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Greenhouse gas emission trends and projections in Europe 2011

Tracking progress towards Kyoto and 2020 targets

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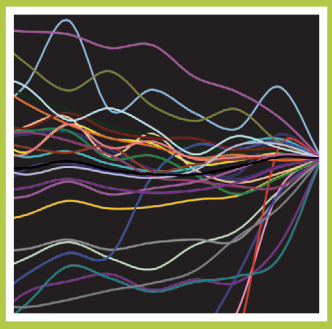

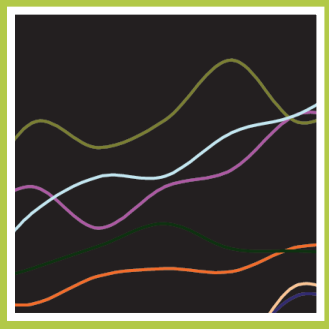

European Environment Agency

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Acknowledgements

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Executive summary

At the end of 2010, the EU-15 was on track to achieve its Kyoto target but three EU-15 Member States (Austria, Italy and Luxembourg) were not on track to meet their burden-sharing targets. These countries must therefore seriously consider further action to ensure compliance, in particular revising their plans on using flexible mechanisms. Among the EEA member countries outside the EU, Liechtenstein and Switzerland were not on track to achieve their Kyoto target at the end of 2009 ([1]). All other European countries are on track to meet their targets, either based on domestic emissions only or with the assistance of Kyoto mechanisms.

The economic recession had a significant impact on the EU's total greenhouse gas (GHG) emission trends but a more limited effect on progress towards Kyoto targets. This is because emissions in the sectors covered by the EU Emissions Trading Scheme (ETS), which were most affected by the crisis, do not affect Kyoto compliance once ETS caps have been set.

With existing national measures, Member States do not project enough emission reductions for the EU to meet its unilateral 20 % reduction commitment in 2020. Additional measures currently planned by Member States will help further reduce emissions but will be insufficient to achieve the important emission cuts needed in the longer term. By 2020 Member States must enhance their efforts to reduce emissions in non-EU ETS sectors, such as the residential, transport or agriculture sectors, where legally binding national targets have been set under the EU's 2009 climate and energy package.

This report presents an overview of the progress made by the EU, its Member States and other EEA member countries towards their GHG emission targets. It first assesses current progress towards targets under the Kyoto Protocol (KP), mainly based on historic GHG emissions data for the first three years of the KP's five-year first commitment period (2008–2012). The following chapter summarises information related to the EU ETS. Then, based on projections reported by the countries themselves, the report assesses projected emission levels against the EU objective of reducing GHG emission levels by 20 % compared to 1990 levels by 2020 ([2]). Finally, it looks at the progress of Member States towards their national targets for 2020 set under the EU's Effort Sharing Decision (406/2009/EU), based on projected emissions in non-EU ETS sectors.

At the end of 2010, the EU-15 was on track to achieve its Kyoto target. The economic recession in the EU affected total GHG emission trends more than it affected actual progress towards the Kyoto targets.

Twenty-five EU Member States (all except Cyprus and Malta), Croatia, Iceland, Liechtenstein, Norway and Switzerland have individual GHG reduction and limitation targets under the KP. The EU-15 also has a common 8 % reduction target compared to base-year levels, to be achieved collectively by the 15 pre-2004 EU Member States (the EU-15) under the 'burden-sharing agreement'. These targets represent averages to be achieved during the Kyoto Protocol's first commitment period (2008–2012).

After three years of this commitment period, the EU-15 was on track to achieve its target. Its average 2008–2010 emissions were lower than its target by 198 Mega (million) tonnes (Mt) carbon dioxide (CO_2) equivalent per year, representing 4.7 % of

([1]) The government of Switzerland decided in June 2011 to increase its use of flexible mechanisms to meet the Kyoto target.
([2]) The EU has further committed to increase its emissions reduction target to 30 % on two conditions: that other industrialised nations commit to making comparable cuts, and that the more advanced developing countries agree to make an adequate contribution to the global effort.

base-year emissions. Of these, 1.2 percentage points (51 Mt CO_2- equivalent) correspond to domestic emission cuts, with the remainder comprising the expected net GHG reductions deriving from land use, land use change and forestry (LULUCF) activities (0.9 percentage points) and planned use of the Kyoto Protocol's flexible mechanisms by several national governments (2.5 percentage points) over the full commitment period.

