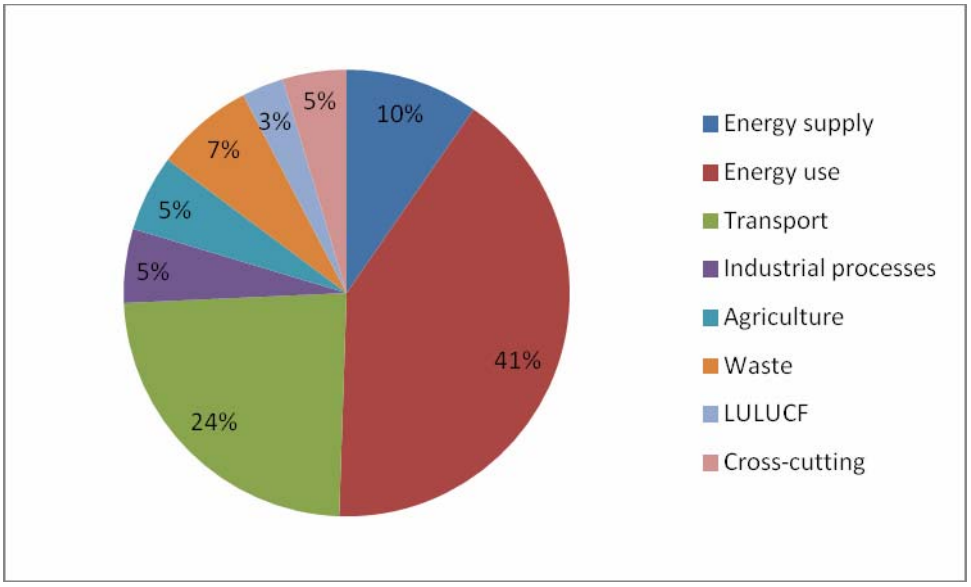
Source: ETC/ACM 2011

2.4.2 Non-CCPM related PAMs

It is also important to recognise the PAMs which are implemented as a result of Member States' national objective (non CCPM policies).

The data indicate that of the **384 non-CCPM related national measures** (28% of all PAMs reported) 41% are targeting the energy use sector (shared across the residential sector with 18%, industry and construction with 16% and other energy use related sectors with 8%). 24% of non-CCPM measures were implemented in the transport sector, 10% in the energy supply sector and 7% in the waste sector, followed by 6% in the agricultural sector, 5% industrial processes and 3% LULUCF. 5% of all measures were cross cutting. Comparison of Figure 2-9 and Figure 2-10 provides insight into the sectors where non-CCPM PAMs are more common. The energy supply sector had the second largest share of policies when all policies are assessed but the share of non-CCPM related PAMs which affect the energy supply sector is much lower (10%). This indicates that many PAMs to reduce emissions from the energy supply sector are largely associated with CCPMs. In the transport sector comparatively few PAMs are associated with CCPMs.

Figure 2-10: Sectors affected by all non-CCPM related PAMs



Source: ETC/ACM 2011

62% of these non-CCPM related measures targeted the reduction of CO_2, and 16% CH_4 and N_2O respectively. HFC, PFC and SF_6 were targeted with 2% of all measures each. This echoes the proportion each gas accounted for in the 2009 EU-27 inventory.

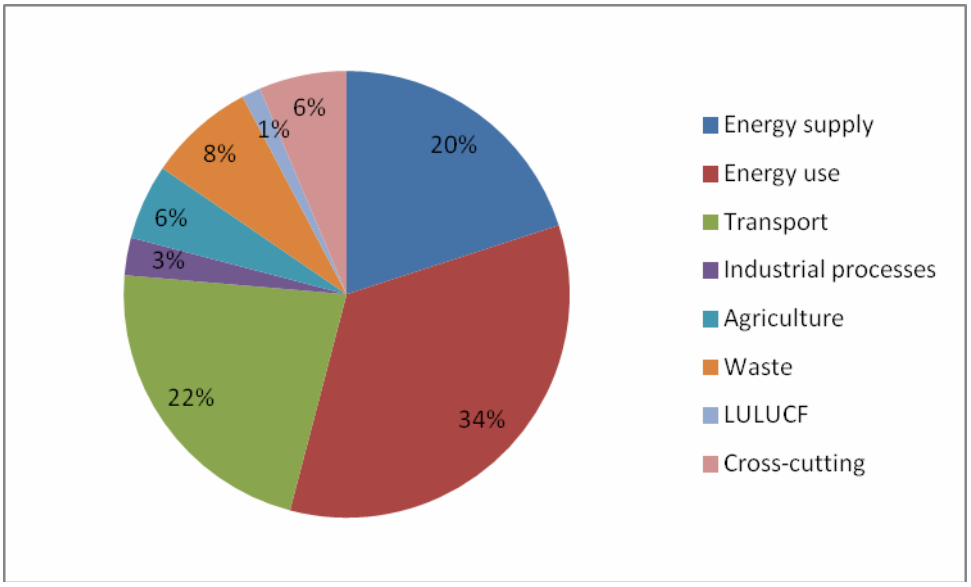
2.5 Recently implemented or adopted PAMs (2009-11)

154 of the reported PAMs (21% of the overall number) were adopted or implemented between 2009 and 2011. The section below takes a closer look at these recently implemented PAMs.

Sectors affected

34% of all **PAMs** adopted, implemented or expired in this time span, were affecting the Energy use sector (adding up energy use in the industry and construction sector (10%), the residential sector (15%) and other energy use related sectors (8%)). 26% of PAMs between 2009-11 impacting on the Energy supply sector and 22% on the Transport sector. The agricultural sector was affected by 8%, waste by 5% and LULUCF by 1% of all recent PAMs implemented. No significant difference between the relative proportions of the sectors that are being affected by recent policies can be observed. Slightly less policies affecting the energy use - industry/construction sector have been implemented or adopted recently (10% in comparison to 15% for all PAMs) and the share of policies recently implemented or adopted affecting the transport sector have increased slightly (22% in comparison to 19% for all PAMs). During 1990-2009, emissions from all sectors fell in the EU-27, excluding the transport sector where emission increased by 21% (EEA, 2011c). A higher share of PAMs affecting the transport sector in recent years is may highlight an increase in the effort by the Member States and at the EU level to curb further increase in emissions. It is also likely to reflect the need for Member States to implement further PAMs in the transport sector now to meet the GHG emission targets set under the ESD.

Figure 2-11: Sectors affected by all PAMs implemented, adopted or expired between 2009 and 2011

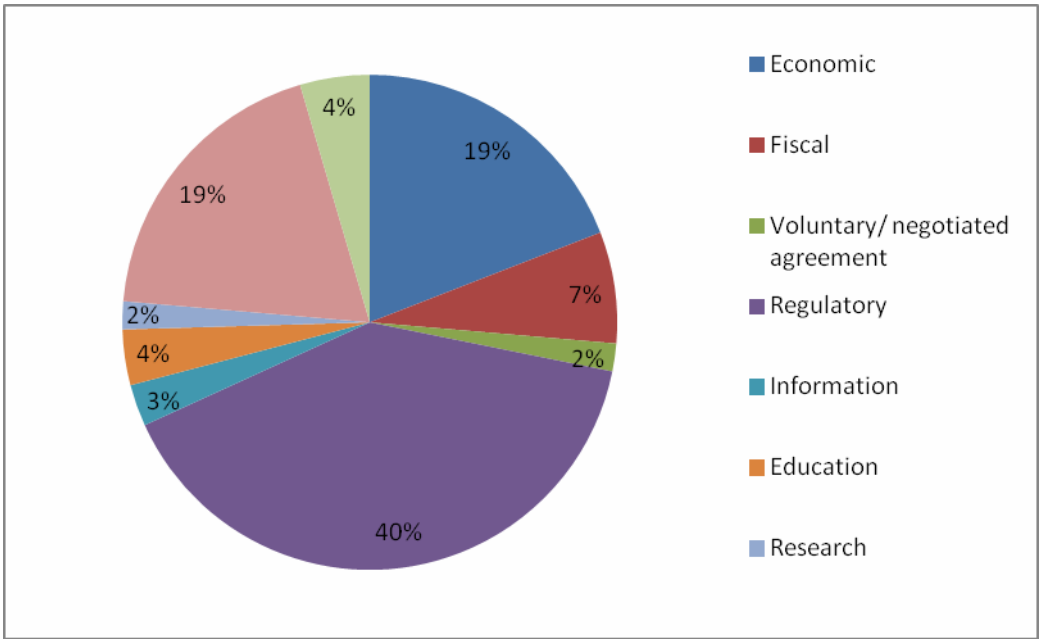


Source: ETC/ACM 2011

Type of instruments used

From all of these PAMs recently implemented or adopted, the dominant number (29%) use regulatory instruments, followed by 20% planning instruments, 19% economic instruments and 11% fiscal instruments. The proportion of policies which use planning instruments is much higher in this sample of recently implemented policies compared to all reported PAMs (20% and 6%). This is as a result of a shift away from the implementation of economic policies (19% and 29%) and information measures (10% and 4%) in recent years. The majority of these policies which use planning instruments has recently been implemented or adopted in France and are linked to the RES directive (Directive 2009/28/EC) and European Commission directives aiming at shifting the balance between modes of transport, in particular towards rail (2001/12/EC, 2001/13/EC, 2001/14/EC of 15/03/01 Regulation 881/2004 of 29/04/2004, 2001/49/EC, 2001/50/EC, 2001/51/EC of 29/04/2004). Other instruments such as information campaigns, education, research or joint agreements are used to a minor extent (between 2-4%).

Figure 2-12: Types of instruments used for PAMs implemented, adopted or expired between 2009-11



Source: ETC/ACM 2011

EU ETS sector coverage

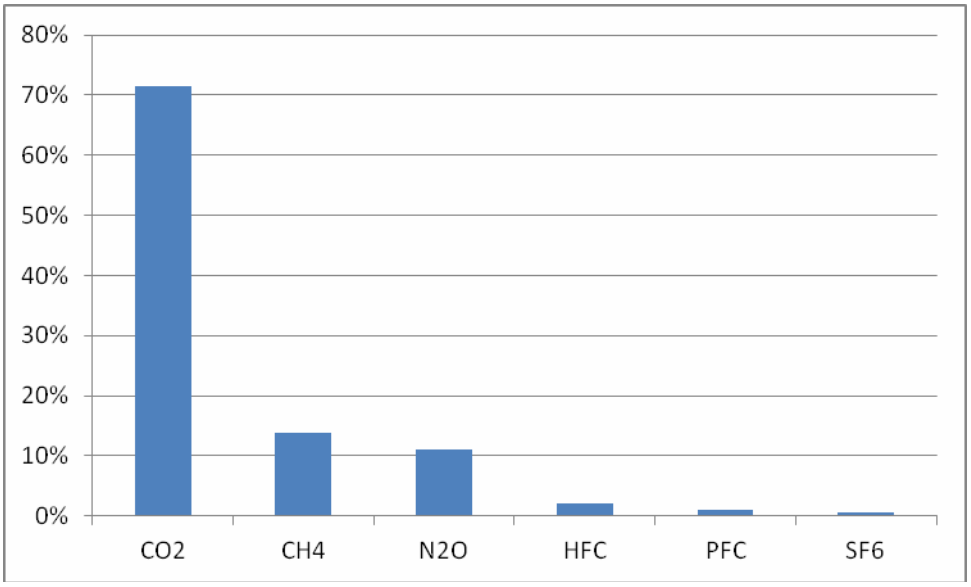
For those PAMs reported as implemented, adopted or expired between 2009 and 2011, 7% are targeting only the EU ETS traded sectors, 37% are covering only non ETS sectors and 40% of measures are targeting both. For the remaining 15% of measures in this time span the value was non-reported. Compared to all the reported policies, this sample of recently implemented policies show a slight fall in the policies affecting the ETS sector (7%, down from 12%) and the non ETS sector (37%, down from 47%). There is no clear change between recent PAMs and the full sample of PAMs regarding whether the ETS or non ETS sector is affected. This is likely to be because the objectives under the Energy and Climate Package cover both emission in the both ETS (increase in share of renewable energy use) and the non ETS sectors although the emission reduction target for 2020 is solely for the non ETS sector.

There is a significant (40%, up from 21%) increase in policies, in the sample of recently implemented policies, which affect both the ETS and non ETS sectors. This shows that recent policies tend to affect large combustion sources and other sources, rather than targeting a specific source. This may reflect the high number of overarching strategy policies which aim to reduce emissions from society in general reported in 2011.

Gases affected

Looking at the gases covered through these recent measures, 71% of all PAMs from 2009-2011 targets CO_2 related emissions, 14% CH_4, 11% N_2O and 2% HFC. PFC and SF_6 were covered with only 1% of the measures. Comparison with Figure 2-3 (gases affected by all PAMs) indicates a slightly higher proportion of recent PAMs affecting CO_2.

Figure 2-13: Gases affected by all PAMs implemented, adopted or expired between 2009 and 2011



Source: ETC/ACM 2011

CCPMs implemented through most recent PAMs

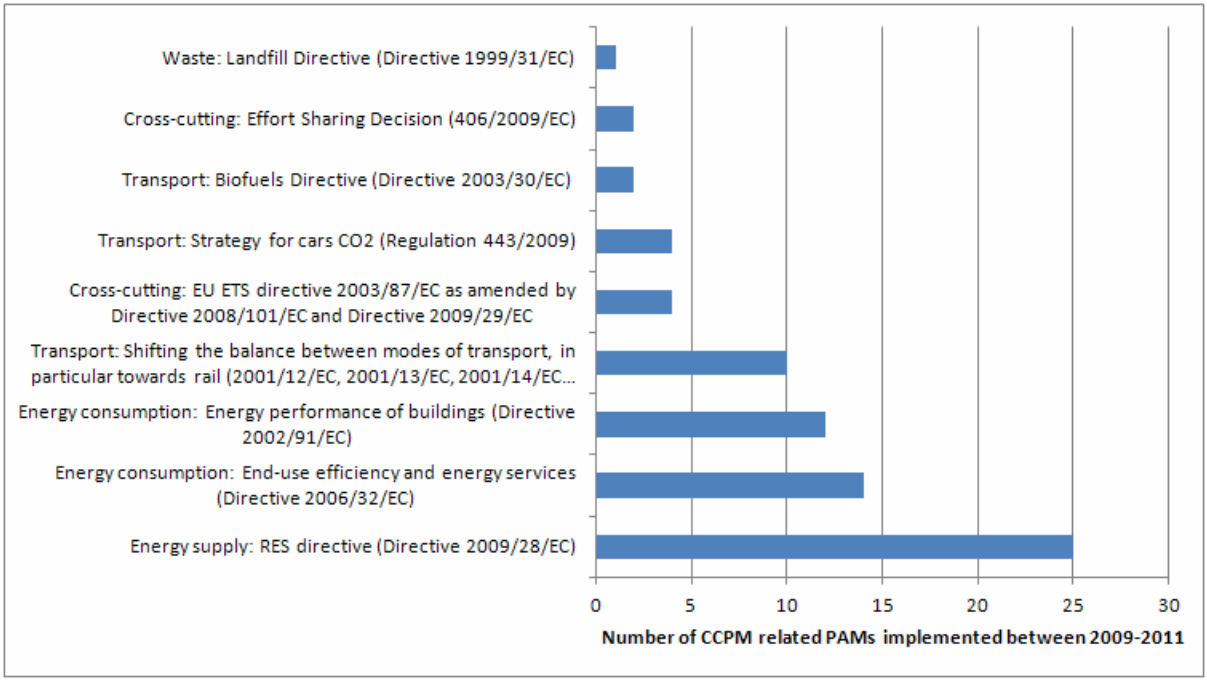
As demonstrated by Figure 2-14, for the **CCPM related PAMs** implemented, expired or adopted between 2009 and 2011:

- a big majority (25 measures reported) related to the RES directive (Directive 2009/28/EC).
- 14 measures related to the End-use efficiency and energy services directive (Directive 2006/32/EC),
- 12 PAMs implemented the Energy performance of buildings directive (Directive 2002/91/EC)
- 10 related to European Commission directives aiming at shifting the balance between modes of transport, in particular towards rail (2001/12/EC, 2001/13/EC, 2001/14/EC of 15/03/01 Regulation 881/2004 of 29/04/2004, 2001/49/EC, 2001/50/EC, 2001/51/EC of 29/04/2004).
- Other directives were only implemented to a minor extent, e.g. the Strategy for cars CO2 (Regulation 443/2009) with four measures or the Biofuels directive (Directive 2003/30/EC) with 2 measures between 2009 and 2011.

As might be expected, the policies which have been introduced in recent years are often linked to those CCPMs whose objectives align with the objectives set under the Energy and Climate Package (which became a law in June 2009). Policies linked to the RES directive (Directive 2009/28/EC) and the Biofuels directive (Directive 2003/30/EC) will play a key role to meeting the requirement for '20% of the EU energy consumption to come from renewable sources', and the End-use efficiency and energy services directive (Directive 2006/32/EC) and Energy performance of buildings directive (Directive 2002/91/EC) will be crucial in meeting the target '20% reduction in primary energy use compared to projected levels, to be achieved by improving energy efficiency'. Transport emissions have increased

by 21% during 1990-2009, thus it is interesting that two transport CCPMs appear in the dominant CCPMs linked to policies which were introduced in recent years. This is likely to reflect the Member State's needs to reduce emissions from the transport sector in future years under the ESD.

Figure 2-14: Dominant CCPMs related to PAMs implemented or adopted between 2009 and 2011



Source: ETC/ACM 2011

3 Most important quantified emission savings from policies

Of the total 1,397 PAMs reported, quantified emission savings were complete for approximately half. The completeness of the emission savings are highest for 2020, where Bulgaria, Cyprus, the Czech Republic, Greece, Ireland, Italy, Malta and the United Kingdom reported quantified emission savings for all PAMs. Romania and Poland did not quantify 100% and 95% of their emission savings for 2020 respectively.

Total emission savings

The energy supply and the cross-cutting sector has the largest reported sectoral savings in 2010, 2015 and in 2020. The share of emission savings by sector shifts slightly between 2010 and 2020. Higher proportion of the savings result in the energy supply (36% to 39%), energy use – industry (8.8% to 13%) and the transport sector (9.4% to 14%) in 2020 compared with 2010. In turn, the share held by industrial processes (3.8% to 2.5%), agriculture (2.1% to 1.0%), waste (1.9% to 1.2%), LULUCF (1.6% to 0.3%) and cross-cutting sectors fell (24% to 27%). The Member States that reported highest emission savings are those with large emission inventories (Germany, the United Kingdom, Italy and Spain). When the emission savings are calculated as a % of their projected emissions, Sweden, Greece, Bulgaria and Cyprus have the largest emission savings relative to their projected emission levels.

Energy supply

Large emission savings are expected from Germany, Spain, Greece, the United Kingdom and Italy. In 2010, the policy that delivered the most savings was Spain's promotion of generation from wind energy. By 2020, it is anticipated that Germany's Renewable Energy Act will deliver the largest emission savings. The key CCPMs influencing the sector are the RES-E and the RES Directive. National policies linked to these CCPMs are comparatively well reported, but despite this the total emission savings from these policies is still under half of that expected by the European Commission.

Energy Use

The energy use sector is commonly the second most important sector after energy supply. The emission savings which are quantified are influenced heavily by the savings of Germany, the United Kingdom and Italy. Electricity conservation in Germany and the United Kingdom's Renewable Heat Incentive are key policies delivering savings by 2020. This sector has a larger contribution from non-CCPM national policies which contribute more than 50% of the savings in 2010.The influential CCPMs are the end-use and energy services Directive and the energy performance of buildings Directive.

Transport

The transport sector is the third most important sector delivering emission savings (excluding cross-cutting). Emission savings are frequently quantified, but often associated with smaller emission savings. The Biofuels Directive is the most influential CCPM in 2010 (with 13 and 15 Member States quantifying emission savings in 2010 and 2020). In 2020, the strategy for cars overtakes the Biofuels Directive as the most influential policy but this is mainly due to the large emission savings anticipated in Italy and fewer Member States link to this CCPM. There is under reporting of emission savings from the voluntary agreements with car manufacturers (five Member States in 2010 and four Member States in 2020). However, this was still an influential CCPM.

Industrial Processes

The emission savings from industrial processes are lower than the emission savings expected in the sectors linked to energy consumption. According to the quantified emission savings the majority of savings in 2020 are expected to come from France, the Netherlands and Belgium. More than 70% of quantified emission savings are linked to CCPMs. The most influential is the F-gas regulation in both 2010 and 2020. However by 2020, the EU ETS and the IPPC Directive are also expected to deliver large national savings.

Agriculture

The total quantified emission savings in the agricultural sector are low. Despite 15 Member States quantifying emission savings in the sector, no Member State reports savings of greater than 3 Mt CO_2-equivalent. Notable savings are expected from Denmark's Aquatic Environment Action Plan I and II and the Action Plan for Sustainable Agriculture, which are expected to have delivered 2.2 Mt CO_2-equivalent in 2010 and the UK's delivery of the English Agriculture sector Greenhouse Gas Action Plan (GHGAP) in 2020. The most influential CCPMs are the Nitrates Directive and the Common Agricultural Policy (CAP) related directives and regulations.