When national projections for the rest of the first commitment period are also considered, the EU-15 is expected to over-achieve its Kyoto target by an amount equivalent to 4.6–5.1 % of base-year emissions, depending on whether the expected effects of additional measures are realised by 2012. GHG emissions from non-ETS sectors are projected to account for 1.2–1.6 percentage points of this overachievement, averaging a level 50–69 Mt CO_2-equivalent below their target each year.

All these results take into account the impact of the EU ETS on each country's efforts to achieve its Kyoto target. Once emission caps have been set under the EU ETS, emission levels in the ETS sectors are fixed and annual fluctuations do not influence a Member State's progress towards its Kyoto target. Consequently, although the economic crisis led to very large reductions of total GHG emissions in 2009 across Europe, its influence on the progress of Member States and the EU-15 towards their respective Kyoto targets was much more limited because emission reductions in the sectors not covered by the EU ETS were not as large as overall reductions.

These results also take into account the surplus Kyoto units resulting from target overdelivery currently observed or projected in 12 EU-15 Member States. These surpluses significantly exceed the shortfall observed in the three Member States currently falling short of their burden-sharing target (Austria, Italy and Luxembourg). However, there is no guarantee that Member States with surpluses will make them available to the EU-15 to cover other Member State shortfalls. As such, if any Member State fails to comply with its burden-sharing target by the end of the commitment period then it would imply a significant risk that the EU-15 would also fail to achieve its target. Austria, Italy and Luxembourg must therefore further reduce emissions by 2012 or plan to increase their use of flexible mechanisms and ensure appropriate budgets are in place to this end. If the projected overdelivery of Member States was not taken into account (i.e. no surplus assigned amount units (AAUs) were available for EU-15 compliance) and no further action was taken by these three countries, the EU-15 could miss its target by 8–16 Mt CO_2-equivalent (current), which represents 0.2–0.4 % of EU-15 base-year emissions. This represents the sum of the shortfalls projected for those three Member States.

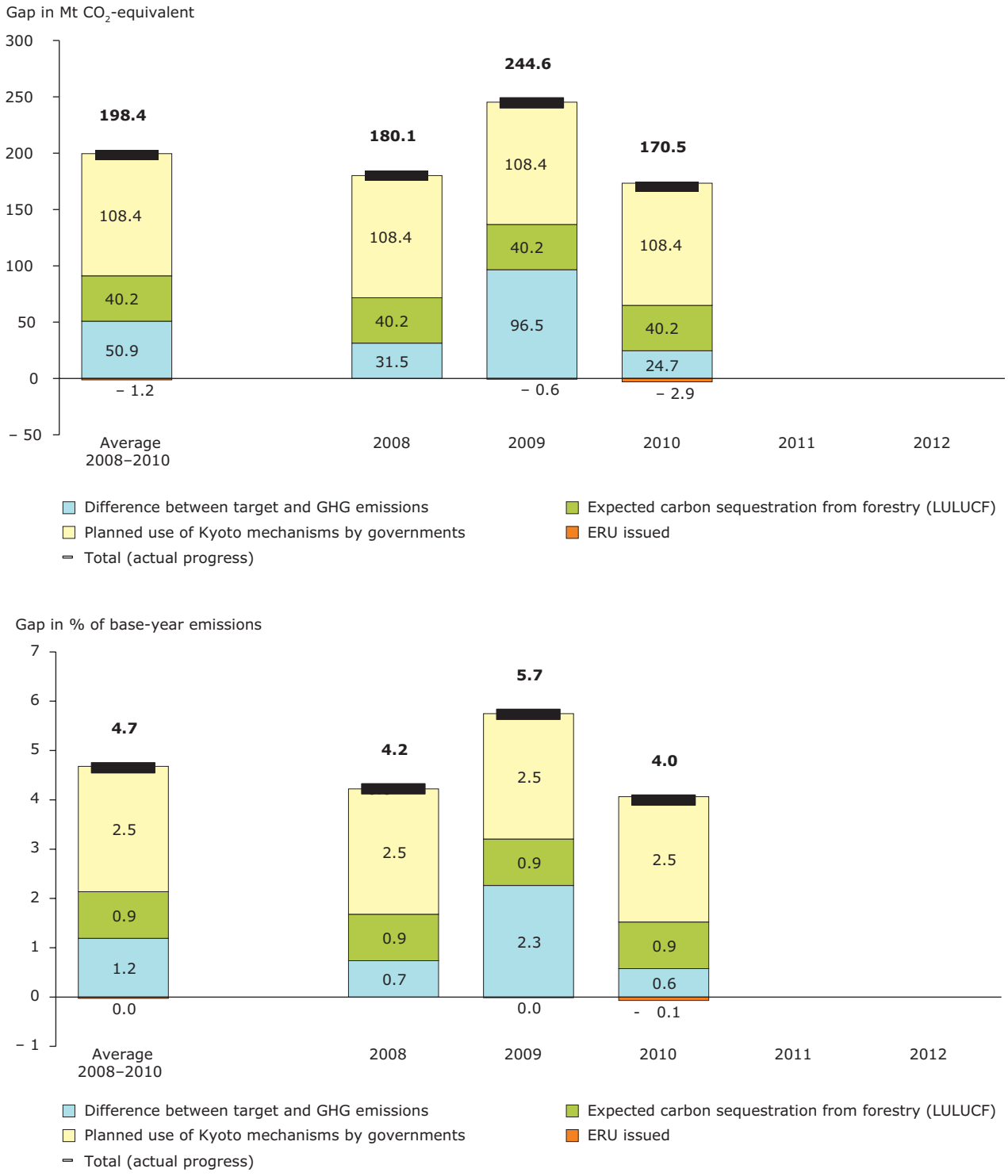
Three EU-15 Member States (Austria, Italy and Luxembourg) were not on track to achieve their Kyoto targets at the end of 2010. Two EEA member countries which are not part of the EU (Liechtenstein and Switzerland) were also not on track to meet their targets at the end of 2009 ([3]). All these countries must seriously consider further action to ensure compliance, in particular by increasing their use of flexible mechanisms, and ensure sufficient budgets to that end ([4]). All other European countries are on track to achieve their targets, either based on domestic emissions only or including expected effects of carbon sinks and Kyoto mechanisms.

When looking at the individual situation of Member States, three EU Member States (Austria, Italy and Luxembourg) were not on track to achieve their burden-sharing targets at the end of 2010. Two other EEA member countries (Liechtenstein and Switzerland) were in the same position at the end of 2009. These countries must further reduce emissions by 2012 or plan to increase their Kyoto units (for example through the use of flexible mechanisms) in order to achieve their respective Kyoto targets ([5]). Whatever option these countries decide to follow, adequate budgetary provisions will be needed to ensure that they meet their commitments. The current situation of Austria, Italy and Luxembourg is jeopardising the whole EU-15 effort to achieve its common commitment under the Kyoto Protocol, although in the case of Luxembourg the gap is small in both absolute and relative terms.

Based on their domestic emission levels only, six EU-15 Member States (Germany, Greece, France, Finland, Sweden and the United Kingdom) and nine of the ten EU-12 Member States with a Kyoto target (Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Romania and Slovakia),

([3]) No GHG emission data for 2010 are available for EEA member countries outside the EU, except for Norway. Therefore the assessment of current progress is based on the 2008–2009 average GHG emissions, rather than on the 2008–2010 average used for the EU-27 Member States and Norway.
([4]) See note 1, page 8.
([5]) See note 1, page 8.