Waste

Emission savings in the waste sector are relatively low compared to other sectors. The contributions of Italy, Greece, Sweden and Spain are responsible for more than 50% of quantified emission reductions in the sector. The most common policies quantified are associated with the largest emission source from the waste sector - diversion of landfill waste. Thus, the most influential policy is therefore the Landfill Directive, but this is still only quantified by six Member States in 2010 and 2020.

Cross-cutting

Many policies affect more than one sector hence emission savings are large for cross-cutting measures. The estimates of France, the United Kingdom and Germany are particularly influential at EU level. The largest savings from a single measure come from Sweden's CO_2 tax (non CCPM National Policy). The EU ETS is the most influential CCPM in 2010 and 2020 and by 2020, the largest emissions savings are expected in France with estimated savings of 21 Mt CO_2-equivalent and in Germany with estimated savings of 15 Mt CO_2-equivalent.

3.1 Scope of chapter

This section sets out the policies and measures that are expected to deliver the largest emissions savings as reported by Member States in their submissions.

Section 3.3 is a summary of the emission savings estimated by Member States using a bottom-up approach.

In sections **Error! Reference source not found.** to 3.11, the results are discussed in closer detail by sector. These are discussed together in the All PAMs section (where policies are linked to a CCPM this is stated). In the CCPM-related PAMs section, the contribution of CCPM-related policies is discussed and the key CCPMs with the largest emission savings for each sector are highlighted.

Following this, for each sector the quantified CCPM emission savings reported in Member States submissions to the anticipated emission savings for particular key CCPMs made by the European Commission are compared. Whilst these estimates will not be directly comparable, due to the completeness of the Member States' submission, difference in methodology, assumptions and model, it is nevertheless interesting to explore the relative scales of the projected savings.

3.2 Quality of submissions

Most estimates from Member States were reported in 2011 with the exception of Denmark, Germany, and Portugal where no changes were made to the 2009 submissions. The completeness of the qualitative information reported by the Member States for individual policies was high. But the completeness of the EU wide policies, which provide an indication of whether all the policies that should be implemented in Member States have been reported, varies widely across the Member States (c.f Section 2.2). Furthermore, it should be noted that it was rare for Member States to have quantified all their policies and measures, and although the completeness of the quantified emission saving improved during the review, there were still a number of Member States for which the completeness of mandatory quantitative information was low. Of the total 1,397 PAMs, the quantified emission saving was only complete for approximately half the reported data. Interestingly, the completeness was higher for the expected emission savings in 2020 than 2010. The completeness varied significantly across the Member States). For the emission saving in 2020 specifically, eight Member States reported quantitative emission saving estimates for all their reported PAMs (Bulgaria, Cyprus, the Czech Republic, Greece, Ireland, Italy, Malta and the United Kingdom). Romania and Poland did not quantify 100% and 95% of their emission savings for 2020 respectively. Information regarding the number of Member States that provided a quantified emission saving for each sector is can be found in the sector specific sections.

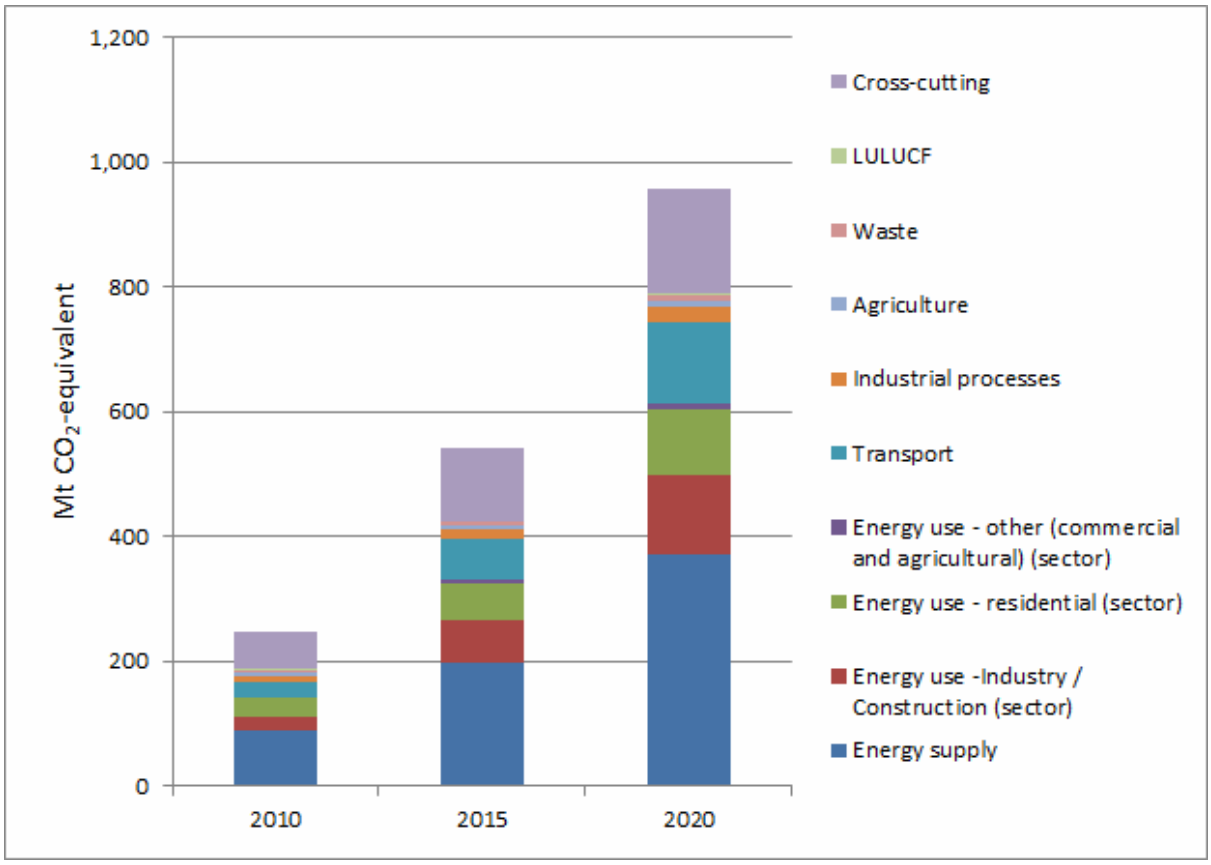
The lack of completeness in reporting is likely to result in the underestimation of total savings at the EU level. Furthermore, there is currently no common EU-wide methodology to estimate the ex-ante emission savings. The differences in national methodologies will affect the comparability of national estimates for emission savings delivered in response to the same CCPM and the accuracy of the total EU level estimate.

3.3 Total emission savings (all sectors)

3.3.1 Emissions savings by sector

A synthesis of the reported emission savings by sector is presented in this section. Across all years, the largest emission savings from the reported PAMs occur in the energy supply sector, followed by the cross-cutting sector[2]. The share of emission savings by sector shifts slightly between 2010 and 2020. Higher proportion of the savings result in the energy supply (36% to 39%), energy use – industry (8.8% to 13%) and the transport sector (9.4% to 14%) in 2020 compared with 2010. In turn, the share held by industrial processes (3.8% to 2.5%), agriculture (2.1% to 1.0%), waste (1.9% to 1.2%), LULUCF (1.6% to 0.3%) and cross-cutting sectors fall (24% to 27%). Detailed analysis of the specific PAMs contributing to the largest emission savings in each sector can be found in sections **Error! Reference source not found.** to 3.11.

Figure 3-1 Emission savings by sector



Source: ETC/ACM 2011
Note: Where a sector has been linked to more than one sector, the associated emission saving has been attributed to the cross-cutting sector.

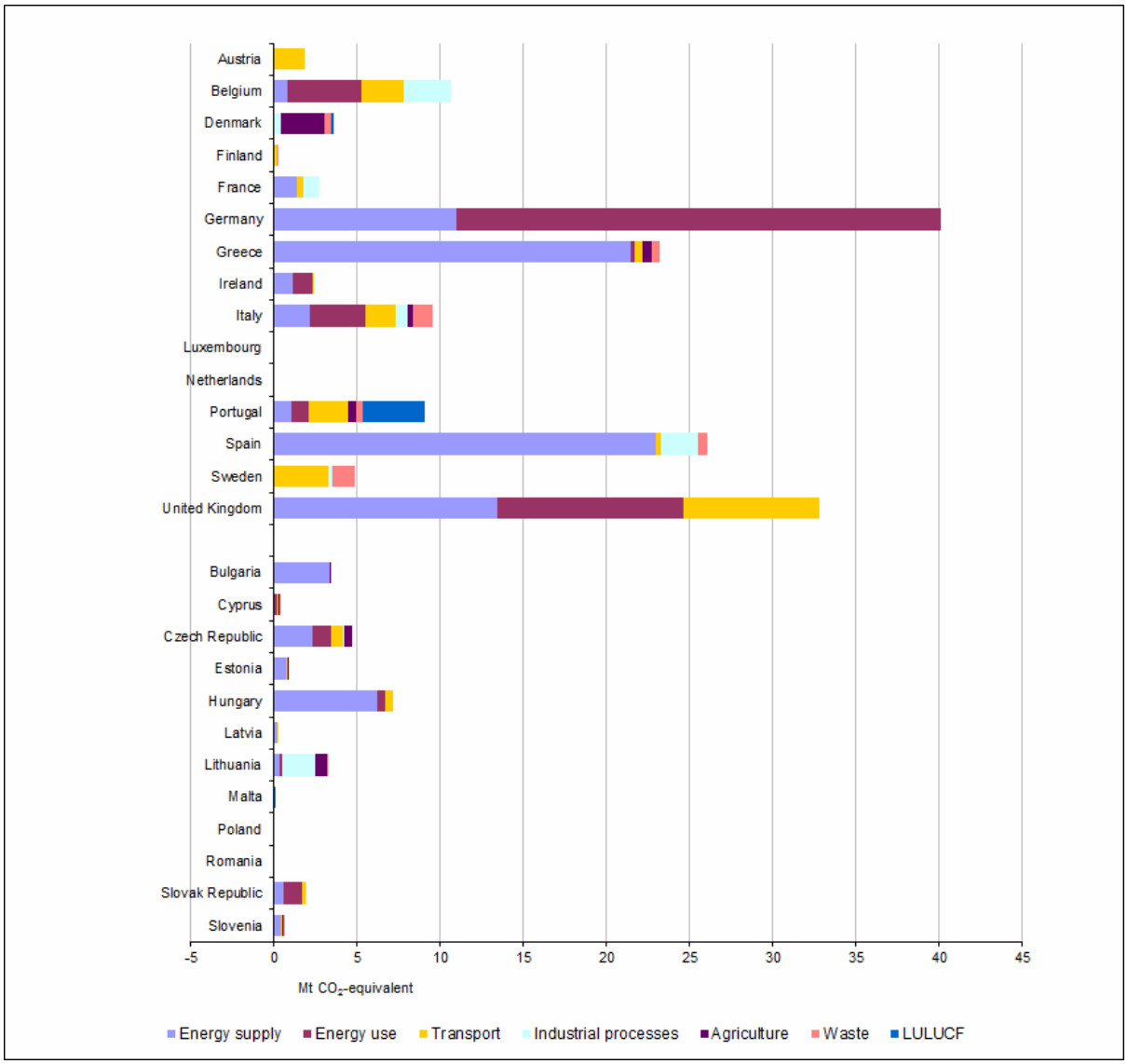
3.3.2 Emission savings by Member State

The emission savings by Member State mirror the relative proportions Member States account for in the EU-27 historic inventory. Member States with high emissions have a much higher absolute

[2] In Chapter 3, emission savings from the cross-cutting sector denotes the savings from those PAMs which have been linked to more than one sector. This is to avoid double counting of emission savings.

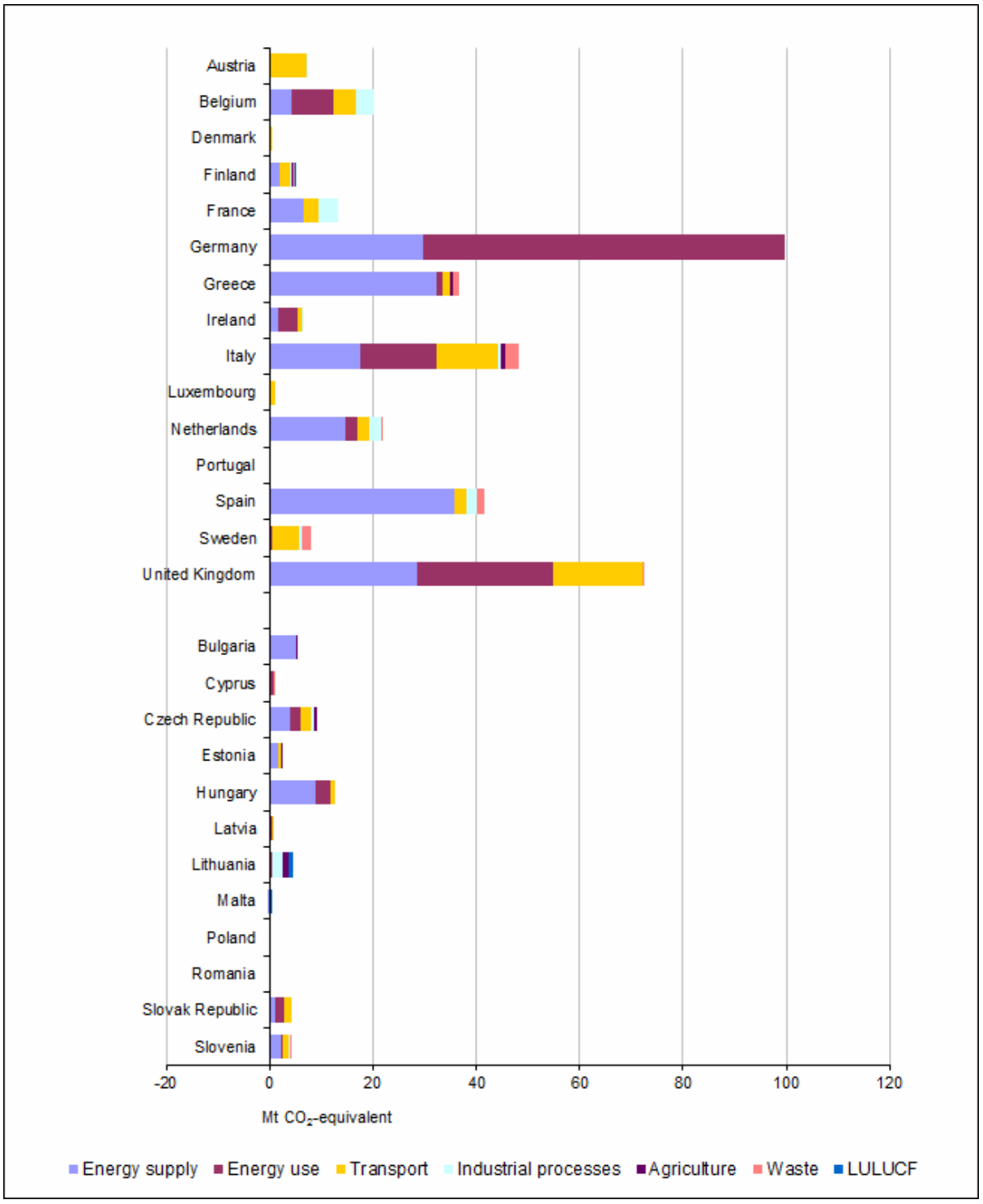
emission reduction potential because the policy will can affect more sources and sources with high emissions (c.f Figure 3-2, Figure 3-3 and Figure 3-4). In 2010, emission savings are highest in Germany, the United Kingdom and Spain in the EU-27 (first, second and 6th largest emitters in the EU-27 in 2009). In 2015 and 2020, emission savings are highest in Germany, the United Kingdom and Spain in the EU-27 (first, second and 4th largest emitters in the EU-27 in 2009).

Figure 3-2 Member States' estimates for emission savings in 2010



Source: ETC/ACM 2011
Note: Where a sector has been linked to more than one sector, the associated emission saving has been attributed to the cross-cutting sector. For Denmark, Germany and Portugal the 2009 submission was used as they did not submit in 2011. The QA/QC procedure was not implemented for these Member States.

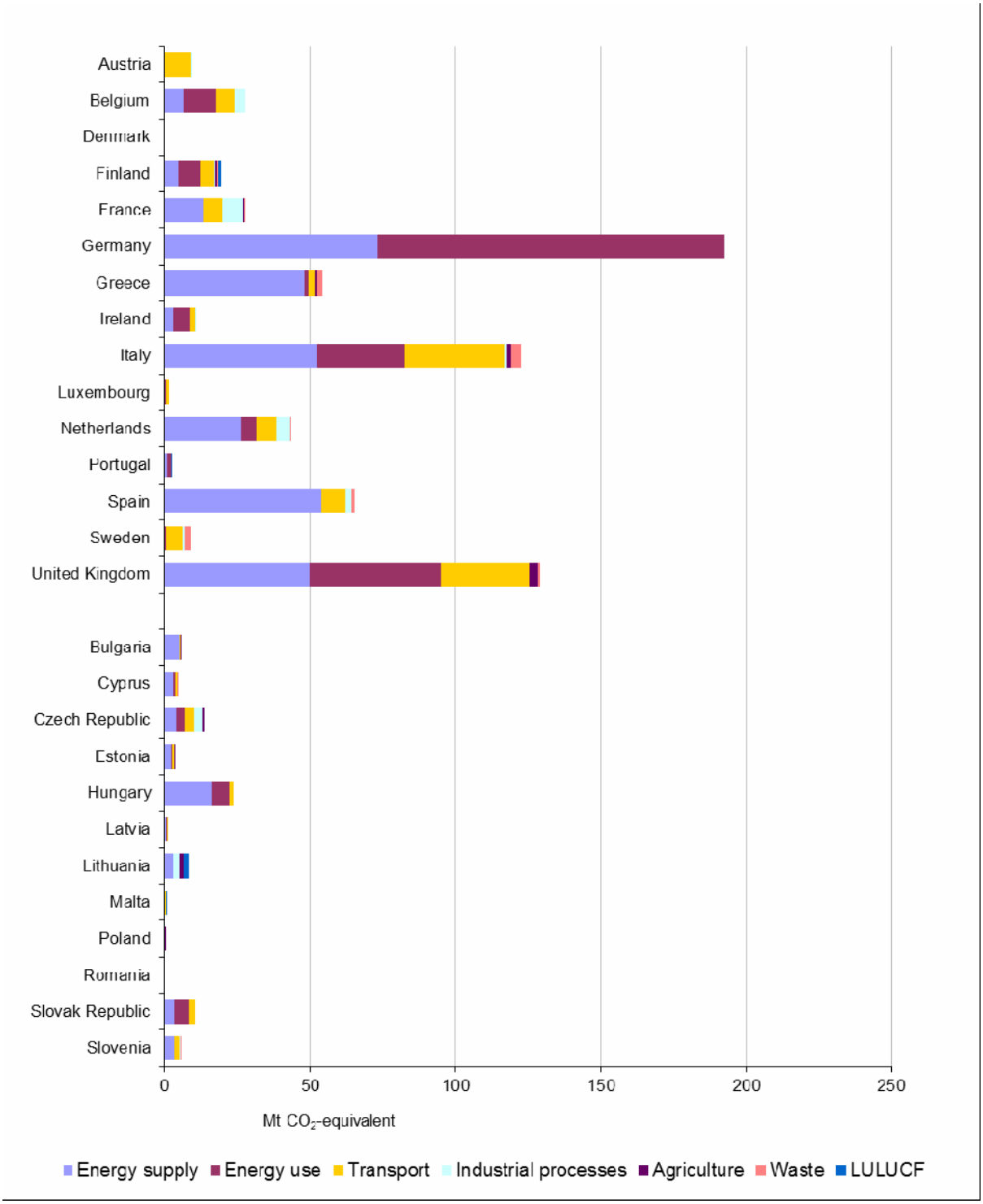
Figure 3-3 Member States' estimates for emission savings in 2015



Source: ETC/ACM 2011

Note: Where a sector has been linked to more than one sector, the associated emission saving has been attributed to the cross-cutting sector. For Denmark, Germany and Portugal the 2009 submission was used as they did not submit in 2011. The QA/QC procedure was not implemented for these Member States.

Figure 3-4 Member States' estimates for emission savings in 2020



Source: ETC/ACM 2011

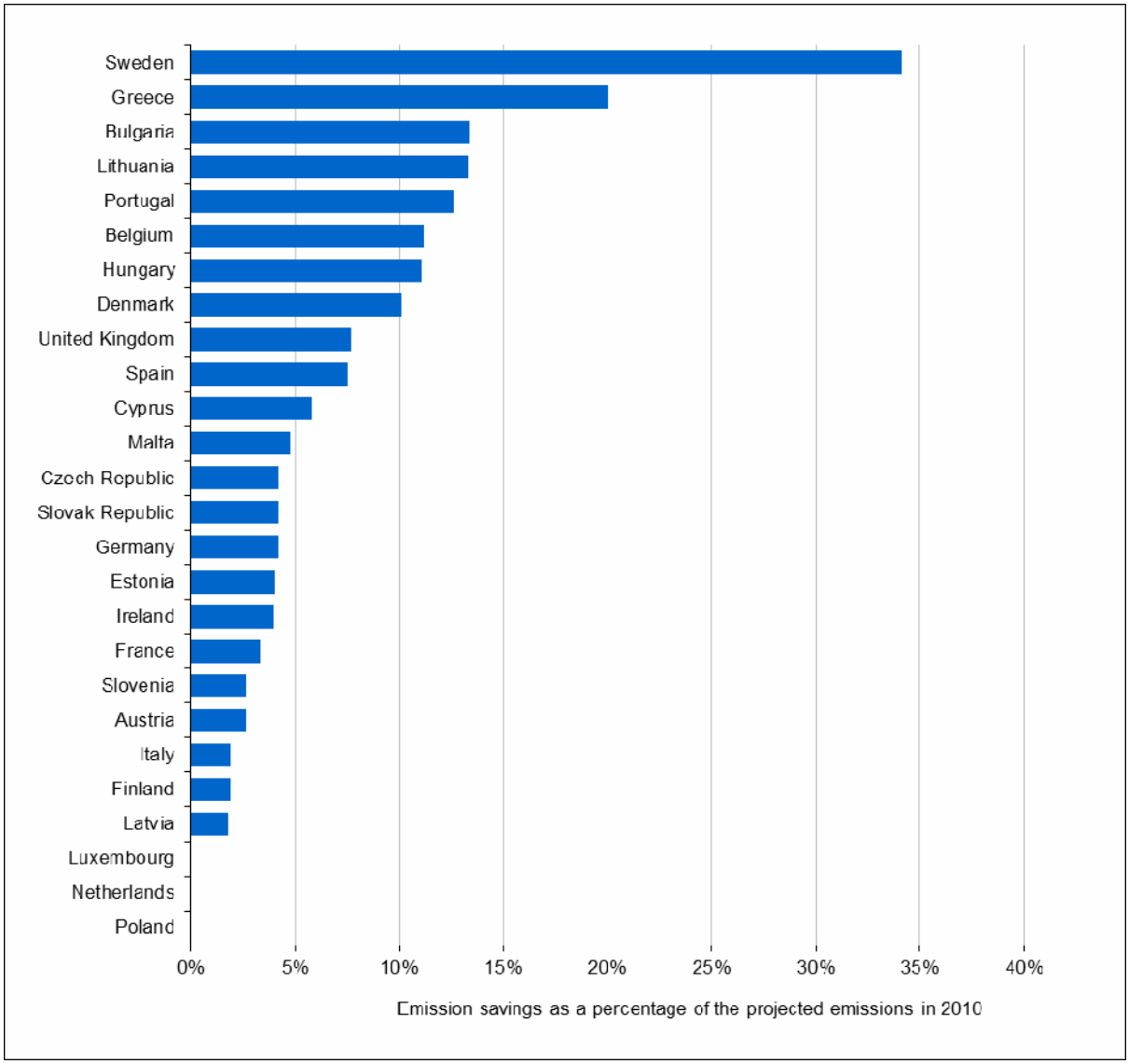
Note: Where a sector has been linked to more than one sector, the associated emission saving has been attributed to the cross-cutting sector. For Denmark, Germany and Portugal the 2009 submission was used as they did not submit in 2011. The QA/QC procedure was not implemented for these Member States.

3.3.3 Emission reduction from PAMs as a percentage of the reported projections

By dividing the emission savings by the projected emissions submitted alongside the PAMs information, under Article 3.2 (b) of the MM Decision, it is possible to determine the Member States with high emission savings from PAMs irrespective of their absolute emission levels. The reported projections are presented in the 'Greenhouse gas emission trends and projections in Europe 2011, Tracking progress towards Kyoto and 2020 targets' report (EEA, 2011d).

The top three Member States with emission savings accounting for the highest proportion of WEM projections in 2010 are Sweden, Greece and Bulgaria (34%, 20% and 13%). Emission savings reported by Latvia, Finland and Italy account for the least (below 2%). In 2020, Greece, Cyprus and Sweden are the three Member States that have the highest emission savings relative to their projected emissions (over 40%) and Portugal, Latvia and Denmark's expected savings account for the least. As previously mentioned, there is no common methodology to be used by the Member States to estimate the reported emission savings. Therefore, it is important that high emission savings accounting for a large proportion of the projected emissions are interpreted with this in mind.

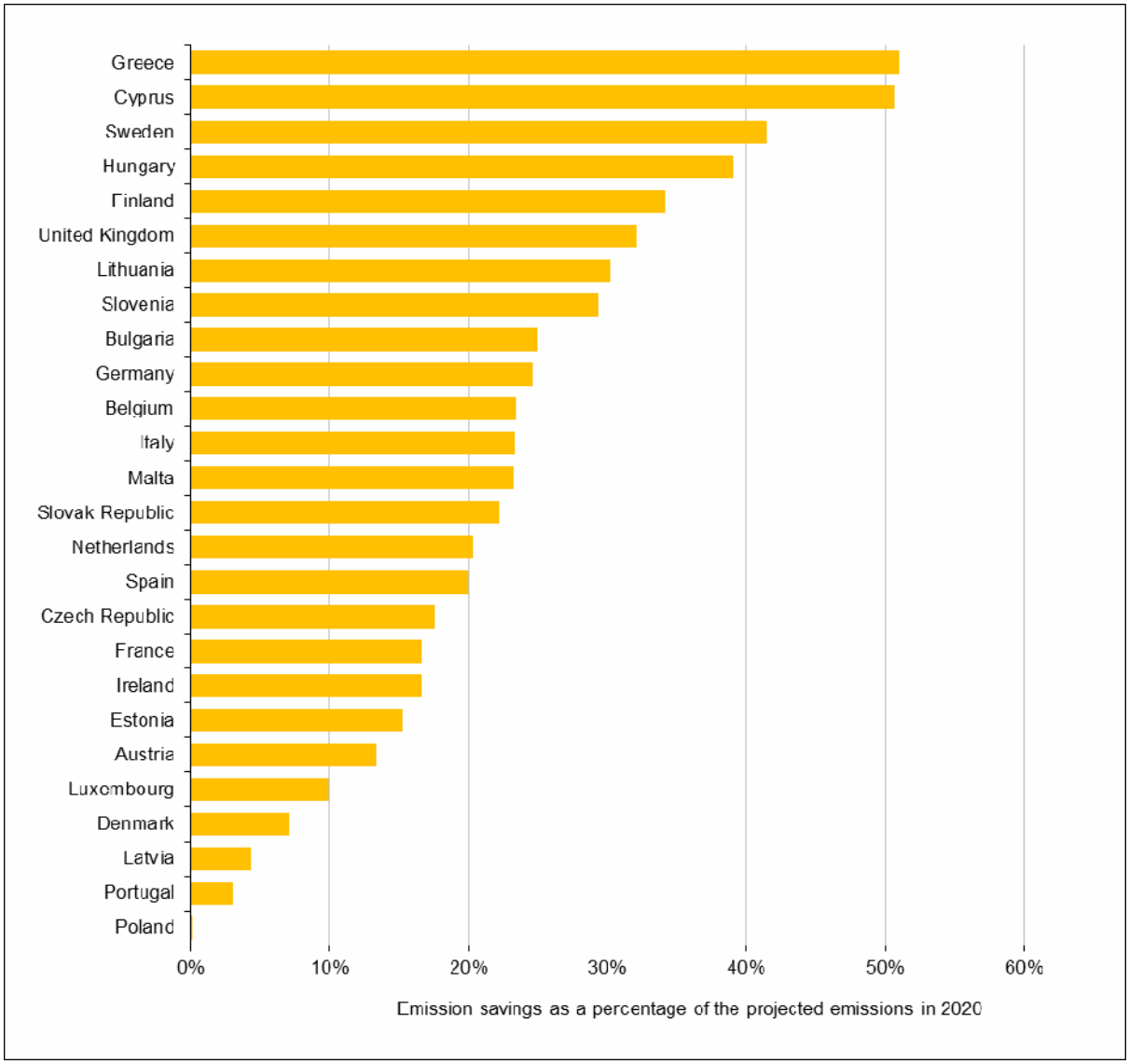
Figure 3-5 Member States' estimates for emission savings (EM + AM) in 2010 as a percentage of their projected WEM emissions in 2010



Source: ETC/ACM 2011

Note: PRIMES/ GAINS projections were used rather than the national projections for Bulgaria, Portugal and Romania because the QA/QC procedure implemented on the reported projections indicated a high risk of high uncertainty in the reported projections. See report 'Assessment of the Member States' projections submitted under the EU Monitoring Mechanism in 2011' (EEA, 2012).

Figure 3-6 Member States' estimates for emission savings in 2020 as a percentage of their projected emissions in 2020



Source: ETC/ACM 2011
Note: PRIMES/ GAINS projections were used rather than the national projections for Bulgaria, Portugal and Romania because the QA/QC procedure implemented on the reported projections indicated a high risk of high uncertainty in the reported projections. See report 'Assessment of the Member States' projections submitted under the EU Monitoring Mechanism in 2011' (EEA, 2012).

3.4 Energy supply

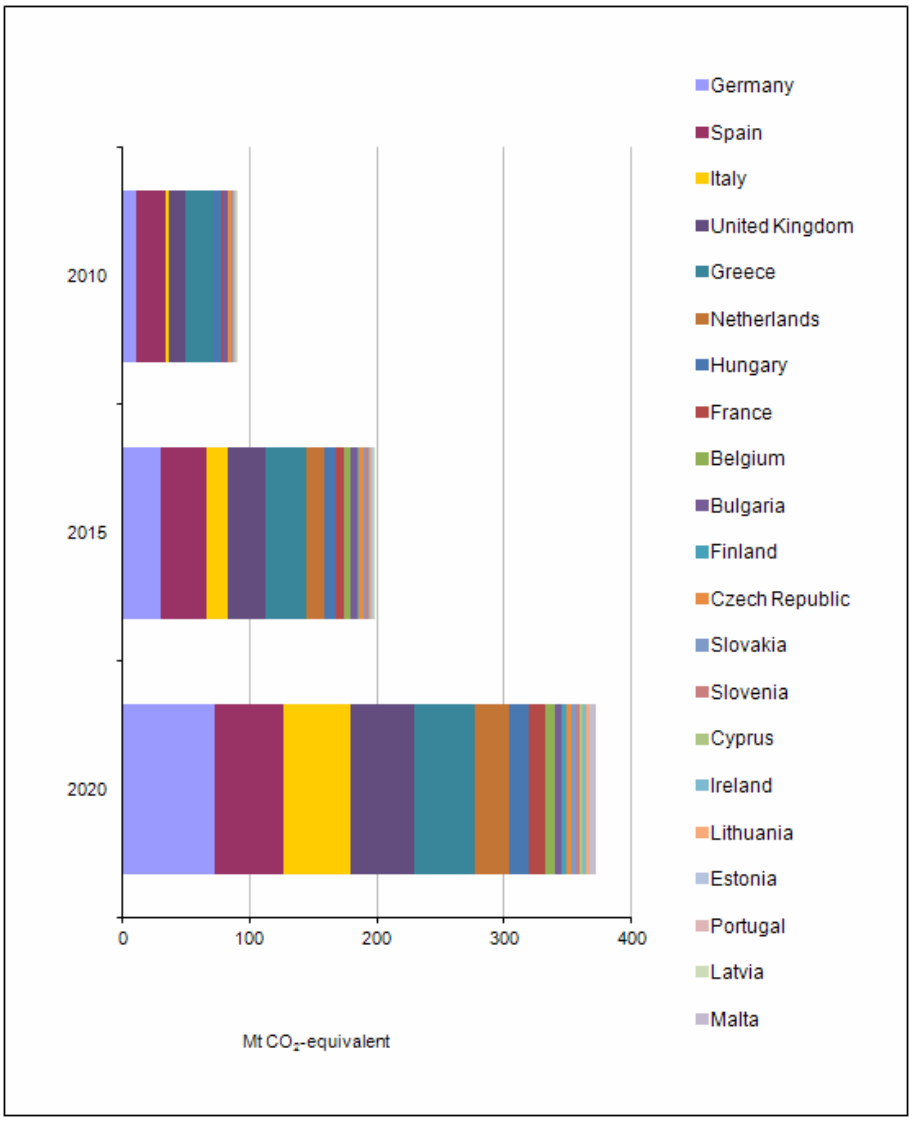
3.4.1 All PAMs

In EU-27, the energy supply sector has the largest quantified emission savings. Many Member States (both EU-15 and EU-12) expect large savings to come from energy supply and 22 Member States provided quantified estimates for the sector.

Figure 3-1 shows the emission savings estimated by Member States in the Energy supply sector for 2010, 2015 and 2020. The total emission savings are estimated at 90 Mt CO_2-equivalent (2010), 197 Mt CO_2-equivalent (2015) and 371 Mt CO_2-equivalent (2020). Overall for this sector, the largest emission

savings are expected to come from policies implemented in Germany, Spain, Greece, the United Kingdom and Italy.

Figure 3-7 Member States' estimates for emission savings in the Energy supply sector



Source: ETC/ACM 2011

In some cases, the large total expected emission savings come from the aggregation of numerous policies each delivering smaller emission savings, such as Italy with five quantified policies. However, there are cases where the large expected emission savings come from a few key policies, which are expected to be very influential. For each year, key policies have been identified below with the associated quantitative emission saving:

In 2010, the largest savings in energy supply were delivered from:

- Spain's promotion of generation from wind energy (13 Mt CO_2-equivalent) linked to the RES-E Directive, the RES Directive, the European Energy programme for Recovery regulation and the Taxation of energy products and electricity Directive;

- Greece's electricity production from renewable energy sources (10 Mt CO_2-equivalent) linked to the RES-E Directive and the RES Directive, and the decommissioning of old inefficient power units (11 Mt CO_2-equivalent) linked to the Internal market in natural gas Directive – Greece's expected policy savings are particularly ambitious considering the relatively small emission levels from the country and correspondingly low absolute emission levels (11th highest in the EU-27 in 2011);

- The UK's Renewables Obligation (10 Mt CO_2-equivalent) linked to the RES-E Directive.

The largest savings in emissions from the energy supply sector in 2015 are expected from the same key policies. Spain's policy promotion of generation from wind energy is expected to deliver 18 Mt CO_2-equivalent; Greece's electricity production from renewable energy sources and decommissioning of old inefficient power units is expected to deliver 14 Mt CO_2-equivalent and 16 Mt CO_2-equivalent, respectively; and the UK's Renewables Obligation is expected to deliver 15 Mt CO_2-equivalent.

By 2020, the largest savings in the energy supply sector are expected to be delivered through Germany's Renewable Energy Act, which is also linked to the RES-E Directive and expected to deliver 36 Mt CO_2-equivalent. The UK's additional renewables in generation (Renewable Energy Strategy) becomes a key policy in 2020 and is estimated to deliver savings of 24 Mt CO_2-equivalent. The previously mentioned key policies continue to deliver large savings. Spain's policy promotion of generation from wind energy (27 Mt CO_2-equivalent) and Greece's decommissioning of old inefficient power units (26 Mt CO_2-equivalent) remain notably high.

3.4.2 CCPM-related PAMs

The majority (more than 88%) of quantified policies in the energy supply sector are CCPM-related PAMs. In 2010, the only non-CCPM national policy to appear in the top eight quantified measures was Germany's change of power plant dispatch, where there has been a decrease in the CO_2 emissions emitted during the operation of fossil fuel fired power plants with savings of approximately 3 Mt CO_2-equivalent. In 2015 and 2020, the top eight policies expected to deliver the largest emission savings are all CCPM-related.

The most influential CCPMs for the energy supply sector were the RES-E Directive, the RES Directive and the promotion of cogeneration Directive. These CCPMs had the most quantified emission savings linked to them. The Internal market in natural gas Directive was influential but mainly because Greece's key policy for decommission old inefficient power units was linked to it.

3.4.3 Comparison with European Commission policy estimates

This section compares the quantified policy impacts reported by Member States for national policies linked to CCPMs to the European Commission estimates of the impacts of these CCPMs (EC, 2011). Whilst these estimates will not be directly comparable, due to difference in methodology, assumptions and model, it is nevertheless interesting to explore the relative scales of the projected savings. The emission savings expected by the European Commission tend to be higher than the estimates reported by Member States. This is primarily due to incompleteness of reporting in the Member State submissions (some Member States have linked a national policy to a CCPM but have not quantified emission savings and others have not linked to the CCPM at all).

In most cases, Member States implement PAMs to meet the requirements of several CCPMs, as reflected by the fact that many policies are linked to more than one CCPM. In this section, emission savings from policies reported by the Member States are attributed to the first CCPM, this makes the assumption that Member States would link the national policy first to its most influential CCPM. This methodology has been used to avoid double counting within the same sector, thus enabling all savings to be considered additional when discussing a second CCPM affecting the same sector. If the emission savings are large and there are second, third or fourth linkages to the CCPM, then these emission savings have been noted.

In the energy supply sector, the Commission predicts that the largest emission reductions will be achieved through the RES Directive in 2020 and this has been quantified as a potential somewhere in the range of 600-900 Mt CO_2-equivalent as shown in Table 3-1.

Table 3-1 Emission reduction potentials of the EU policies in EU-15 and EU-27 Member States in 2010 and 2020, as estimated by the European Commission – Energy supply

Policies and measures	Emission reduction potential by 2010 in EU-15 (Mt CO_2-eq.)	Emission reduction potential by 2020 in EU-27 (Mt CO_2-eq.)	Stage of implementation /timetable /comments
Promotion of electricity from RES-E (2001)	100-125		In force
(New) Renewable energy Directive (Directive 2009/28/EC)		600-900	In force
CCS Directive	n/a	0.875	In force
Directive on promotion of cogeneration	65		In force
Further measures on renewable heat (including biomass action plan)	36-48		Biomass Action Plan, Dec 2005, over 20 further actions planned. Renewable heat included in proposed new Directive on renewable energy
Developing the internal energy market	80-120		Amendments to a number of directives 28 to continue to help complete the internal energy market.
TOTAL in implementation	**282-358**	**601-901**	

Source: EC, 2011

In Member States' submissions, this directive frequently came out as one of the most influential CCPMs with large quantified emission savings linked to the RES-E Directive and RES Directive in 2010, 2015 and 2020. However, despite this, the anticipated savings for the RES-E Directive and RES Directive are currently much lower in the submissions. For 2020, the Member States' total expected emission savings for the RES-E directive and the RES Directive are 157 Mt CO_2-equivalent (EU-27)

and 133 Mt CO_2-equivalent (EU-27), respectively. This means that only 48% of the Commission's lowest estimate will be delivered if Member States achieve all the savings quantified from renewable energy sources in their submissions.

One reason for the lower estimate could be underreporting, but this does not appear to be the case. All 27 Member States link at least one PAM to either the RES Directive or the RES-E Directive, of these only three Member States (Denmark, Romania and Slovakia) have provided no estimate or a zero estimate for these linked PAMs. Spain, UK, Germany and Italy expect the largest savings of 51 Mt CO_2-equivalent, 51 Mt CO_2-equivalent, 47 Mt CO_2-equivalent and 44 Mt CO_2-equivalent, respectively, in 2020.