Figure ES.1 Actual progress of the EU-15 towards its burden-sharing target in absolute and relative terms



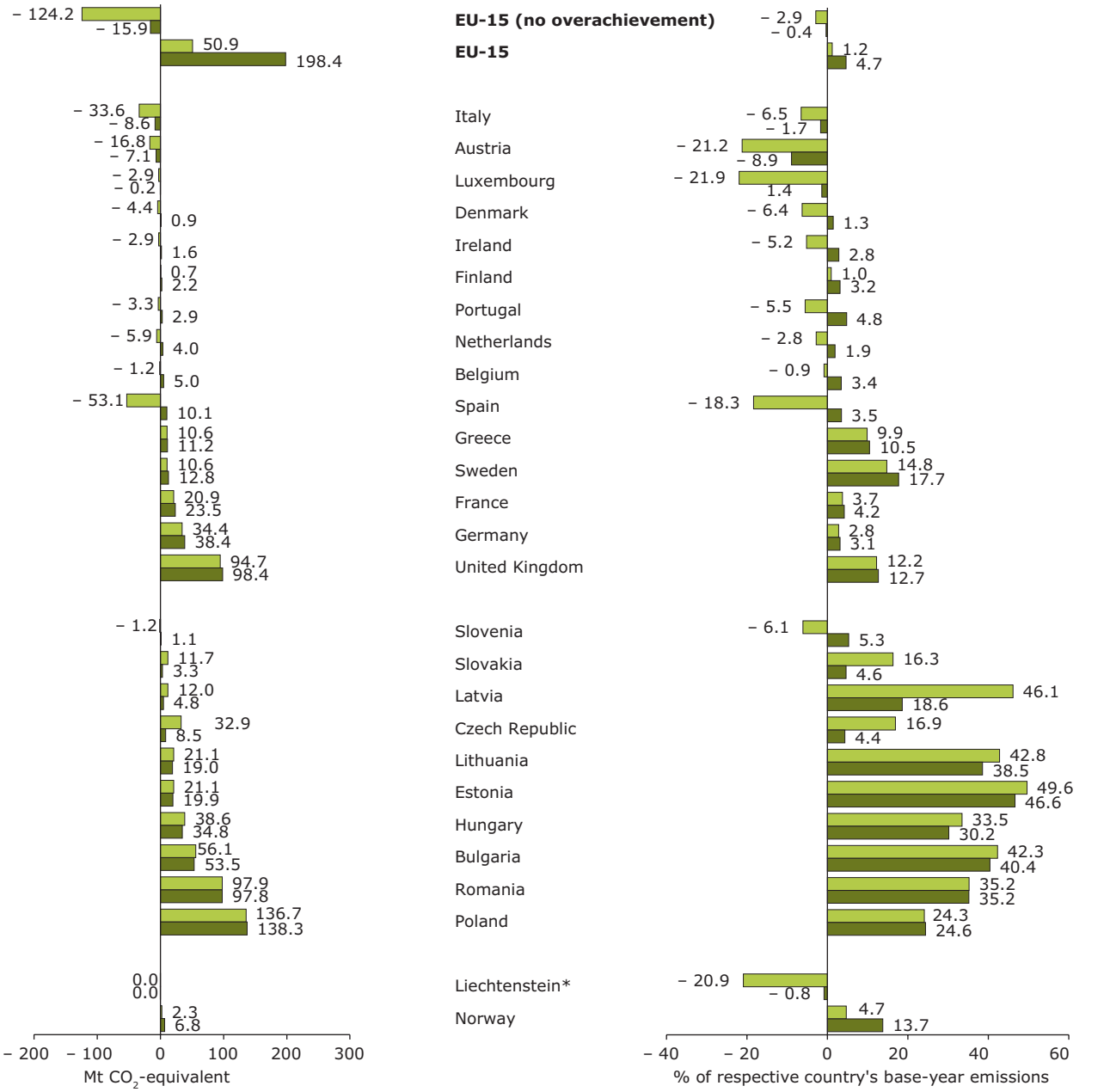
Note: The X-axis (0 % line) corresponds to achieving the EU-15 reduction target under the Kyoto Protocol (– 8 % compared to base-year emissions).

Positive values correspond to contributions to achieving the EU-15 Kyoto target, while negative values represent shortfalls.

The difference between target and GHG emissions concerns the sectors not covered by the EU ETS, which represent the correct emissions and target to consider for the assessment of progress towards Kyoto targets in the EU.

Source: EEA, 2011a; EEA, 2011b; EEA, 2011d; EEA, 2011e.

Figure ES.2 Gap between average 2008–2010 emissions and Kyoto targets in sectors not covered by the EU ETS



Note: * Liechtenstein: the gap refers to the average 2008–2009 non-ETS emissions because no approximated 2010 GHG emissions are available. Croatia, Iceland and Switzerland are not included as for these EEA member countries it is currently not possible to calculate non-ETS emissions.