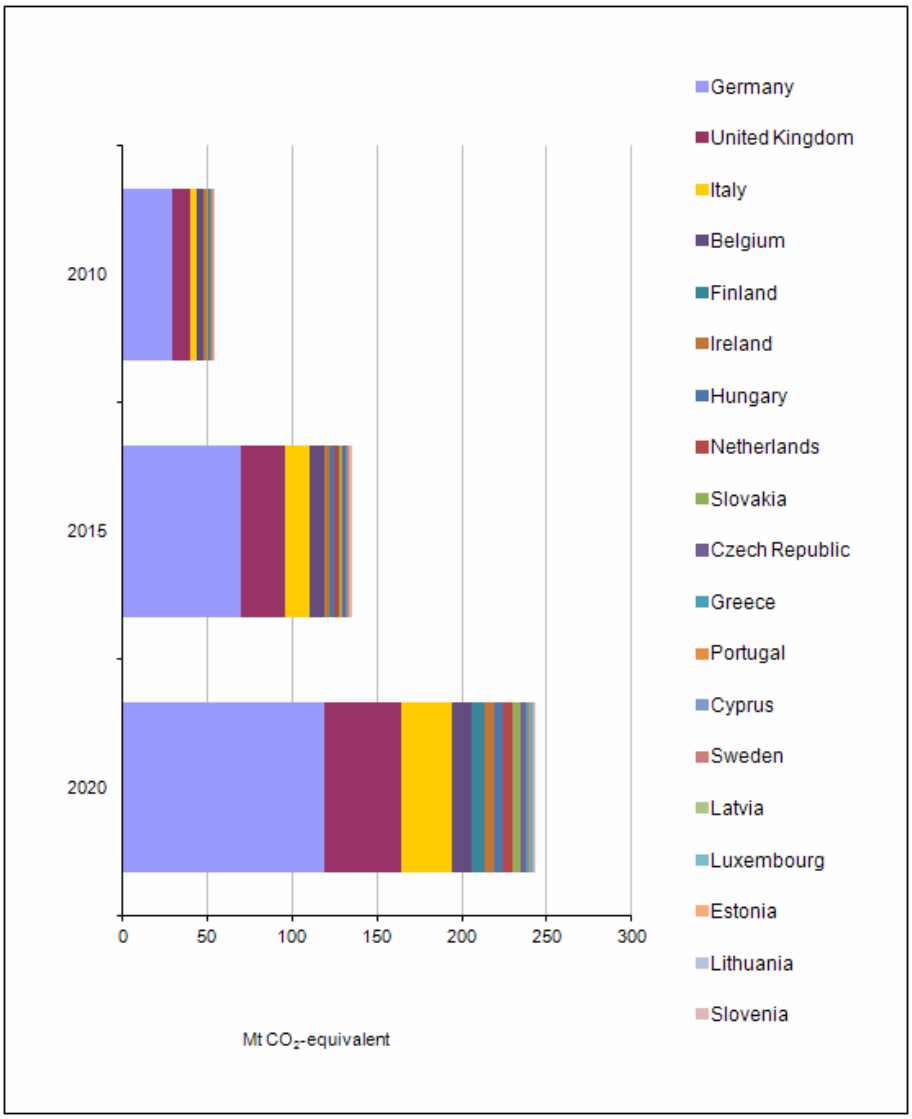
For 2010, the Commission predicted that high emission reductions should have been achieved in EU-15 through the promotion of cogeneration Directive (~65 Mt CO_2-equivalent) and developing the internal energy market (80-120 Mt CO_2-equivalent) as shown in Table 3-1. Again, the Member State submissions for EU-15 are significantly lower this time due to under reporting. From the submissions 4 Member States quantified emission savings for the promotion of cogeneration Directive, totalling 2 Mt CO_2-equivalent. 2 Member States quantified emission savings for the Internal market in natural gas Directive at 12 Mt CO_2-equivalent and 1 Member State quantified emission savings for the Internal electricity market Directive at just under 0.5 Mt CO_2-equivalent.

3.5 Energy use

3.5.1 All PAMs

Emissions savings from the energy end-use sector are strongly influenced by the estimates of policy impacts in Germany, the United Kingdom and Italy. Figure 3-8 shows the emission savings estimated by Member States in the energy use sector for 2010, 2015 and 2020. The total emission savings are estimated at 53 Mt CO_2-equivalent (2010), 134 Mt CO_2-equivalent (2015) and 243 Mt CO_2-equivalent (2020). 20 Member States provided quantified estimates for the sector.

Figure 3-8 Member States' estimates for emission savings in the Energy use sector



Source: ETC/ACM 2011

The key policies underpinning the savings shown in Figure 3-8 have been identified below highlighting the associated quantified emission savings. In 2010, the largest savings in energy use were delivered from:

- Electricity conservation in Germany with savings of 12 Mt CO_2-equivalent expected to be delivered;
- In the UK, the 2008-2011 Carbon Emissions Reduction Target (CERT) target (4 Mt CO_2-equivalent) and the Building Regulations 2002, 2006 and 2010 (4 Mt CO_2-equivalent) made large contributions;
- In Belgium, financial support for Rational Use of Energy (RUE) and Renewable Energy Sources (RES) in the residential sector delivered 4 Mt CO_2-equivalent.

In 2015, the expected contributions of these key policies increase. In Germany large savings are still expected from electricity conservation, which is likely to deliver approximately 35 Mt CO_2-equivalent. In the UK, the Building Regulations 2002, 2006 and 2010 are increasingly important and are expected to deliver 6 Mt CO_2-equivalent. In addition, the 2008-2011 Carbon Emissions Reduction Target (CERT) obligation is expected to deliver 5 Mt CO_2-equivalent. In Belgium, financial support to Rational Use of Energy (RUE) and Renewable Energy Sources (RES) in the residential sector is expected to deliver 7 Mt CO_2-equivalent. Italy is expected to make large contribution by 2015. It has 10 quantified measures in 2015. Italy's National Action Plan for renewable energy is expected to deliver 8 Mt CO_2-equivalent. Green Certificates to increase the electricity generation from renewables are expected to deliver 4 Mt CO_2-equivalent and White certificates (covering 2012-2016) supporting energy savings in energy use from CHP are expected to deliver 1 Mt CO_2-equivalent.

By 2020, emissions savings from the energy use sector are largely due to the estimates of Germany, UK, and Italy.

In Germany large savings are still expected from electricity conservation (52 Mt CO_2-equivalent). However, emission savings from this policy should in fact be attributed to the energy supply sector (because sectors relate to GHG Inventory sectors as reported to the UNFCCC). This example shows the need for clearer guidance to be provided to the Member States. Note that the QA/ QC procedure was not performed on Germany's submission and thus the policy was allocated to the energy use sector at the time this report was written[3]. Shifting this policy from the energy use to the energy supply sector will change the emission savings in the two sectors significantly because of the high emission savings expected from this policy.

In the UK, the Renewable Heat Incentive is expected to deliver 17 Mt CO_2-equivalent. In Italy, there are a number of policies targeting this sector including the new building efficiency standards (5 Mt CO_2-equivalent) and the Action Plan July 2007 covering 2012-2016 (white certificates) extended to 2020 (4 Mt CO_2-equivalent). In Belgium, financial support to RUE and RES in the residential sector is expected to deliver 11Mt CO_2-equivalent.

3.5.2 CCPM-related PAMs

In 2010, over half of policies with quantified savings in the energy use sector are attributed to national PAMs. However, in 2020 over half of savings are attributed to CCPM-related PAMs. Note that there is variation within the energy use subsectors with quantified policies; Industrial energy use has the highest proportion of savings due to national PAMs but emission savings due to CCPM-related PAMs is projected to increase (from 17% in 2010 to 38% in 2020). In the residential energy use sector the importance of national measures is low but increases over the period to 2020 (CCPM-related PAMs represent 99% of emission savings in 2010 but drop to 88% by 2020).

The most influential CCPMs for the energy use sector were the end-use and energy services Directive and the energy performance of buildings Directive. These CCPMs had the most quantified emission savings linked to them.

[3] Consequently revised in the data to be uploaded to the Policies and Measures Database on the EEA website, http://www.eea.europa.eu/themes/climate/pam

3.5.3 Comparison with European Commission policy estimates

In the energy use sector, the Commission predicted that large savings should have been achieved in 2010 from the EU-15 implementation of the energy end use efficiency and energy services Directive with an expected emission reduction potential of approximately 92 Mt CO_2-equivalent, as shown in Table 3-2.

Table 3-2 Emission reduction potentials of the EU policies in EU-15 and EU-27 Member States in 2010 and 2020, as estimated by the European Commission – Energy use

Policies and measures	Emission reduction potential by 2010 in EU-15 (Mt CO_2-eq.)	Emission reduction potential by 2020 in EU-27 (Mt CO_2-eq.)	Stage of implementation / timetable /comments
Directive on the energy performance of buildings	20		In force
			Monitoring and review
Directive on the energy performance of buildings (recast)		190-290	Adopted on 18 May 2010
Directive on ecodesign requirements for energy related products Directive on labelling of the consumption of energy and other resources by energy-related products		170	9 implementing measures adopted on ecodesign and 8 on energy labelling. To be revised or complemented by further measures.
Regulation on the labelling of tyres with respect to fuel efficiency and other essential parameters		6-16	
Regulation on energy efficiency labelling programme for office equipment (Energy Star)		11.2 (2009-2014)	
Directive on energy end use efficiency and energy services	92		In force; National Energy Efficiency Action Plans adopted in all EU-27.
Intelligent Energy for Europe programme / Covenant of Mayors	n/a	132	Programme for policy support in energy efficiency
Programme for voluntary action on motors (Motor Challenge)	30		Supporting programme for voluntary action on efficient motor systems
Public procurement	25-40		EU Handbook developed for guidance for increased energy efficient public procurement
TOTAL in implementation	**193-208**	**509-619**	

Source: EC, 2011

Member States' submissions are consistent in that the Directive is frequently reported as one of the most important CCPMs. However, the anticipated savings are significantly lower at 19 Mt CO_2-equivalent (EU-15) for 2010. The highest savings are reported for UK at 10 Mt CO_2-equivalent, Belgium at 4 Mt CO_2-equivalent for the first linked policy (and 4 Mt CO_2-equivalent for a second linked policy but this is not included in the 19 Mt CO_2-equivalent) and France at 3 Mt CO_2-equivalent. Ireland, Italy, Greece and Portugal also quantified savings from policies linked to the Directive in 2010. Austria, Denmark, Spain, Finland and the Netherlands have not quantified emission savings, but have linked a PAM to this Directive.

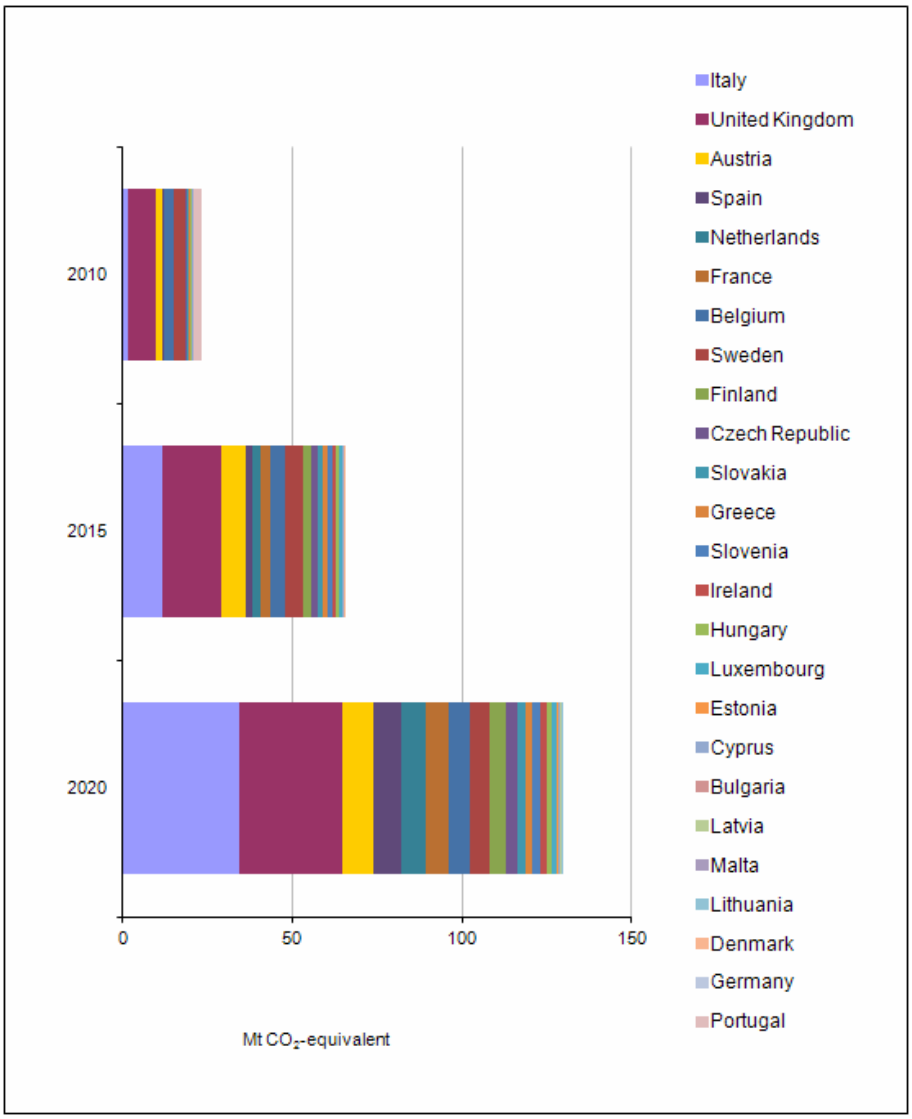
In 2020, the Commission expects that the energy performance of buildings Directive and its recast will deliver the largest savings for the sector, approximately 190-290 Mt CO_2-equivalent (EU-27) as shown in Table 3-2. EU-27 Member States also report large expected savings from policies linked to the Directive in 2020 in their submissions and the anticipated savings are 59 Mt CO_2-equivalent. Highest expected savings are reported for Germany at 15 Mt CO_2-equivalent; the UK at 14 Mt CO_2-equivalent; Greece at 7 Mt CO_2-equivalent and Italy at 5 Mt CO_2-equivalent. 19 of 24 Member States quantify the emission savings from policies linked to the Directive. Those 5 Member States where a policy is listed, but there is no quantitative estimate include Sweden, Poland, Latvia, Spain and Denmark. Bulgaria, Malta and Romania do not link a PAM to the Directive (Malta links as a second CCPM but again emission savings are not quantified). All the remaining Member States provide some quantitative estimates for PAMs linked to the Directive. This is one of the most quantified CCPMs (and the estimated have been reported by most of the high emitting Member States) and so the shortfall might not simply result from a lack of quantitative information, although there might still be gaps in reporting estimates for all policies linked to the Directive.

3.6 Transport

3.6.1 All PAMs

Figure 3-9 shows the emission savings estimated by Member States in the transport sector for 2010, 2015 and 2020. The total emission savings are estimated at 23 Mt CO_2-equivalent (2010), 66 Mt CO_2-equivalent (2015) and 129 Mt CO_2-equivalent (2020). The largest policy contributions originate from Italy, the UK and Austria. 24 Member States provide quantified emission savings for the transport sector, which is higher than in the energy supply and energy use sectors.

Figure 3-9 Member States' estimates for emission savings in the Transport sector



Source: ETC/ACM 2011

In general, the reported total emission reduction was low in 2010 (only 23 Mt CO_2-equivalent) from all quantified transport policies and measures. This is much lower than what one might expect given awareness of the increasing trends in GHG emissions from the transport sector and Member States aims to achieve the 9% indicative energy savings target by 2016 (as required by the Energy End Use Efficiency and Energy Services Directive). The low expected emission savings were due to the large number of policies that were quantified but expected to achieve relatively low savings in 2010 compared to the energy supply and energy use sector.

The key policies underpinning the savings shown in Figure 3-9 have been identified highlighting the associated quantified emission savings. In 2010, the largest savings in the transport sector were delivered from the implementation of the EU level voluntary agreements for CO_2 from cars in the UK (5 Mt CO_2-equivalent). Across all Member States' submissions very few savings are quantified with respect to this and related CCPMs (five Member State link a policy to this as the first CCPM and only

a couple link as the second, third or fourth EU policy). There is under reporting of this CCPM in the submissions.

In 2015, the transport sector is the third most important sector (excluding cross-cutting) although there are still a number of reported policies that lack quantitative estimates of the projected savings. The UK's reported savings from EU level voluntary agreements continue to be the single largest policy saving at 8 Mt CO_2-equivalent. In addition, the UK's renewable transport fuel obligation is expected to deliver 5 Mt CO_2-equivalent. In Italy, the emission standard for new cars is expected to deliver large savings of 5 Mt CO_2-equivalent and infrastructural measures are expected to deliver 4 Mt CO_2-equivalent.

There are also a number of reported policies with low quantitative estimates for 2020. Italy is the Member State expecting the largest savings; the emission standard for new cars is expected to deliver large savings of 10 Mt CO_2-equivalent and in addition some of the other transport measures set out in Italy's National Action Plan, such as electric vehicles and reducing the demand for petrol and diesel whilst promoting faster fleet update of cars and light commercial vehicles, are all expected to deliver savings of 10 Mt CO_2-equivalent. In the UK, expected savings from EU level voluntary agreements in 2020 are nearly 8 Mt CO_2-equivalent and enhanced targets set for suppliers of diesel and motor spirit are expected to deliver savings of 6 Mt CO_2-equivalent.

3.6.2 CCPM-related PAMs

In 2010 emission savings for national policies with quantified savings in the transport sector were fewer than 6% of all savings. National measures are more important by 2020 but represent less than about 26% of quantified savings.

In 2010, the most influential CCPMs were the Biofuels Directive (13 Member States reporting quantified emission savings linked to this CCPM) and the voluntary agreements with car manufacturers (five Member States reporting quantified emission savings linked to this CCPM). The strategy for cars CO_2 is expected to be influential by 2020 and the savings are greater than those from the Biofuels Directive because of the large savings expected in Italy.

3.6.3 Comparison with EU wide policy estimates

In the transport sector, the Commission predicted that the Community strategy on CO_2 from passenger cars (including voluntary commitment (VC) of car manufacturers' associations) should have delivered potential savings in the range of 107-115 Mt CO_2-equivalent and voluntary agreements with European, Japanese and Korean car manufacturers should have delivered an additional 75-80 Mt CO_2-equivalent in 2010, as shown in Table 3-3.

Table 3-3 Emission reduction potentials of the EU policies in EU-15 and EU-27 Member States in 2010 and 2020, as estimated by the European Commission – Transport

Policies and measures	Emission reduction potential by 2010 in EU-15 (Mt CO_2-eq.)	Emission reduction potential by 2020 in EU-27 (Mt CO_2-eq.)	Stage of implementation / timetable / comments
Community strategy on CO_2 from passenger cars (including voluntary commitment (VC) of car manufacturers' associations)	107-115		VC: monitoring; review ongoing
			Labelling: in force
	Of which VC: 75-80	50	Communication on fiscal measures: in implementation
Fuel quality Directive		62.5	First implemented in 1998. Revisions adopted in December 2008
Directive on the promotion of transport bio-fuels	35-40		In force
Voluntary agreements with European, Japanese and Korean car manufacturers.	75-80		Implemented
Inclusion of Aviation in EU ETS		183	Adopted. Will include all flights from 1/01/2012
Public procurement of vehicles		1.9	
TOTAL in implementation	**217-237**	**297.4**	

Source: EC, 2011

By comparison according to the Member State's submissions, the voluntary agreements with car manufacturers to reduce specific CO_2 emissions (ACEA, KAMA, JAMA) were expected to have achieved 5 Mt CO_2-equivalent by the EU-15 in 2010. However, only the UK, Portugal, Austria, and Ireland (four Member States, EU-15) quantified emissions savings linked to this CCPM. France, Spain and Sweden linked a policy to the CCPM but did not quantify the emission savings and other Member States did not link a policy to this CCPM.

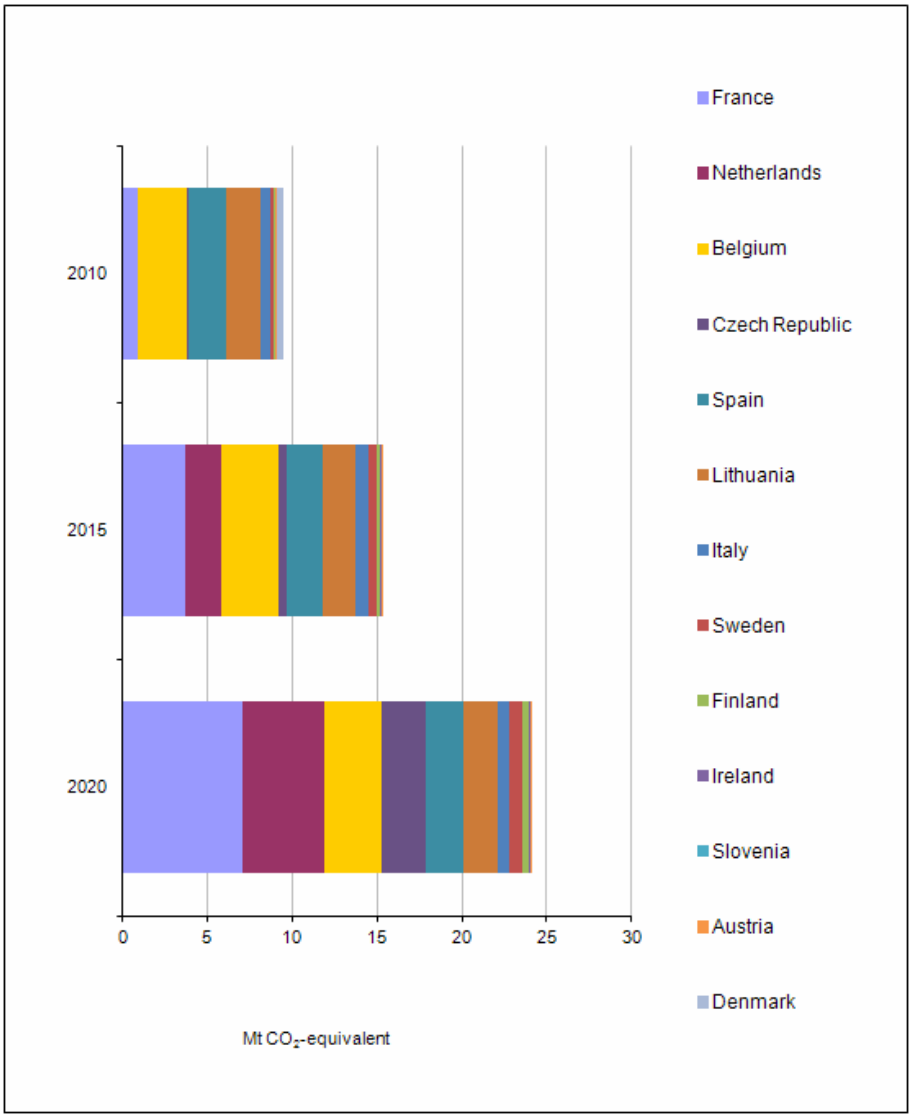
In 2010, the Commission predicted that the Directive on the promotion of transport biofuels should deliver 35-40 Mt CO_2-equivalent, as shown in Table 3-3. In Member State's submissions (EU-15 in 2010) the savings anticipated from the Biofuels Directive were lower at 14 Mt CO_2-equivalent. 8 Member States in EU-15 quantified emission savings from this CCPM. France has the highest estimated emission savings (5 Mt CO_2-equivalent), followed by the UK (3 Mt CO_2-equivalent) and Portugal (2 Mt CO_2-equivalent). Carbon savings were also quantified by Austria, Belgium, Germany, Greece and Italy. Luxembourg, the Netherlands and Spain linked a policy to this CCPM but did not quantify it. Overall, this policy was relatively well quantified in the EU-15.