Subsequent to the allocation of allowances to the EU ETS, the target and annual emissions are those of the sectors not covered by the EU ETS. The assessment is based on average 2008–2010 emissions, planned use of flexible mechanisms and the expected effect of LULUCF activities. A positive value indicates a country whose average 2008–2010 emissions were lower than the annual target (overachievement). A negative value indicates a shortfall.

EU-15 values are the sum of the gaps/surplus' for the 15 EU Member States which are part of the burden-sharing agreement. 'EU-15 (no overachievement)' corresponds to the situation of the EU-15 where all surplus AAUs from target overachievement in the EU-15 are not taken into account, to reflect the possibility that Member States with a surplus could use any remaining allowances for their own purposes and not necessarily make them available to compensate for Member States with a shortfall.

Source: EEA, 2011a; EEA, 2011b; EEA, 2011d; EEA, 2011e.

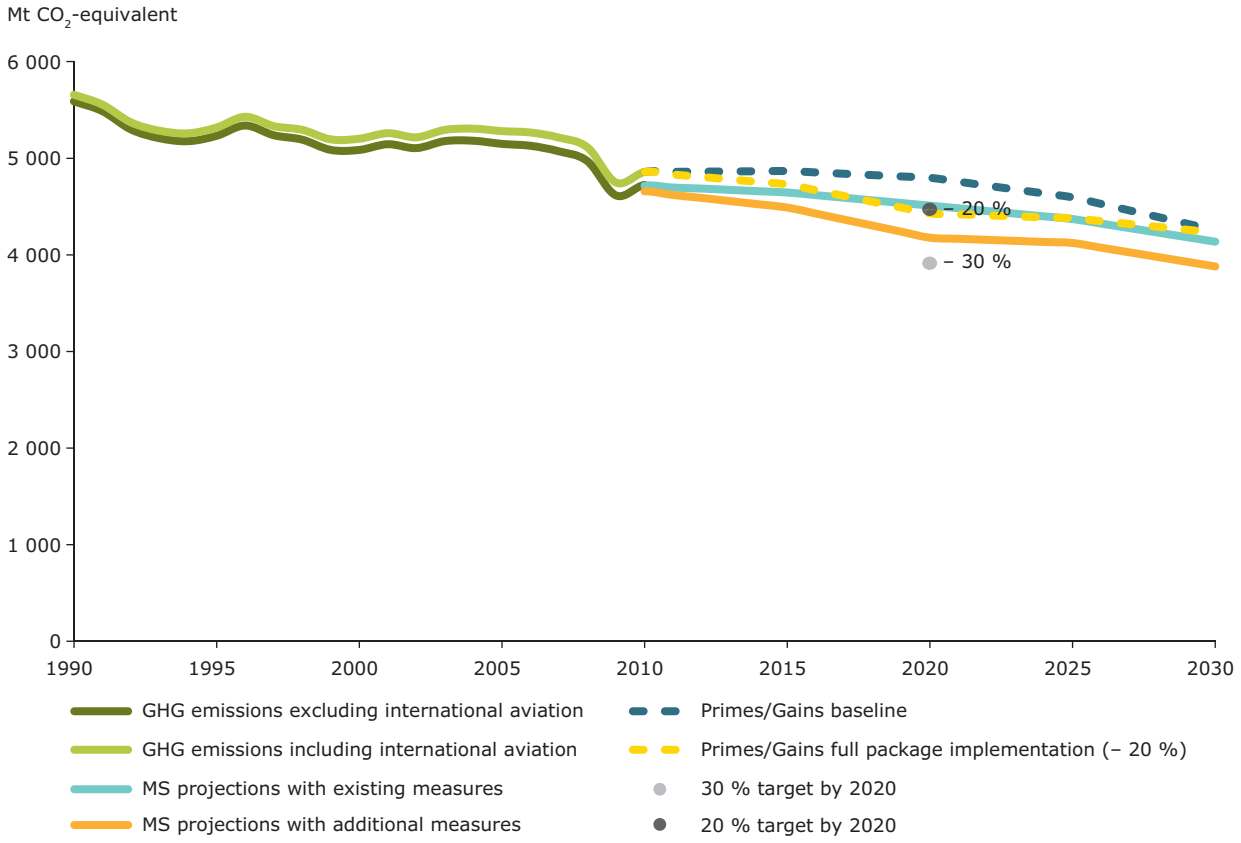
as well as the EEA member countries Iceland and Norway, were on track to meet their target at the end of 2010 (2009 in the case of Iceland).