3.7 Industrial processes

3.7.1 All PAMs

Emissions savings from the industrial sector are strongly influenced by the estimates of policy impacts in France, the Netherlands and Belgium. Figure 3-10 shows the emission savings estimated by Member States in the industrial sector for 2010, 2015 and 2020. The total emission savings are estimated at 10 Mt CO_2-equivalent (2010), 15 Mt CO_2-equivalent (2015) and 24 Mt CO_2-equivalent (2020). 13 Member States quantify emission savings in the industrial sector.

Figure 3-10 Member States' estimates for emission savings in the Industrial sector



Source: ETC/ACM 2011

The quantified emission savings from the industrial sector were low in 2010. The Member States contributing most to savings in the sector were Belgium, Spain and Lithuania. In 2010, the largest individual policy savings were expected to have been delivered from Belgium's emission reduction agreement with nitric acid producers (2.9 Mt CO_2-equivalent). This is a national policy not linked to CCPMs. This was followed by Spain's control and restrictions on the production and use of

fluorinated compounds, which was expected to have delivered 2.2 Mt CO_2-equivalent. This measure is linked to the F-gas regulation, the Effort Sharing Decision and the Waste electrical and electronic equipment Directive. Finally, Joint Implementation projects in Lithuania linked to the Kyoto Protocol project mechanisms were expected to have delivered 1.5 Mt CO_2-equivalent in 2010.

In 2015, the most significant policy savings are expected from France's limitation of emissions of fluorinated gases used as refrigerants at approximately 3.6 Mt CO_2-equivalent and linked to the F-gas regulation. Belgium's emission reduction agreement with nitric acid producers is still expected to deliver large savings of 3.4 Mt CO_2-equivalent by 2015. In the Netherlands, large expected emission savings are anticipated from the opt-in of N_2O from particular sources in the ETS. In 2020, these three policies are still the most significant quantified measures expected to deliver 6.5 Mt CO_2-equivalent (France), 4.8 Mt CO_2-equivalent (the Netherlands) and 3.4 Mt CO_2-equivalent (Belgium).

3.7.2 CCPM-related PAMs

The quantified savings from CCPM-related measures is almost 70% in 2010 and is projected to increase to over 85% by 2020. The most influential CCPM is the F-gas regulation; seven Member States quantify emission savings linked to this policy in 2010 and six Member States in 2020. In 2020, the EU ETS Directive and the Integrated Pollution Prevention and Control (IPPC) Directive are also influential.

3.7.3 Comparison with EU wide policy estimates

In 2010, the European Commission expected that the IPPC Directive would deliver emission reductions in the range of 60-70 Mt CO_2-equivalent (EU-15) – see Table 3-4. In the EU-15, only Italy quantified emissions savings from the Integrated Pollution Prevention and Control (IPPC) Directive with emission savings estimated at 0.7 Mt CO_2-equivalent and only three other Member States linked policies to this CCPM; Portugal, Spain and Sweden. The emission saving were slightly higher at 1.5 Mt CO_2-equivalent at the EU-27 level with reporting from four Member States.

In 2020, as shown in Table 3-4, the European Commission anticipates that emission savings from the F-gas regulation will be 46 Mt CO_2-equivalent. In the submissions, 13 Member States linked a policy to this CCPM. Six Member States quantified emission savings and the total expected emission savings were 10 Mt CO_2-equivalent.

Table 3-4 Emission reduction potentials of the EU policies in EU-15 and EU-27 Member States in 2010 and 2020, as estimated by the European Commission – Industrial processes

Policies and measures	Emission reduction potential by 2010 in EU-15 (Mt CO_2-eq.)	Emission reduction potential by 2020 in EU-27 (Mt CO_2-eq.)	Stage of implementation / timetable / comments
Regulation on fluorinated gases (including Directive on mobile air conditioning systems)	23	46	In force
IPPC & non-CO_2 gases	60-70		In force In 2008 the Directive was codified and in 2010 amended by the Industrial Emissions Directive

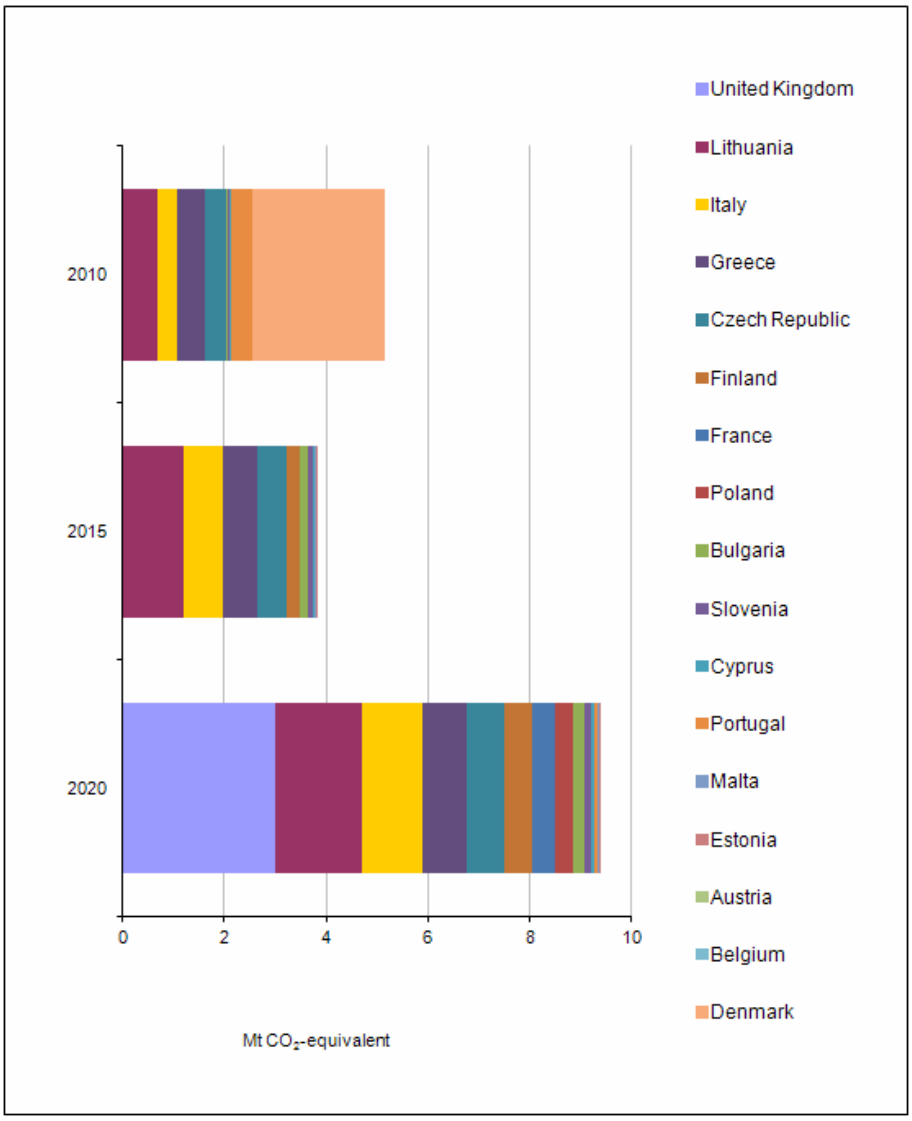
Source: EC, 2011

3.8 Agriculture

3.8.1 All PAMs

15 Member States have quantified emission savings in this sector. Figure 3-11 shows the emission savings estimated by these Member States in the agriculture sector for 2010, 2015 and 2020. The total emission savings are very low and estimated at 5 Mt CO_2-equivalent (2010), 4 Mt CO_2-equivalent (2015) and 9 Mt CO_2-equivalent (2020). The low total savings per year means the data are sensitive to any changes in MS reporting across the time series.

Figure 3-11 Member States' estimates for emission savings in the agriculture sector



Source: ETC/ACM 2011

In 2010, nearly half of the quantitative emission savings reported by Member States come from Denmark's Aquatic Environment Action Plan I and II and the Action Plan for Sustainable Agriculture. These plans were expected to have delivered 2.2 Mt CO_2-equivalent in 2010 and have been linked to the Nitrates Directive. The implementation of the Nitrates Directive in Lithuania was another key policy in the sector expected to deliver 0.7 Mt CO_2-equivalent.

In 2015, the savings from Denmark's Action Plans are no longer reported; hence the decrease in total quantified expected emission savings between 2010 and 2015. Lithuania's implementation of the Nitrates Directive is expected to deliver 1.2 Mt CO_2-equivalent. All other quantified emission savings are under 0.5 Mt CO_2-equivalent for this sector.

By 2020, according to the reported quantified savings, the largest savings in the EU-27 are anticipated to come from the UK's delivery of the English Agriculture sector Greenhouse Gas Action Plan (GHGAP), which is expected to deliver 3 Mt CO_2-equivalent in 2020. This measure is linked to the

Nitrates Directive, the Water Framework Directive, and regulations related to CAP and support for rural development. The implementation of the Nitrates Directive in Lithuania is expected to deliver 1.7 Mt CO_2-equivalent in 2020. Italy's plans to reduce nitrogen fertiliser are also expected to deliver savings of 0.8 Mt CO_2-equivalent and have been linked to the Common Agricultural Policy reform.

3.8.2 CCPM-related PAMs

Emission savings for National policies with quantified savings in the agriculture sector were fewer than 10% of all savings (less than 1% in 2010). CCPM-related measures are less important by 2020 but represent over 90% of quantified savings across the period 2010-2020.

The most influential CCPM in both 2010 and 2020 is the Nitrates Directive. In 2020, the Common Agricultural Policy (CAP) related directives and regulations are also influential.

3.8.3 Comparison with EU wide policy estimates

In the Agricultural Sector, the European Commission anticipated that the Common Agricultural Policy would deliver emission reductions of approximately 60-70 Mt CO_2-equivalent in 2010 for EU-15 – see Table 3-5. In the submissions, although nine Member States listed policies linked to these CAP related directives and regulations (Common rules for direct support schemes under CAP (Regulation (EC) No 1782/2003); Common Agricultural Policy (CAP) Reform (2006/144/EC; CAP "Health Check" 2008 and the "Set aside" regulation (73/2009)" and only Greece, Italy and Denmark provided quantitative estimates and these were relatively small savings of 0.6 Mt CO_2-equivalent, 0.4 Mt CO_2-equivalent and 0.2 Mt CO_2-equivalent, respectively. This reflects the fact that in general these strategy policies are difficult to quantify because they are affecting a number of different emission sources.

The European Commission anticipated that the Nitrates Directive would deliver 10 Mt CO_2-equivalent in 2010 for the EU-15. In the submissions, Denmark was the only Member State in the EU-15 to quantify emission savings and it expected that 2.4 Mt CO_2-equivalent had been delivered by 2010.

Table 3-5 Emission reduction potentials of the EU policies in EU-15 and EU-27 Member States in 2010 and 2020, as estimated by the European Commission – Agriculture

Policies and measures	Emission reduction potential by 2010 in EU-15 (Mt CO_2-eq.)	Emission reduction potential by 2020 in EU-27 (Mt CO_2-eq.)	Stage of implementation /timetable /comments
CAP health check (2003 reform) - Rural development policies - Market policies	60-70 12		Adopted. In 2008 the European Commission decided to move to new changes to the CAP.
Reduction of CH_4 and N_2O from animal manure	1.7		Possibility for support through Rural development programmes
N_2O from soils	10		Improved implementation of the nitrates Directive

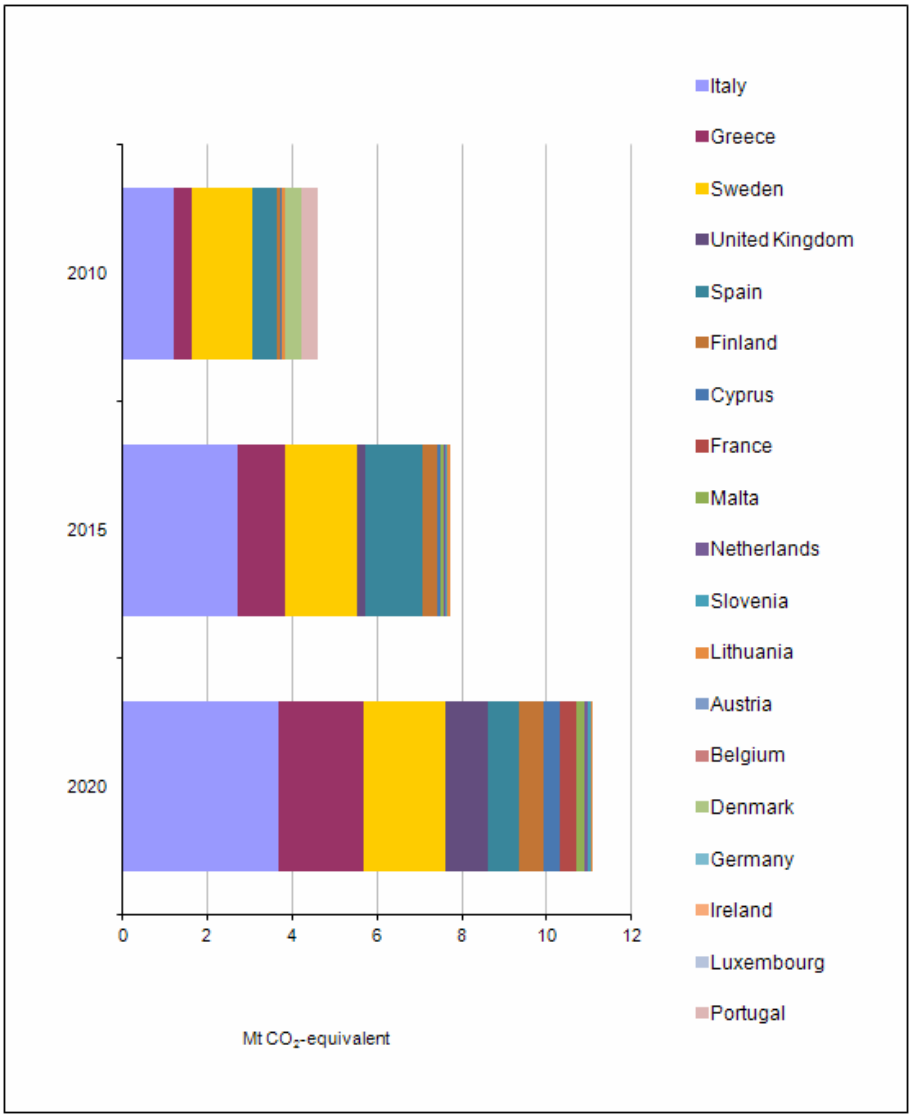
Source: EC, 2011

3.9 Waste

3.9.1 All PAMs

Figure 3-12 shows the quantified emission savings reported by 14 Member States in the waste sector for 2010, 2015 and 2020. The total emission savings are estimated at 5 Mt CO_2-equivalent (2010), 8 Mt CO_2-equivalent (2015) and 11 Mt CO_2-equivalent (2020). Emissions savings from the waste sector are strongly influenced by the estimates of policy impacts in Italy, Greece, Sweden and Spain, together these Member States are responsible for more than 50% of the quantified emission savings in the waste sector.

Figure 3-12 Member States' estimates for emission savings in the Waste sector



Source: ETC/ACM 2011

In Sweden rules on municipal waste planning, taxes on landfilling of waste, prohibition of combustible and organic waste and other related measures from 2002-2005 are expected to have delivered 1.4 Mt CO_2-equivalent in 2010. This composite measure is linked to the Landfill Directive. In Italy, also linked to the Landfill Directive, the compliance with separate collection targets is set to increase recycling and reduce biodegradable waste disposed to landfills. This is expected to have delivered 1.2 Mt CO_2-equivalent in 2010. This separation process is also being established in Spain where it is expected to have delivered 0.6 Mt CO_2-equivalent in 2010.

In 2015, these key policies are again delivering the largest emission savings with savings of 2.7 Mt CO_2-equivalent (Italy); 1.7 Mt CO_2-equivalent (Sweden) and 1.3 Mt CO_2-equivalent (Spain). Greece also expects that by 2015 larger savings will come from the recovery of organic waste and reductions in landfill. It anticipates savings of just over 1 Mt CO_2-equivalent will be saved from recovery of organic waste and recovery of biogas & flaring of landfill gas in all managed sites for urban centres with over 100,000 inhabitants.

Along with further increases in the magnitude of emission savings expected from these previously mentioned diversion of waste from landfill policies in 2020, the UK's review of waste policies is expected to deliver just under 1 Mt CO_2-equivalent.

3.9.2 CCPM-related PAMs

Over 79% of savings from quantified policies in the waste sector are CCPM-related PAMs. By 2020, emission savings from quantified national PAMs has decreased to about 10% of all quantified savings. The most influential CCPM is the Landfill Directive in 2010 and 2020 (six Member States quantify emission savings in 2010 and 2020). In 2020, the Packaging and packaging waste Directive is also influential and to a lesser extent the Waste management framework Directive.

3.9.3 Comparison with EU wide policy estimates

In the waste sector, the European Commission anticipated that the Landfill Directive would deliver emission reductions of approximately 41 Mt CO_2-equivalent in 2010 for EU-15, as shown in Table 3-6. The Landfill Directive was the most linked to CCPM, in the EU-27 - 18 Member States included policies linked to it in their submissions and for EU-15 - 12 Member States included it as the first linked EU policy. However, the anticipated savings were low or often not quantified. Sweden reported the largest emission savings of 1.4 Mt CO_2-equivalent, followed by Italy 1.2 Mt CO_2-equivalent, Greece 0.5 Mt CO_2-equivalent; Portugal 0.4 Mt CO_2-equivalent and Denmark 0.3 Mt CO_2-equivalent. Seven out of 12 EU-15 Member States did not quantify the emission savings for 2010 and the total expected emission savings were therefore only 4 Mt CO_2-equivalent.

The European Commission anticipated that the WEEE Directive would deliver 35 Mt CO_2-equivalent in 2010 from EU-15 Member States. No Member States quantified emissions from this Directive as a first, second or third EU policy. Spain quantified savings of 2 Mt CO_2-equivalent with a fourth EU-policy linkage.

Table 3-6 Emission reduction potentials of the EU policies in EU-15 and EU-27 Member States in 2010 and 2020, as estimated by the European Commission – Waste

Policies and measures	Emission reduction potential by 2010 in EU-15 (Mt CO_2-eq.)	Emission reduction potential by 2020 in EU-27 (Mt CO_2-eq.)	Stage of implementation / timetable / comments
Landfill Directive	41		In force
Directives on waste electrical and electronic equipment (WEEE)	35		In force. Revised directive in 2008

Source: EC, 2011

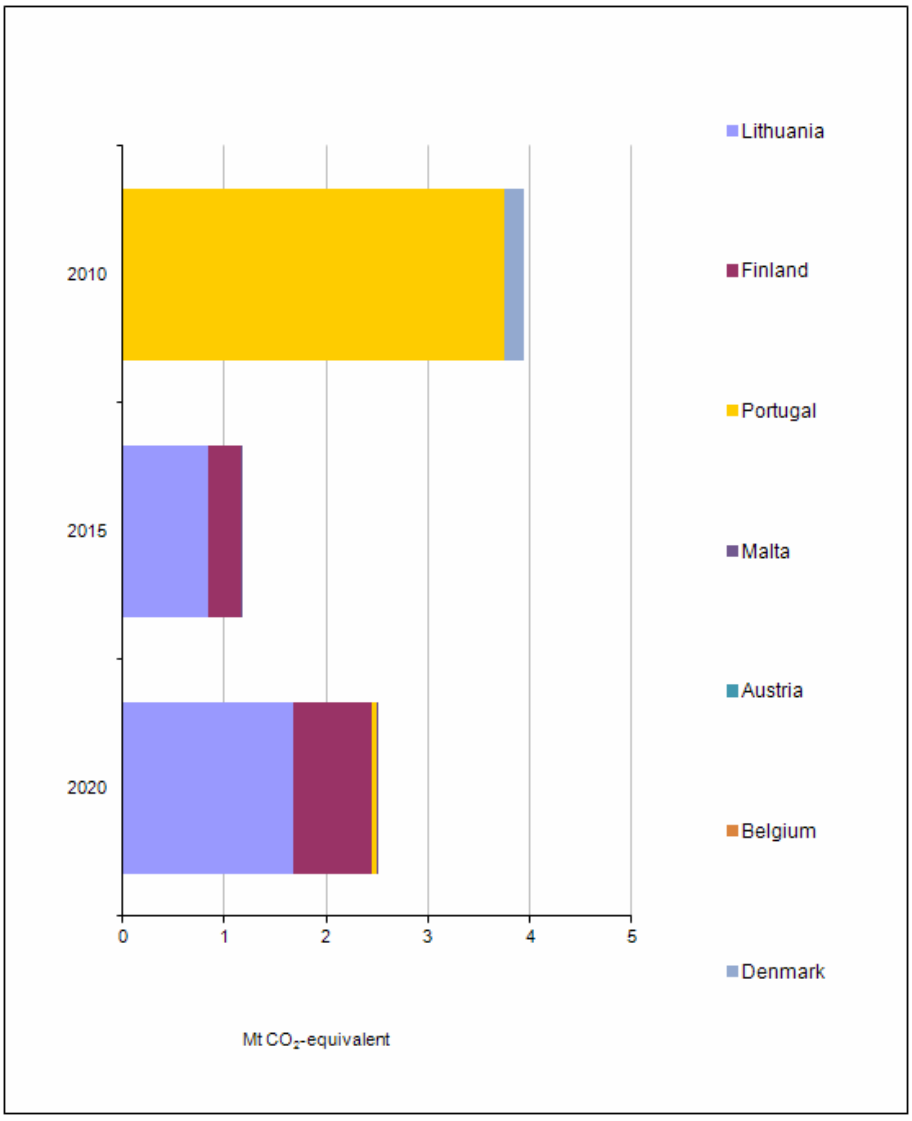
3.10 LULUCF

3.10.1 All PAMs

Very few quantitative emission savings are linked to the Land Use Land Use Change and Forestry (LULUCF) sector. Only five member states (Denmark, Finland, Lithuania, Malta and Portugal) report

quantified emission savings from the LULUCF sector across the time series. Figure 3-13 shows the emission savings estimated by Member States in the sector for 2010, 2015 and 2020. The total emission savings are estimated at 4 Mt CO_2-equivalent (2010), 1 Mt CO_2-equivalent (2015) and 3 Mt CO_2-equivalent (2020). The low total savings per year means the data are sensitive to any changes in Member State reporting across the time series.

Figure 3-13 Member States' estimates for emission savings in the LULUCF sector



Source: ETC/ACM 2011

The highest quantified emission savings are reported in Portugal where the programme for the sustainable development of Portuguese forests with the aim to increase forested area is expected to have delivered 3.7 Mt CO_2-equivalent. In Denmark, similar aims to increase forested area by up to 500,000 ha in 100 years (through afforestration in the public sector and subsidies to encourage private afforestation on agricultural land) have achieved 0.2 Mt CO_2-equivalent.

In terms of future planned measures, Lithuania's plan for afforestation of low fertility soils (non CCPM National Policy) is expected to deliver emission savings of 0.8 Mt CO_2-equivalent (2015) and

1.7 Mt CO_2-equivalent (2020). Finland has plans to increase the proportion of grass crops on organic soils and this is expected to deliver emission savings of 0.3 Mt CO_2-equivalent (2015) increasing to just under 1 Mt by 2020. In Finland this measure is linked to the pre-accession measures for agriculture and rural development regulation.

3.10.2 CCPM-related PAMs

All emission savings from quantified policies in 2010 are from national PAMs. By 2020, the proportion of emission savings from quantified national PAMs has decreased due to an increase in CCPM-related savings but savings from national PAMs still represent almost 70% of savings.

The support for rural development regulations were the only CCPM linked to for policies in the LULUCF sector in 2010 and the pre-accession measures for agriculture and rural development in 2020.

3.10.3 Comparison with EU wide policy estimates

The European Commission anticipated emission savings of 14 Mt CO_2-equivalent from national forest expansion in the EU-15. Only three EU-15 Member States (Denmark, Finland and Portugal) report quantified emission savings from the LULUCF sector in 2010. The majority of these savings come from Portugal where expected savings were 4 Mt CO_2-equivalent.

Table 3-7 Emission reduction potentials of the EU policies in EU-15 and EU-27 Member States in 2010 and 2020, as estimated by the European Commission – Forests

Policies and measures	Sequestration potential by 2010 in EU-15 (Mt CO_2-eq.)	Emission reduction potential by 2020 in EU-27 (Mt CO_2-eq.)	Stage of implementation /timetable /comments
EU Forest Action Plan	n/a	n/a	Adopted. The Forest Action Plan presented in June 2006 builds on the EU's Forestry Strategy adopted in 1998.
Afforestation and reforestation: - Afforestation programmes - Natural forest expansion	14		Possibility for support through measures for forestry scheme of afforestation of agricultural land and reforestation under the rural development programmes
Restoration of forests damaged by natural disasters, fires, pests damage, and forest fire prevention actions			Possibility for support through rural development programmes, specific measure for restoring forestry potential and introducing prevention actions
Forest management (various measures to enhance carbon sink pool, such as continuous forest cover, special regeneration systems)	19		Possibility for support through forestry-environment scheme measures of rural development programmes; uptake of measures, dependent on national implementation.

Source: ETC/ACM 2011

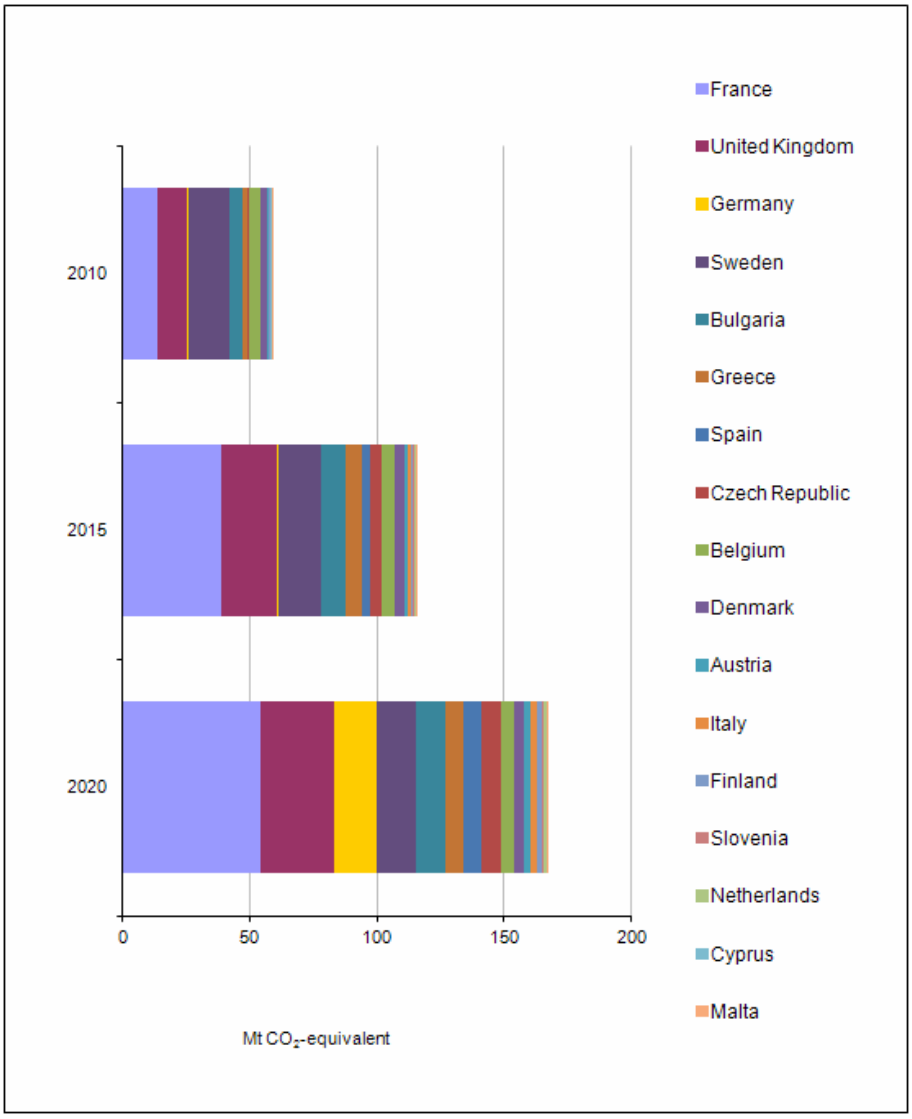
3.11 Cross-cutting

In this section the definition of 'cross-cutting' differs from the definition in Chapter 2. A large number of national policies have been linked to more than one sector and it is not possible to apportion the estimated emission savings from a national measure to more than one sector without making an assumption about the distribution between the sectors. Equally, if policies which affect more than one sector are assumed to be separate measures in each sector, there would be double-counting of the total emission reductions. Therefore, for the purposes of the quantitative analysis any measure which is linked to more than one sector has been categorised as 'cross-cutting'. Any sectors that were originally categorised as 'cross-cutting' by Member States continue to be classified as such.

3.11.1 All PAMs

The Member States that have quantified the largest savings in the cross-cutting sector are France, the UK, Sweden, Bulgaria and Germany. 18 Member States have quantified savings for cross-cutting measures. Figure 3-14 shows the emission savings estimated by these Member States for 2010, 2015 and 2020. The total emission savings are estimated at 59 Mt CO_2-equivalent (2010), 116 Mt CO_2-equivalent (2015) and 167 Mt CO_2-equivalent (2020).

Figure 3-14 Member States' estimates for emission savings in the Cross-cutting sector



Source: ETC/ACM 2011

The largest cross-cutting savings are expected to have been delivered from Sweden's CO_2 tax (non CCPM National Policy) with emissions savings of 16 Mt CO_2-equivalent in 2010. The second largest cross-cutting policy is the French biofuel plan completed by the national plan of action for energy

renewables with emissions savings of 5 Mt CO_2-equivalent. This plan is linked to both the Biofuels Directive and the RES Directive.

In 2015, Sweden's CO_2 tax is still anticipated to be significant with emissions savings of 17 Mt CO_2-equivalent expected. The second largest emissions savings are expected from the EU Emission Trading Scheme (EU ETS) in France with estimated savings of 11 Mt CO_2-equivalent. The expected emission savings from France in 2015 are particularly significant; four of the top ten quantified cross-cutting policies are French. Large savings are expected from the French biofuel plan complemented by the national plan of action for energy renewables and associated with emissions savings of 8 Mt CO_2-equivalent. This policy is linked to both the Biofuels Directive and the RES Directive. The fourth influential French policy is energy saving certificates linked to the End-use and energy services Directive and again expected to deliver substantial emission savings of 7 Mt CO_2-equivalent.

By 2020, the largest emissions savings are expected from the EU ETS, both in France with estimated savings of 21 Mt CO_2-equivalent and in Germany with estimated savings of 15 Mt CO_2-equivalent. In 2020, the UK's most influential cross-cutting policy is the National Products Policy, which aims to reduce the energy use of appliances on the market (linked to the End-use and energy services Directive and the Eco-design Directive). This is expected to deliver large emission savings of 12 Mt CO_2-equivalent. Like France, the UK has a number of quantified measures which together make up the large UK contributions to emission savings in 2020. This includes Climate Change Agreements, the Carbon Reduction Commitment, the extension of the Climate Change Agreements and the Building Regulations 2010, which all contribute to the large emission savings seen in Figure 3-14.

3.11.2 CCPM-related PAMs

Over 66% of savings from quantified policies in the cross-cutting sector are from CCPM-related policies. 33% of savings from quantified policies in 2010 are from national policies. By 2020 this has reduced to 23% of savings from quantified policies. The most influential cross-cutting CCPMs in 2010 are the ET ETS, the end-use efficiency and energy services Directive and the Kyoto protocol project mechanisms. The Energy performance of buildings Directive joins these CCPMs in being influential in 2020.

3.11.3 Comparison with EU wide policy estimates

The European Commission anticipated emission savings of 146 Mt CO_2-equivalent from the EU ETS by 2010 from the EU-15. Only four EU-15 Member States (Belgium, France, Germany and the United Kingdom) report quantified emission savings linked to the EU ETS for 2010. The expected emission savings from these Member States are 9.7 Mt CO_2-equivalent where the largest savings are expected to arise from Belgium and the United Kingdom (4.1 Mt CO_2-equivalent each). No additional emission savings result from taking into account other policies where the EU ETS was the second CCPM the policy was linked to. The large difference is as a result of the incompleteness of the reported information. However, three of the largest emitters in the EU-15 have reported their emission savings, thus it is likely that even if all Member States reported a quantified emission saving, the European Commission's estimate would be much higher.

Finland was the only Member State in the EU-15 to quantify emission savings from the Kyoto Protocol project mechanisms (Directive 2004/101/EC).

Table 3-8 Emission reduction potentials of the EU policies in EU-15 and EU-27 Member States in 2010 and 2020, as estimated by the European Commission – Forests

Policies and measures	Sequestration potential by 2010 in EU-15 (Mt CO_2-eq.)	Emission reduction potential by 2020 in EU-27 (Mt CO_2-eq.)	Stage of implementation /timetable /comments
EU emissions trading scheme	146		In force
Revision of the monitoring mechanism	N/a		In force
Link Kyoto flexible mechanisms to emissions trading	187.5		In force

Source: EC, 2011

References

EEA, 2011a: Quality assurance / quality control procedure for the reporting of policies and measures under Decision 280/2004/EC (the EU Monitoring Mechanism Decision).

EEA, 2011b: Additional guidance for Member States for the reporting of Policies and Measures under the EU Monitoring Mechanism Decision in 2011.

EEA, 2011c: Greenhouse gas data viewer, Copenhagen.
http://dataservice.eea.europa.eu/PivotApp/pivot.aspx?pivotid=475

EEA, 2011d: Greenhouse gas emission trends and projections in Europe 2011, Tracking progress towards Kyoto and 2020 targets. EEA Technical report No xx1/2011. Available at:
http://www.eea.europa.eu/publications/eea_report_2009_9/ghg-trends-and-projections-2009-summary.pdf

EEA, 2012: Assessment of the Member States' projections submitted under the EU Monitoring Mechanism in 2011.

EC, 2011: Commission staff working paper accompanying the document Report from the Commission to the European Parliament and the Council, Progress towards achieving the Kyoto Objectives (Annex). Available at:
http://ec.europa.eu/clima/policies/g-gas/docs/sec_2011_1151_en.pdf

IPCC, 1997: Intergovernmental Panel on Climate Change (IPCC), 1997. Revised 1996 IPCC guidelines for national greenhouse gas inventories. Geneva. Available at:
http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.html
UNFCCC

UNFCCC, 1999: Guidelines for the preparation of National Communications by Parties included in Annex I to the Convention. FCCC/CP/1999/7. Available at:
http://unfccc.int/documentation/documents/advanced_search/items/3594.php?rec=j&priref=600001361#beg

UNFCCC, 2004: Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories (following incorporation of the provisions of decision 13/CP.9). FCCC/SBSTA/2004/8. Available at: http://unfccc.int/resource/docs/2004/sbsta/08.pdf

Annexes

A. Indicative list of CCPMs provided to Member States for reporting national policies and measures

The following table containing a list of EU policies was provided in the reporting template.

Cross-cutting: EU ETS directive 2003/87/EC as amended by Directive 2008/101/EC and Directive 2009/29/EC
Cross-cutting: Kyoto Protocol project mechanisms (Directive 2004/101/EC)
Cross-cutting: Integrated pollution prevention and control (IPPC) (Directive 96/61/EC) and recast (Directive 2008/1/EC)
Cross-cutting: National Emission Ceilings for certain pollutants (Directive 2001/81/EC)
Cross-cutting: Effort Sharing Decision (406/2009/EC)
Energy supply: Electricity production from renewable energy sources (Directive 2001/77/EC)
Energy supply: Promotion of cogeneration (Directive 2004/8/EC)
Energy supply: Taxation of energy products and electricity (Directive 2003/96/EC)
Energy supply: Internal electricity market (Directive 2003/54/EC) including provision of the third package
Energy supply: Internal market in natural gas (Directive 98/30/EC) including provision of the third package
Energy supply: Emissions from large combustion plants (Directives 88/609/EEC and 2001/80/EC)
Energy supply: Geological storage of CO2 (Directive 2009/31/EC)
Energy supply: European Energy programme for Recovery (Regulation 2009/663/EC)
Energy supply: Completion of the internal energy market (including provisions of the 3rd package)
Energy supply: RES directive (Directive 2009/28/EC)
Energy consumption: Energy performance of buildings (Directive 2002/91/EC)
Energy consumption: Recast of the Energy performance of buildings (Directive 2010/31/EC)
Energy consumption: End-use efficiency and energy services (Directive 2006/32/EC)
Energy consumption: Ecodesign requirements for energy-using products (Directive 2005/32/EC) and its implementing regulations: 1275/2008 (stand-by), 107/2009 (simple set-to boxes), 245/2009 (office/street lighting), 244/2009 (household lighting), 278/2009 (external power supplies), 642/2009 (TVs (+labelling)), 640/2009 (electric motors), 641/2009 (circulators), 643/2009 (freezers/refrigerators (+labelling)), 1222/2009 (labelling for tyres)
Energy Consumption: Recast of the Ecodesign requirements for energy-using products (Directive 2009/125/EC)
Energy consumption: Energy labelling of household appliances (Directive 2003/66/EC (refrigerators - freezers), 2002/40/EC (electric ovens), 2002/31/EC (air-conditioners), 99/9/EC (dishwashers), 98/11/EC (lamps), 96/89/EC (washing machines), 96/60/EC (washer-driers)
Energy consumption: Efficiency fluorescent lighting (Directive 2000/55/EC)
Energy consumption: Motor challenge programme
Energy consumption: Eco-management and audit scheme (EMAS) (Regulation No 761/2001)

Energy consumption: Energy-efficiency labelling for office equipment (Reg No. 2422/2001) and recast (Regulation No. 106/2008)
Energy consumption: Energy Star Program
Transport: Promotion of clean and energy efficient road transport vehicles (Directive 2009/33/EC)
Transport: Voluntary agreement with car manufacturers to reduce specific CO2 emissions (ACEA, KAMA, JAMA)
Transport: Fuel Quality Directive (Directive 2009/30/EC)
Transport: Strategy for cars CO2 (Regulation 443/2009)
Transport: Labelling of new passenger cars (Directive 1999/94/EC)
Transport: Labelling of tyres (Regulation 1222/2009)
Transport: Biofuels Directive (Directive 2003/30/EC)
Transport: Shifting the balance between modes of transport, in particular towards rail (2001/12/EC, 2001/13/EC, 2001/16/EC of 15/03/01 Regulation 881/2004 of 29/04/2004, 2001/49/EC, 2001/50/EC, 2001/51/EC of 29/04/2004)
Transport: Eurovignette Directive (2006/38/EC)
Transport: Integrated European railway area (2nd + 3rd Railway package) (COM(2002)18 final)
Transport: Environmental performance freight transport (Marco Polo Programme)
Transport: Regulation EURO 5 and 6 2007/715/EC
Transport: Regulation Euro VI for heavy duty vehicles 2009/595/EC
Transport: Motor Vehicles Directive (2006/40/EC)
Transport: Planned limit values for vans Directive
Industrial Process: F-gas regulation (Regulation No 842/2006)
Industrial Process: HFC emissions from air conditioning in motor vehicles (Directive 2006/40/EC)
Agriculture: Nitrates Directive (Directive 91/676/EEC)
Agriculture: Common rules for direct support schemes under CAP (Regulation (EC) No 1782/2003)
Agriculture: Support for rural development (Regulation (EC) No 1783/2003 amending a number of other Regulations)
Agriculture: Transition to rural development support (Regulation (EC) No 2603/1999)
Agriculture: Agricultural production methods compatible with environment (Regulation (EEC) No 2078/92)
Agriculture: Aid scheme for forestry measures in agriculture (Regulation (EEC) No 2080/92)
Agriculture: Emission by engines to power agricultural or forestry (Directive 2000/25/EC)
Agriculture: Pre-accession measures for agriculture and rural development (Regulation (EC) No 1268/1999)
Agriculture: Water Framework Directive 2000/60/EC
Agriculture: Common Agricultural Policy (CAP) Reform (2006/144/EC)
Agriculture: CAP "Health Check" 2008 and the "Set aside" regulation (73/2009)
Waste: Packaging and packaging waste (Directive 94/62/EC, 2004/12/EC, 2005/20/EC)
Waste: Landfill Directive (Directive 1999/31/EC)
Waste: tr Framework Directive (Directive 2006/12/EC)
Waste: Waste electrical and electronic equipment Directive (Directive 2002/95/EC)
Waste: Waste Management Framework Directive (2008/98/EC)

B. Results of the QA/QC procedure

This Annex presents the results of the quality of the PAMs information reported by the Member States following the QA/QC procedure. The detailed steps followed in the QA/QC procedure can be found in the 'Quality assurance / quality control procedure for the reporting of policies and measures under Decision 280/2004/EC (the EU Monitoring Mechanism Decision)' document (EEA, 2011a). The quality is presented focused on the TCCCA elements of IPCC inventory reporting and Timeliness. The definition of each of the TCCCA is based on the definition of in the context of inventories provided by the UNFCCC (UNFCCC, 2004).

a. Timeliness

The MM Decision requires Member States to submit the information on PAMs by 15th March biannually (2011 was a reporting year). Timeliness is important to ensure that the QA/QC procedure can be carried out with adequate time for Member States to respond to requests for further information or clarification. Timely submission and QA/QC ensures that up to date information reported by the Member States can be compiled and be made available to the stakeholders for further analysis.