When the intended use of flexible mechanisms and expected emission reductions from LULUCF activities over the full commitment period are taken into account, seven additional Member States (Belgium, Denmark, Ireland, Spain, the Netherlands, Portugal and Slovenia) are considered on track to meet their targets based on data for 2008–2010. For the period 2008–2009 one EEA member country (Croatia) would also be on track to meet its target.

With the current set of measures in place, Member States do not project sufficient emission reductions for the EU to meet its unilateral 20 % reduction commitment by 2020. Additional measures, currently planned by Member States, will help in achieving this target but will not be sufficient to achieve more drastic emission cuts in the long term.

Based on recent EEA estimates, after an important drop in 2009 due to the economic recession, total EU GHG emissions increased in 2010 and stood approximately 15.5 % below their 1990 levels (about 14 % if emissions from international aviation are taken into account). For the year 2010, emissions remained 5 % below 2008 levels. Projections from Member States indicate that total EU emissions will not be significantly reduced in the period up to 2020: with the current national domestic measures in place, EU emissions in 2020 will be 19 % below 1990 levels, which is just short of its 20 % reduction target. The gap of 1 percentage point could be filled and the target overachieved by 5 points if Member States implement all additional measures currently being planned, in particular in the transport and residential sectors.

Figure ES.3 Trends and projections of EU total GHG emissions

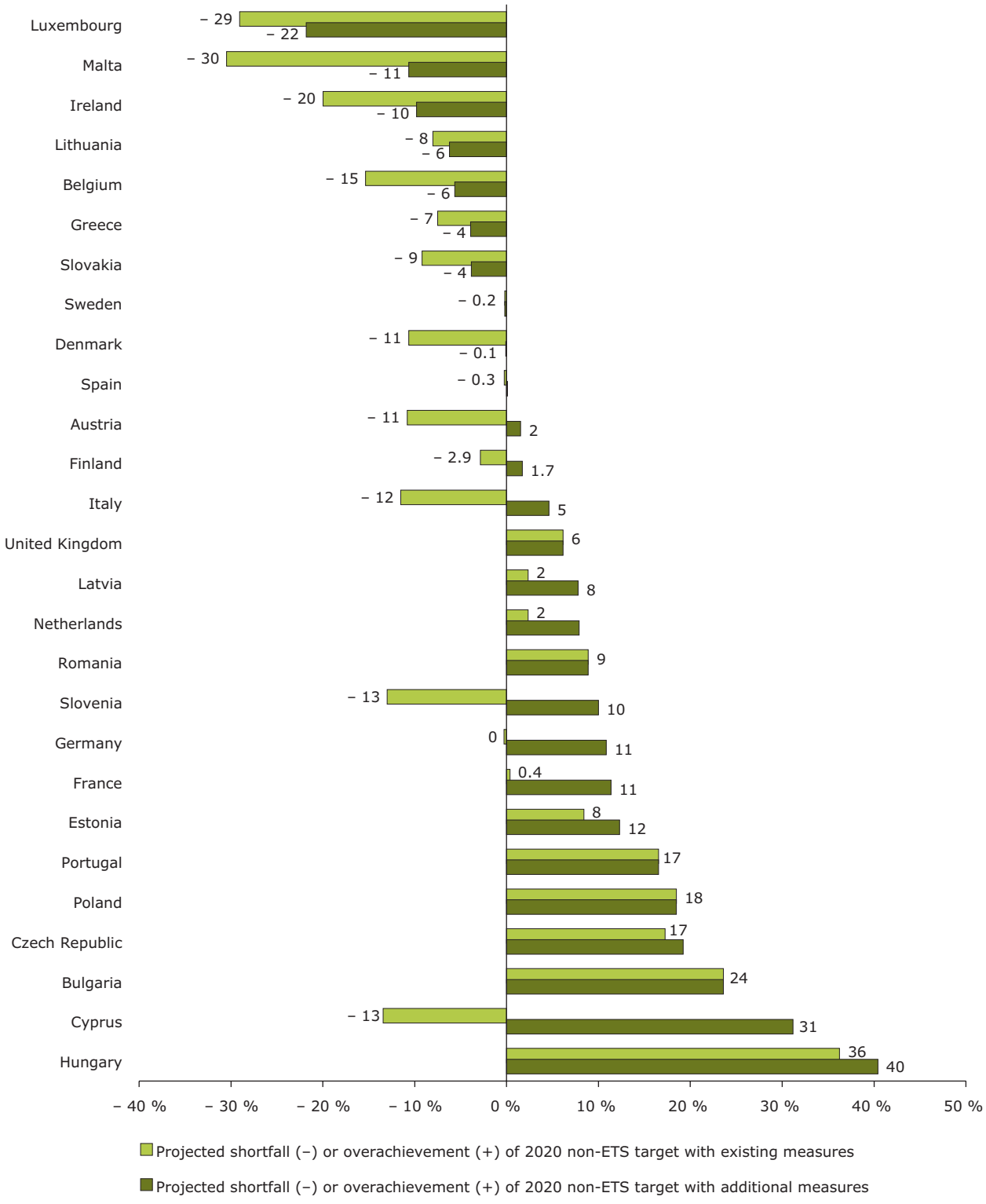


Note: Member State projections do not include emissions from international aviation. Such emissions are included in the Primes-Gains scenarios.

2025 and 2030 projections based on information provided by 12 Member States. For other Member States, 2030 projections were gap filled using the 2020–2025 and 2020–2030 relative trends available from the Commission's scenarios based on the Primes and Gains models.

Source: EEA, 2011a; European Commission, 2011.

Figure ES.4 Projected gaps between 2020 GHG emissions and national targets in the sectors not covered by the EU ETS