There were 9 Member States who submitted their reports on or before the deadline on 15-March-2011. Portugal, Germany and Denmark did not report any updated PAMs information this year. The remaining reports were submitted after the deadline.

Table B-1: Submission dates of Member States

Member State	Date of submission	
Sweden	14/03/2011	On time
Austria	15/03/2011	
Bulgaria	15/03/2011	
Estonia	15/03/2011	
Greece	15/03/2011	
Netherlands	15/03/2011	
Slovakia	15/03/2011	
Spain	15/03/2011	
United Kingdom	15/03/2011	
Poland	16/03/2011	After deadline
Ireland	23/03/2011	
Slovenia	30/03/2011	
Italy	06/04/2011	
Lithuania	06/04/2011	
Romania	08/04/2011	
Finland	21/04/2011	
Malta	21/04/2011	
Belgium	12/05/2011	
France	19/05/2011	
Cyprus	28/06/2011	
Czech republic	28/06/2011	
Latvia	01/07/2011	
Luxembourg	01/08/2011	
Hungary	26/08/2011	
Portugal	-	2009 data submitted
Germany	-	
Denmark	-	

Source: ETC/ACM 2011

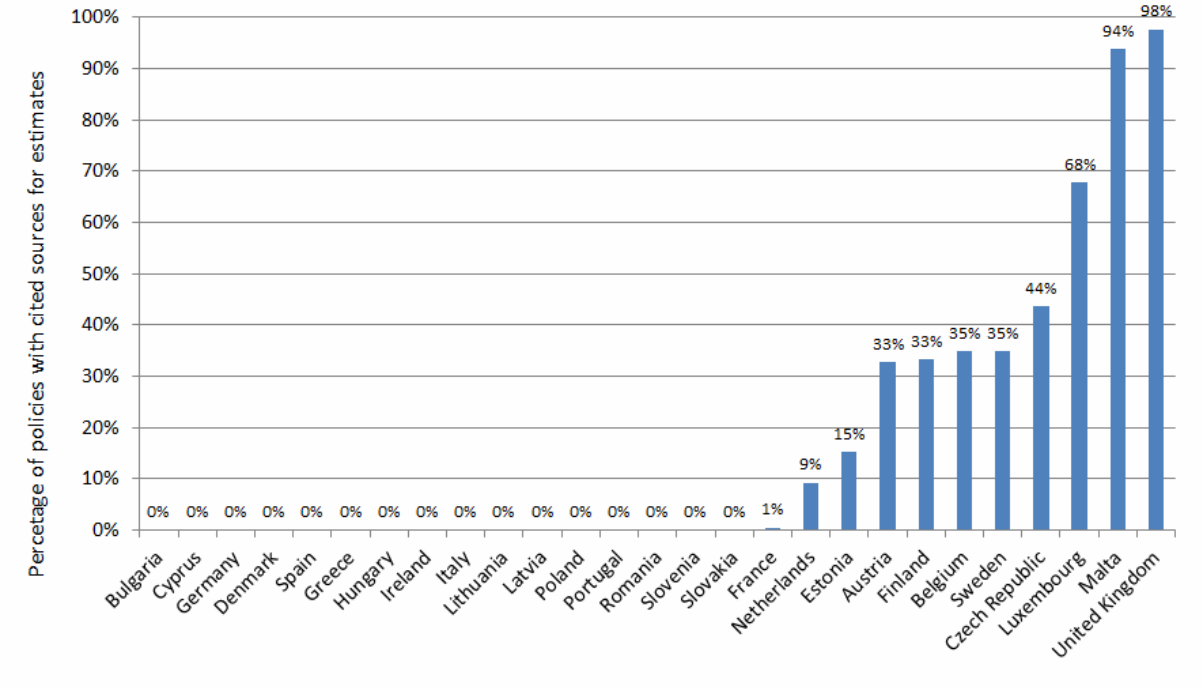
b. Transparency

Transparency relates to the clarity of the assumptions and methodologies used by Member States. The assessment of transparency is based on whether the reference or source of ex-ante emission saving was reported.

Recording methodologies

Member States have the option to specify the methodology and sources used to calculate their projections for emission savings. In the 2011 submissions, just 20% of total reported policies included a reference for the source of emission estimates. The majority of Member States (16) did not report this information at all. However, this requirement was not a mandatory part of the submission.

Figure B-1: Recorded methodologies for emission estimates



Source: ETC/ACM 2011

c. Completeness

The PAMs information reported by the Member States can be split into two categories:

- Information required under the MM Decision (mandatory); and
- Information recommended to be reported in addition, requested by the European Commission (recommended);

Completeness of reporting is defined in terms of the proportion of the above information that was actually reported by the Member States in their submission. The completeness of the reported PAMs is presented split into four categories, mandatory or recommended and further if the information is qualitative or quantitative. Member States are concentrating their efforts on reporting the mandatory information, which shows good overall completeness. There is a substantial difference in completeness across the Member States. This suggests that it may be possible for Member States who are finding it difficult to report all of the information to learn from the Member States who are able to do so.

i. Mandatory qualitative information

Member States are required to submit qualitative information listed below. The completeness of the mandatory qualitative information required under the MM Decision was in general quite high.

Name of policy
Reported for all PAMs by all Member States

Policy objective

Information reported for all PAMs by 21 Member States. Data is missing for some PAMs reported by Cyprus, Germany, Italy, the Netherlands, Poland and Sweden, accounting for 1% of all reported PAMs.

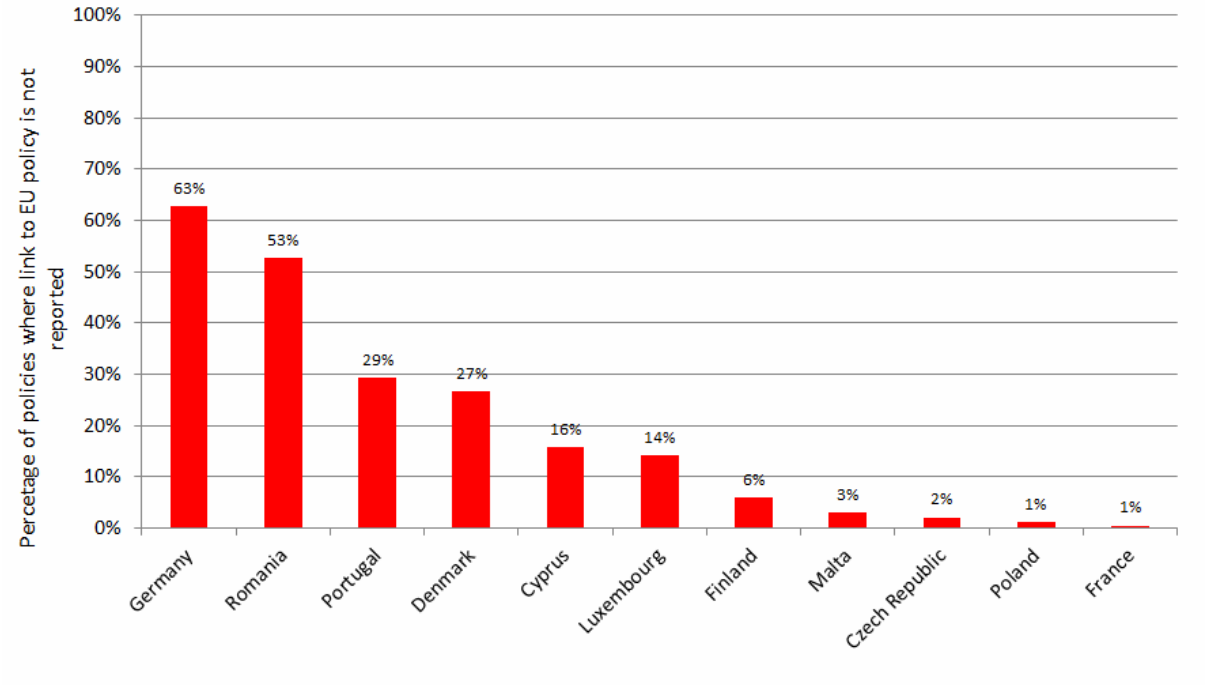
Type of instrument used by the policy

Information reported for all PAMs by 25 Member States but missing for one policy reported by Slovakia and 25% of PAMs reported by Poland.

EU policy addressed by / related to the PAM

The link with EU policies was not reported for 112 policies out of 1,397 reported in total. 16 Member States reported the EU policy addressed by the PAM for all reported PAMs. The completeness of the information for those Member States that did not is presented in Figure B-2.

Figure B-2 Percentage of PAMs with no information reported on link with EU policy



Source: ETC/ACM 2011

GHG affected by the policy

The gas affected by the policy was complete for most policies. Only five Member States (Finland, Malta, Poland, Portugal and Sweden) did not report the information for 14 policies in total.

Sectors targeted by the policy

The information on the sector targeted by the policy was reported for all policies;

Policy status (planned, adopted, implemented or expired)

The information on the implementation status was reported for the majority of PAMs by most Member States. Only four Member States (Finland, Malta, Romania and Sweden) did not report the information for 11 policies in total.

Indicators to monitor and evaluate the progress over time

Information was incomplete for over 55% of the PAMs reported. Only four Member States (Bulgaria, Estonia, Spain and Luxembourg) reported the indicator to monitor and evaluate the progress over time for all PAMs.

Policy interactions

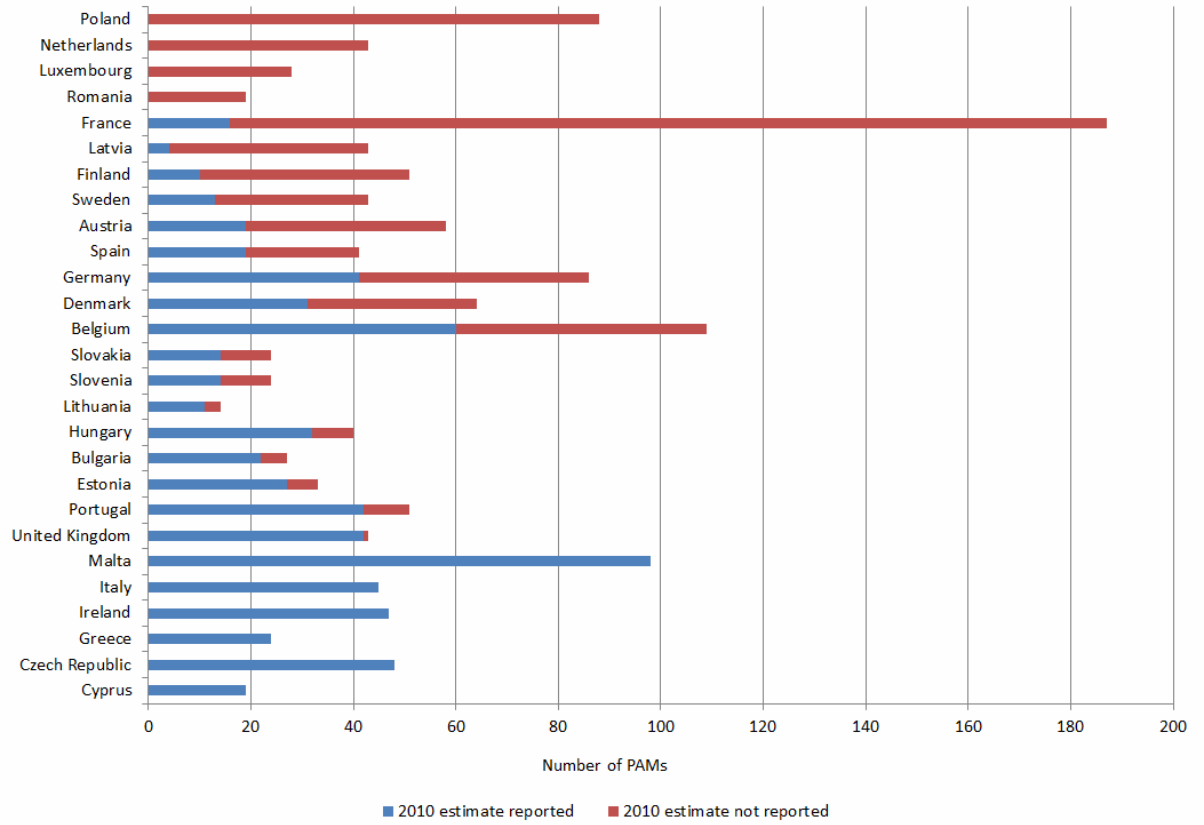
Information was incomplete for over 68% of the PAMs reported. For PAMs where the information was reported, only 35% included information on how the policies interact. Only six Member States (Belgium, Czech Republic, Finland, Luxembourg, Spain, and the United Kingdom) reported this information on if policies interacted with other policies for all PAMs.

ii. Mandatory quantitative information

Under the MM Decision, Member States are required to report quantitative estimates of the effect of PAMs on emissions by sources and removals by sinks of greenhouse gases between the base year and subsequent years, including 2005, 2010 and 2015. Member States found it more challenging to provide mandatory quantitative information compared to the mandatory qualitative information. Some Member States may not estimate the ex-ante emission savings of PAMs and the information may not be available.

Emission saving estimates in 2010 was reported for half of all reported PAMs. No estimates were reported by four Member States (Luxembourg, the Netherlands, Poland and Romania) and six Member States (Cyprus, Czech Republic, Greece, Ireland, Italy and Malta) reported 2010 emission savings for all PAMs reported. Malta and Belgium reported 2010 emission saving estimated for the highest number of PAMs.

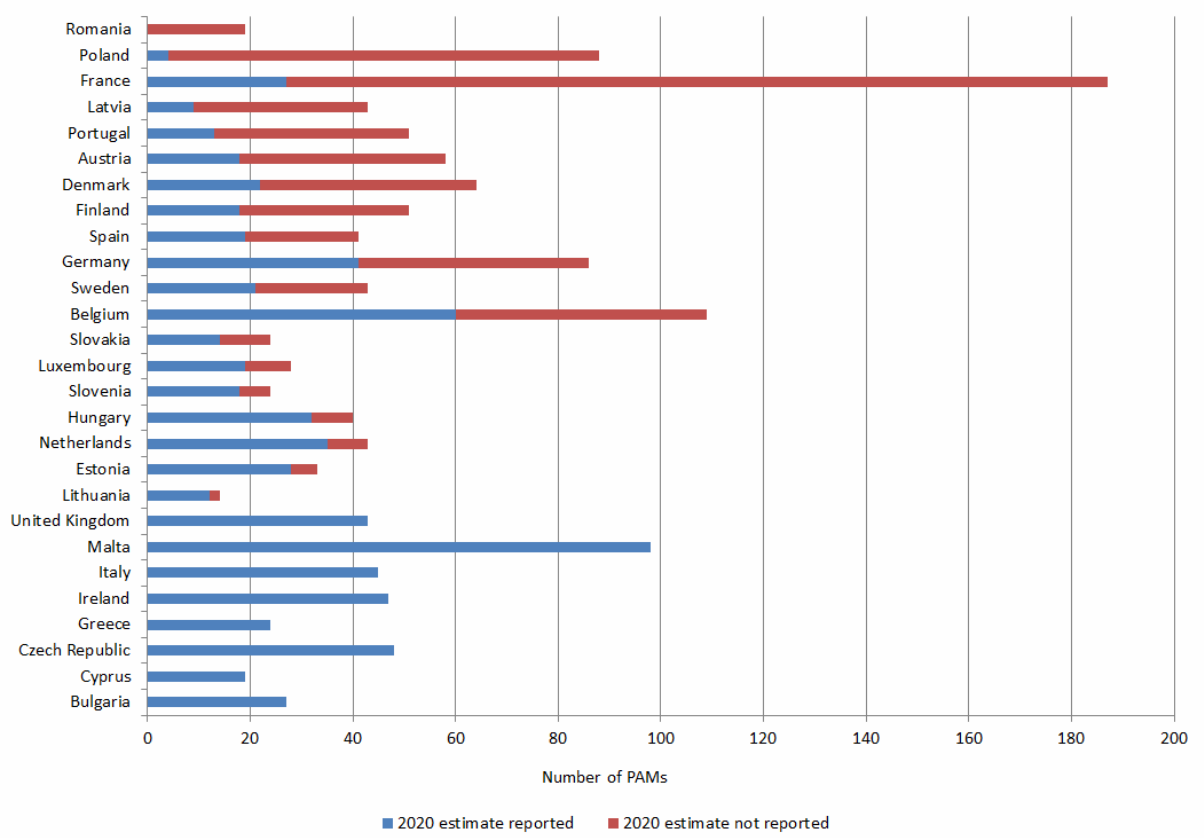
Figure B-3 Completeness of quantitative 2010 emission saving estimates by Member State



Source: ETC/ACM 2011
Note: The Member States have been ranked according to the percentage completeness of the emission savings reported

The completeness of the emission saving estimates for 2020 is 4.5% higher than the completeness of the 2010 estimates. Whereas four Member States reported no emission savings for 2010, only Romania reported no savings for 2020. In addition to the Member States that reported 2010 emission savings for all PAMs, 2020 emission savings were reported for all PAMs by Bulgaria and the United Kingdom.

Figure B-4 Completeness of quantitative 2020 emission saving estimates by Member State



Source: ETC/ACM 2011
Note: The Member States have been ranked according to the percentage completeness of the emission savings reported

iii. Recommended qualitative information

The reporting of the following qualitative information is recommended. Recommended information had higher omission rates. The completeness of the recommended qualitative information varies both by Member State and information requested.

- Brief description of the policy;

  Complete reporting by nine Member States (Belgium, Bulgaria, Denmark, Finland, Hungary, Luxembourg, Latvia, Portugal and the United Kingdom).

- Whether the policy affects the EU ETS or non-ETS sector;

  Information reported for all PAMs by 17 Member States. 10 Member States (Austria, Czech Republic, Germany, Denmark, France, Ireland, Italy, Malta, Poland and Portugal) did not report the information for 271 policies in total. The majority of the non-reporting is accounted for by Denmark, Germany and Portugal because this information was not requested in 2009 and these Member States did not submit new information in 2011.

- Implementation period;

20 Member States reported the start and end year of the implementation period for all PAMs. Information was missing for PAMs reported by Cyprus, Germany, Italy, Lithuania, Latvia, Slovenia and Spain.

- Entities responsible for implementing the policy

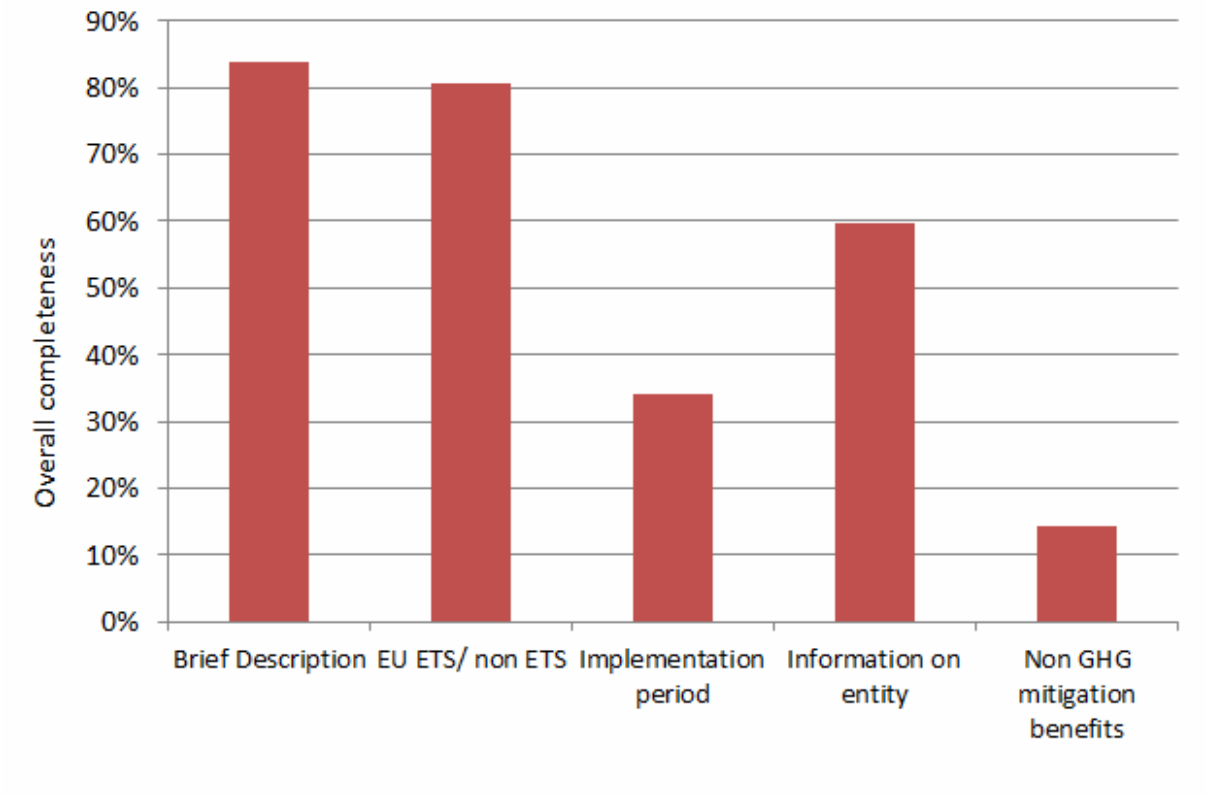
  Seven Member States (Cyprus, Czech Republic, Luxembourg, Portugal, Romania, Slovenia and the United Kingdom) completed information on the entity responsible for implementing the policy for all PAMs reported.