Note: Based on preliminary estimates and calculations by EEA. Data may change in 2012 pending on the publication of 2012 GHG emission inventories and on further comments from Member States concerning ETS scope corrections. Progress calculated based on domestic emissions only, without accounting for possible use of flexibilities. Relative gaps estimated by dividing the difference between projected non-ETS 2020 emissions and estimates of 2020 targets under the Effort Sharing Decision by EEA estimates of 2005 non-ETS emissions (for a scope consistent with the 2013–2020 period, i.e. taking into account the changes in scope of the EU ETS, in particular installations opted out in 2005 and included in the ETS in 2008–2012, and the extension of the ETS scope from 2013 onwards).

Source: EEA, 2011a; European Commission, 2011.

Looking beyond 2020, partial information from Member States indicates that existing and currently planned measures are likely to be insufficient to bring the EU onto a pathway to achieving long-term emission reduction objectives. In particular, achieving a reduction of emissions by 80–95 % by 2050 compared to 1990, as agreed by European Heads of State and governments, will require enhanced efforts from Member States. For example, aggregated projections for 2030 indicate an approximate emission reduction of 30 % compared to 1990, while cost-effective emission reductions consistent with the long-term target would be in the region of 40 %.

By 2020, Member States need to enhance their efforts to reduce emissions specifically in the sectors not covered by the EU ETS, where national targets have been set under the 2009 climate and energy package. For 10 Member States, projected gaps between emissions and targets persist even if planned additional measures are taken into account.

At national level, projections show that 11 Member States (Bulgaria, the Czech Republic, Estonia, France, Latvia, Hungary, the Netherlands, Poland, Portugal, Romania and the United Kingdom) could achieve their individual 2020 target in the sectors not covered by the EU ETS with the current set of domestic policies and measures, while seven Member States (Austria, Cyprus, Finland, Italy, Germany, Slovenia and Spain) would achieve their targets through implementation of additional measures. The remaining nine Member States (Belgium, Denmark, Ireland, Greece, Lithuania, Luxembourg, Malta, Slovakia and Sweden) would not achieve their targets through domestic emission reductions only, even if currently planned measures are implemented. However, Member States could still meet their national 2020 targets even if their non-ETS emissions in 2020 are higher than their national targets through the use of flexibilities. In the period 2013–2020, Member States can carry over the difference between their annual emission allocation and actual GHG emissions for use in subsequent years.