- Reference / source of information for the ex-ante estimates (c.f section b);

- Policy interaction information about non-GHG mitigation benefits

  No Member States reported this information fully. The completeness is highest for the submissions made by the United Kingdom (86%) and Czech Republic (67%).

Figure B-5 Completeness of the recommended qualitative information



Source: ETC/ACM 2011

84% of all reported PAMs included a brief description of the policy. Information on the non-GHG mitigation benefits was the least complete (c.f Figure B—5).

iv. Recommended quantitative information

All information linked to ex-post emission savings, cost of emission mitigation and ex-ante emission savings split by EU ETS and non ETS sectors are categorised under recommended quantitative information. This information is rarely reported. For example, ex-post emission reduction estimates were only reported by Romania, Finland, the United Kingdom, Belgium, Austria and France and only

for 64 PAMs. Information on cost of emission mitigation is only reported for 28 PAMs (by Czech Republic, Denmark, Finland, France, Lithuania, Spain and the United Kingdom).

d. Comparability

Comparability is a measure of how comparable the reported information is among different Member States, and between different submissions from the same Member State.

Quantitative information

Currently, there is no agreed methodology for calculating ex-ante or ex-post emissions savings, or the cost of emission mitigation. As a result, the comparability of the quantitative information is low.

Qualitative information

The UNFCCC document 'Guidelines for the preparation of national communications by Parties'[4] and the 'Annotated Outline for Fifth National Communications of Annex I Parties'[5] under the UNFCCC contain guidance on how the information on policies and measures should be reported. These documents provide insight on the information to be reported under the MM Decision, but did not contain exact details and best practice to ensure that the same information is reported by all Member States (which would increase comparability). To fulfil this gap in the guidance, the ETC-ACM developed a Policies and Measures, a guidance document in 2011 (EEA, 2011b).

The PAMs information in this report and in the EEA's Database on Policies and Measures in Europe is consistent with the above guidelines to the extent possible. However, although issues were identified in the QA/QC procedure, not all issues identified were addressed by the Member States and many comparability issues remain.

Reporting format

In order to ensure clear and comparable reporting, Member States were encouraged to use the excel-based reporting template provided to them. For the 2011 submissions, 19 Member States used the recommended reporting format. Member State's data was more comparable if the reporting template was used, for example, because qualitative information such as entities responsible for implementing the PAM is reported based on a selection.

Common notation

Currently, use of notation is manually checked by the reviewers to ensure consistency within the notation keys used in the reporting. Examples of potentially confusing usage include the usage of "0" to report zero emission savings (no emission savings expected), but the "0" can also denote that emissions cannot or have not been quantified. Member States were requested to distinguish the difference between them, however, this lack of clarity remains.

e. Consistency

Consistency of the information is a measure of if all the elements reported for a policy properly align.

[4] http://unfccc.int/documentation/documents/items/3595.php?rec=j&priref=600001361

[5] http://unfccc.int/files/national_reports/annex_i_natcom_/application/pdf/nc5outline.pdf

Internal consistency

Internal consistency requires all the elements of a policy to properly align, for example: the name and objective of the policy match and the GHG targeted are those one would expect from the description of the policy. Following implementation of the QA/QC procedure, seven Member States (Austria, Estonia, Greece, Italy, Poland, Slovakia and the United Kingdom) were left with unresolved inconsistencies within their reported information.

All emission savings reported split into the proportion affecting the EU ETS and non ETS sector were consistent with the total emission savings. This inconsistency was unresolved for one policy reported by Slovakia.

f. Accuracy

Accuracy is a relative measure of the exactness of a reported emission saving. Estimates should be accurate in the sense that they are systematically neither an over- nor under- estimate of the true emissions savings, as far as can be judged, and uncertainties should be reduced as far as is practical.

As part of the QA/QC procedure, a number of checks were performed on the emission savings reported in the submission. Checks included, checking consistency between the emission savings from additional measures calculated bottom up and top down, and calculating the emission reduced as result of policies and measures as a percentage of the projected emissions in each sector. Sections i, ii and iii present the results of the checks for total emissions. During the QA/QC procedure, the checks were performed each sector specifically. In instances where the checks indicated a Member State's estimate of savings appeared high or low the Member State was asked to reconsider the submission and provide a short explanation for how emission savings are expected to be achieved. It is not possible to infer an overall level of accuracy from the submitted figures. If the Member State confirmed the estimate as accurate then the submission was not amended. The results presented highlight the quantified emission savings which in particular should be treated with caution.

i. Alignment of top down and bottom up estimates

In theory, any difference between the projections scenarios, 'With Existing Measures' and 'With Additional Measures' can be attributed to the impact of the additional policies (top down estimate of additional measures). This should therefore be similar in magnitude to the emission savings of AM reported by Member States presented in this report (bottom up estimate of additional measures). Poland did not submit any bottom up savings from AM or WAM projections scenarios. Only Ireland, Italy, Luxembourg, and Spain reported emission savings from AM which are similar in magnitude (difference less than 20%) to the difference between the WEM and WAM projections scenarios.

Table B-2 Member States whose total emission savings from AM differ from the AM estimated based on their reported projections by more than 20 %

	2010	2015	2020
Austria	1	1	1
Belgium	1	1	1
Bulgaria	1	1	1
Cyprus	1	1	1
Czech Republic	0	0	1
Germany	1	0	0
Denmark	1	1	1
Estonia	1	1	1
Spain	0	0	0
Finland	1	1	1
France	1	1	1
United Kingdom	1	1	1
Greece	1	0	0
Hungary	1	1	1
Ireland	0	0	0
Italy	0	0	0
Lithuania	1	1	1
Luxembourg	0	0	0
Latvia	1	1	1
Malta	1	0	1
Netherlands	1	1	0
Poland	NA	NA	NA
Portugal	1	0	1
Romania	1	1	1
Sweden	0	1	1
Slovenia	1	1	1
Slovakia	1	1	1

Source: ETC/ACM 2011
Note: Crosses (x) indicate where the bottom up emission savings of AM was found to be inconsistent with the top down estimate. 'Zeros' indicate consistent data and 'NA' indicates where the check was not possible because no AM or WAM scenario was reported. The accuracy check was not performed on Denmark, Germany and Portugal's submissions.

In general, the bottom up emission saving estimates is lower than the top down estimate mainly as a result of incompleteness of the reported information of quantified emission savings. The highest difference was observed in Belgium's submission. In 2015, the top down estimate of AM reported by Belgium was almost 2,400 times higher than the bottom up estimate. As expected, the bottom up emission savings for those Member States with high completeness of the ex-ante emission savings for

all years tend to be more consistent with the top down estimate (Czech Republic, Greece, Ireland and Italy). Malta reported emission savings for all reported PAMs, but for 2020, the top down estimate is double the bottom up estimate. The bottom up and top down estimate is considered inconsistent for Cyprus, Slovenia and the United Kingdom because Cyprus does not report any bottom up AM estimates and the United Kingdom does not report WAM scenario projections.

Bottom up emission savings were higher than the top down estimate for four Member States. Lithuania's bottom up estimate was higher than the top down estimate for all years. Denmark's bottom up estimate in 2015 was double the estimate reported top down. The Netherlands's bottom up emission savings for 2015 was nearly 30% higher than the top down estimate. Communication with the Netherlands explained that this was because the bottom up PAMs information and reported projections were inconsistent. The projections include some new data for which bottom up data is unavailable. Sweden's bottom up estimate was higher than the bottom up estimate. Sweden reported emission savings from one AM[6] (Increased CO_2 tax for non ETS industry and introduction of energy tax on fossil fuels for heating in industry) in their submission. 200 kt CO_2-equivalent is projected to be saved from this policy in 2015 and 2020. The impact of AM from the top down methodology is 50 kt CO_2-equivalent and 100 kt CO_2-equivalent respectively. Sweden commented following the deadline for data finalisation that this policy is an EM and the AM which leads to 50 and 100 kt CO_2-equivalent was not included in the submission.

The Czech Republic reported negative emission savings from AM for 2010 but the top down estimate indicated that 192 kt CO_2-equivalent was saved from AM in 2010.

ii. Overestimates within a particular sector

This second check identified unusual or anomalous emission saving estimates of policies. Anomalous results were identified by comparing the sum of the emission savings against the relevant sectoral projections. This will identify if the savings represent a disproportionate amount of the sectoral emissions. Member States were contacted if the impact of EM policies were more than 20% of projected emissions in that sector. For the 'additional measures' scenario the threshold was raised to 25% and if policies in a given sector were contributing to savings of more than 25% clarifications were asked for. The summary results for total emission savings is presented below.

[6] The policy was reported as WEM but was specified as WAM in the additional information on status column in the reporting template.

Table B-3 Emission reduction (%) as a result of policy (EM and EM + AM)

	Emission reduction in WEM as a result of EM (%)			Emission reduction in WAM as a result of EM +AM (%)		
	2010	2015	2020	2010	2015	2020
Austria	3%	5%	8%	3%	10%	14%
Belgium	10%	15%	19%	10%	16%	20%
Bulgaria	12%	17%	19.5%	12%	18%	20%
Cyprus	5%	11%	34%	6%	15%	43%
Czech Republic	4%	9%	14%	4%	10%	15%
Germany	NA	NA	NA	NA	NA	NA
Denmark	NA	NA	NA	NA	NA	NA
Estonia	4%	8%	12%	4%	9%	14%
Spain	7%	10%	16%	7%	11%	17%
Finland	2%	7%	23%	2%	8%	26%
France	3%	9%	14%	3%	10%	16%
Greece	17%	22%	30%	17%	27%	36%
Hungary	10%	16%	27%	10%	17%	30%
Ireland	4%	6%	7%	4%	10%	15%
Italy	2%	7%	10%	2%	9%	21%
Lithuania	12%	13%	13%	12%	16%	23%
Luxembourg	0%	4%	4%	0%	7%	9%
Latvia	2%	3%	3%	2%	4%	4%
Malta	5%	7%	10%	4%	11%	25%
Netherlands	0%	4%	8%	0%	9%	19%
Poland	0%	0%	0%	0%	0%	0%
Portugal	NA	NA	NA	NA	NA	NA
Romania	52%	0%	0%	53%	0%	0%
Slovenia	3%	18%	23%	3%	20%	26%
Slovakia	4%	8%	16%	4%	9%	19%
Sweden	25%	29%	29%	25%	29%	29%
United Kingdom	7%	11%	15%	7%	15%	24%

Source: ETC/ACM 2011
Note: Red cells indicate where emission reduction from EM are higher than 20% of WEM projections and EM + AM higher than 25% of WAM projections.

The sum of emission reduction as a result of EM was higher than 20% of WEM projections for eight Member States (Cyprus, Finland, Greece, Hungary, Malta, Romania, Slovenia and Sweden). In particular, PAMs implemented in Romania is expected to reduce emissions by 52% in 2010. Romania only reported quantified emission savings for one policy, the 'EU-Emission trading scheme', which is expected to have saved 205,410 kt CO_2-equivalent in 2010. The projected emission saving for this policy is bigger than the projected emissions in Romania in 2010 and thus considered too high and has been omitted from this report.

Emission savings from the policy, 'Natural gas', is the dominant policy in Cyprus expected to reduce emissions by 17% in 2020. The policy reduces emissions in Cyprus by shifting fuel use to natural gas.

No emission savings are expected from the policy in 2010 and 2015. In addition, emission savings from 'Methane recovery from existing and new waste management sites' is expected to reduce Cyprus' waste sector emissions by 60% in 2020. Due to the large reduction in emissions expected from these two policies in Cyprus, the reported emission savings should be used with caution. The same is true for the key policies with high emission savings reported by the other five Member States.

iii. Large revisions since 2009

Eighteen Member States were contacted because when a policy-level matching exercise was conducted between Member State's 2009 submission and the 2011 submission indicated differences of more than 100%. Three Member State's submissions were amended.

g. Conclusions

The Quality assurance/quality control (QA/QC) procedure identified a number of issues in Member State submissions and allowed the quality and completeness of reporting to be improved in the majority of Member States. The quality of the reported information on PAMs in 2011 for each TCCCA is as follows:

Timeliness - Nine Member States provided submissions before the deadline, three Member States resubmitted their 2009 submission however all other Member States provided late submissions.

Transparency - Just 20% of total reported policies included a reference for the source of emission estimates. Sixteen Member States did not report this information at all. However, this element of reporting was not a mandatory part of the submission.

Completeness – The completeness of the mandatory qualitative information was high. Information on the EU policy addressed/ related to the PAM, policy interaction and indicator to monitor the progress of the PAM was the least complete, reported for all PAMs by only 16, six and four Member States respectively. Only six Member States (Cyprus, Czech Republic, Greece, Ireland, Italy and Malta) were able to fully report mandatory quantitative information. The completeness of the emission savings in 2020 was higher than savings in 2010. The completeness of the recommended qualitative information varied across the different information requested. Brief description of the policy was reported for over 80% of reported PAMs but only completed for all PAMs by nine Member States (Belgium, Bulgaria, Denmark, Finland, Hungary, Luxembourg, Latvia, Portugal and the United Kingdom). Whereas, the non-GHG mitigation benefit was reported only for just over 10% of the reported PAMs and no Member States completed the information for all PAMs reported. The completeness of the recommended quantitative information is very low. Ex-post emission reduction estimates were only reported by Romania, Finland, the United Kingdom, Belgium, Austria and France and only for 64 PAMs. Information on cost of emission mitigation is only reported for 28 PAMs (by Czech Republic, Denmark, Finland, France, Lithuania, Spain and the United Kingdom).

Comparability - 19 Member States used the recommended reporting template however, use of notation keys were not consistent across submissions. Currently, there is no agreed methodology for calculating ex-ante, ex-post emissions savings or the cost of emission mitigation. As a result, the comparability of the quantitative information is low. For the qualitative information, UNFCCC guidelines to be followed by Member States exist to increase comparability of the information. But, these guidelines lack detail. Thus, although comparability of the submission has increased since 2009,

many comparability issues remain, further work needs to done to harmonise the information to be reported to improve the comparability.

Consistency - Seven Member States had unresolved inconsistencies within their reported information. Emission savings split by ETS and non ETS were consistent with the total emission savings apart from one policy reported by Slovakia.

Accuracy - Only Ireland, Italy, Luxembourg and Spain reported emission savings from AM which are similar in magnitude (difference less than 20%) to the difference between the WEM and WAM projections scenarios for all years. For the majority of Member States, the bottom up emission saving estimates is lower than the top down estimate as a result of incompleteness of the reported information of quantified emission savings.

Eight Member States (Cyprus, Finland, Greece, Hungary, Malta, Romania, Slovenia and Sweden) project that EM will reduce emissions by more than 20% in the WEM scenario in at least one projected year (or EM + AM is expected to reduce emissions by more than 25% in the WAM scenario). The emission saving estimate for 'EU-Emission trading scheme' reported by Romania has been omitted since the emission saving from this single policy is of similar magnitude to the projected emission reported by Romania for 2010. For other Member States, key policies with high emission savings should be used for further analysis with caution.

The robustness of the information reported under the MM Decision in future years will depend on the quality of submissions. The quality may be improved by providing more focussed guidance for Member States on, how to produce the emission-saving estimates and, the level of detail which should be provided for the each of the information to be reported. Also it is important to emphasise the importance of correctly assigning national policies to CCPMs, consistent use of notations and timeliness of submissions

C. Practical implementation of the QA/QC procedure

This Annex provides comment on the implementation of the QA/QC procedure performed on the Member States submissions by the ETC-ACM. Wherever possible, suggested improvements for the information which should be provided to Member States ahead of the submission deadline and for the QA/QC procedure are stated.

a. Response rate of Member States

During the QA/QC procedure, if there are any incomplete data, internal inconsistency and comparability issues and ex-ante emission savings which fell outside the set criteria, questions and clarifications are requested from the Member States. Thus the QA/QC procedure relies on Member States to respond to the checks performed. This was the first year the review of the information was performed which required input from the Member States and the response rate from the Member States was a limitation in the process. During the communication procedure, Member States were able to respond to some requests made by the ETC-ACM but almost always not all. Many errors were identified by the reviewers but remained unresolved due to a lack of response from the Member States. Table C-1 shows the Member States that responded to the different stages of the QA/QC procedure in a timely manner.

Table C-1 Member States' response rate to the completeness, consistency and accuracy check

	Completeness check	Consistency check	Accuracy check
Austria	Yes	Yes	No
Belgium	Yes	Yes	Yes
Bulgaria	Yes	Yes	Yes
Cyprus	Yes	No	No
Czech Republic	Yes	Yes	Yes
Denmark	N/A	N/A	NA
Estonia	Yes	Yes	Yes
Finland	No	Yes	Yes
France	No	No	Yes
Germany	N/A	N/A	NA
Greece	Yes	Yes	Yes
Hungary	Yes	Yes	Yes
Ireland	Yes	Yes	Yes
Italy	Yes	Yes	Yes
Latvia	Yes	Yes	Yes
Lithuania	No	No	No
Luxembourg	Yes	Yes	Yes
Malta	Yes	No	Yes
Netherlands	Yes	Yes	Yes
Poland	Yes	No	Yes
Portugal	N/A	N/A	NA
Romania	Yes	Yes	No
Slovakia	Yes	Yes	No
Slovenia	No	No	Yes
Spain	Yes	Yes	No
Sweden	Yes	No	No
United Kingdom	Yes	Yes	Yes

Source: ETC/ACM 2011

It is important to distinguish those Member States who were very cooperative during the communication procedure because for these Member States, the completeness, consistency and accuracy of the submission improved significantly between the initial submission and the final dataset used in this report. Timely and complete responses from Member States has been crucial in the implementation of the QA/QC procedure and in future reporting rounds, more emphasis needs to be placed on the need of Member State cooperation.

The high number of back-and-forth communications clearly increases the administrative burden on the Member States and reviewers. In future years, it would be advisable to try to reduce this number as much as possible. This could be achieved by combining separate requests for information, or by ensuring that guidelines and templates are made available to the Member States in a timely manner and emphasising the importance of using these tools more.

The QA/QC procedure was not performed on submissions which were not updated in 2011.

b. Completeness

In the first communication all Member States were asked to improve the completeness of their reporting. The reporting template was designed to highlight the precise cells where information was missing so Member States could directly see which cells lacked information. The reporting template is the required format for the QA/QC procedure; therefore any non-standardised submissions had to be transposed into the template by the reviewer. The reviewers found that this check improved the completeness 15 Member State submissions.

c. Consistency

Member States were requested to distinguish the difference between zeros reported because no emission saving estimate was available and zero emissions expected to be saved as a result of the policy. However, as a result of the non-response by Member States, this inconsistency still exists. To overcome this issue, a lexicon of common notation could be circulated with the reporting guidelines in future years in order to ensure common understanding between Member States.

The internal consistency checks mainly picked up human errors in the reporting process. In many cases, the corrections were un-contentious; errors were corrected by the reviewer, and approved by the Member States. Minor issues such as spelling and grammar were corrected by the reviewers without approval from Member States but no other major changes were made by the reviewer without approval by the Member State.

The reviewers reported that consistency had noticeably improved in 14 Member States due to the QA/QC procedure. However, there were seven Member States in which issues remained unresolved. This was mainly due to receiving no reply from the Member States concerned.

d. Accuracy

All Member States who submitted information on policies and measures in 2011 were contacted to confirm the accuracy of particular quantitative estimates for particular policies, which fell outside the criteria set under the QA/QC procedure. Of these, 17 Member States responded and eight submissions (32%) were amended.

It is not possible to infer an overall level of accuracy from these figures because if the reported estimate was considered high based on the checks but if the Member State confirmed this estimate as accurate then the submission was not amended. This submission is, therefore, considered accurate by the Member State. Some of the 'amended' submissions were not amendments to the quantitative estimates, but a revision of the sector affected by the policy. Errors in the sector selection led the reviewer to question the total emissions savings for a sector.