1 Introduction

1.1 Objective and scope

This report presents an assessment of the progress projected or achieved by the EU and European countries towards achieving their GHG emission targets under the KP and for 2020. It also presents a compilation of 'greenhouse gas profiles' for the EU, each EEA member country and Croatia.

The report supports and complements the annual report of the European Commission to the European Parliament and the Council on progress of the EU and its Member States towards their targets, as required by Article 5 of Decision 280/2004/EC of the European Parliament and of the Council concerning a mechanism for monitoring Community GHG emissions and for implementing the KP (the EU Monitoring Mechanism Decision).

The report covers the geographical area represented by the 32 EEA member countries. Unless otherwise noted, the acronym EU is used to represent the European Union as constituted of its 27 Member States (EU-27). The assessment of progress towards Kyoto targets looks in detail at the situations of:

- the EU as constituted by the 15 pre-2004 Member States (EU-15) which has an overall 8 % reduction commitment under the KP;
- the 25 EU Member States with a Kyoto target;
- two EU candidate countries (Iceland and Croatia) ([6]);
- the three other EEA member countries with a Kyoto target (Liechtenstein, Norway and Switzerland).

Cyprus, Malta and Turkey, all EEA member countries, do not have a target under the KP and are therefore not covered by the assessment of progress towards Kyoto targets. Non-EU Member States are not covered in the 2020 target assessment.

Progress towards GHG emission targets is assessed in two different ways, depending on the time frame considered.

- The progress of Member States towards their Kyoto (or burden-sharing) targets is assessed primarily on the basis of their historic emissions during the first three years (2008, 2009 and 2010) of the KP's first commitment period. For the EU-15, an assessment of the expected progress for the whole commitment period (2008–2012) is also presented, underpinned by aggregated emission projections from Member States for the remaining years of the commitment period (2011–2012).
- The progress of Member States towards their 2020 targets is based on projections of emissions until 2020 submitted by Member States in 2011. These Member States estimates are reported for two scenarios, which differ by the assumptions taken concerning implementation of existing measures only ('with existing measures') or implementation of additional planned measures ('with additional measures').

The assessment of current progress (for Kyoto targets) provides an indication of where all countries were standing at the end of 2010 with respect to their 2008–2012 average targets. It does not aim to predict whether a country will finally comply with its commitment or not. This approach based mainly on robust historic data avoids relying on more uncertain projection data. It provides policymakers a clear picture of where countries stand at the end of 2010 and thus an indication of the further efforts required to achieve Kyoto objectives by the end of 2012. As regards the emission budgets (AAUs) against which actual emissions are compared to assess progress, the average use of flexible mechanisms and the carbon removals due to LULUCF activities as planned by

([6]) Iceland applied to join the European Union on 16 July 2009. Negotiations on Iceland's accession to the EU were opened on 27 June 2011. In June 2011, the EU closed accession negotiations with Croatia (which is not an EEA member country either). If the indicative date of 1 July 2013 as proposed by the Commission is retained by the Council, Croatia is expected to join the EU as the 28th Member State at that time. Accession negotiations have not been opened yet for the former Yugoslav Republic of Macedonia.

Member States for the whole commitment period (instead of 2008–2010 only) have been taken into account as they are assumed to represent better estimates of final national emission budgets than if annual historic data was considered. For the EU-15, the 25 EU Member States with a Kyoto target and Norway, the assessment of current progress is based on their official GHG inventory submissions to the United Nations Framework Convention on Climate Change (UNFCCC) in 2011, providing GHG data for the years 2008 and 2009, and on early estimates of 2010 GHG emissions. For Croatia, Iceland, Liechtenstein and Switzerland, the assessment is based on 2008–2009 average as no estimates of 2010 emissions were available.

The assessment of the projected progress of the EU-15 towards its 8 % reduction target provides an indication of where emissions of the EU-15 are expected to be standing by the end of the KP's first commitment period, in 2012, compared with its emission target. This allows in particular for accounting of projected emission trends following the economic recession.

The assessment of the projected progress of the EU compared to its 20 % reduction target by 2020 is based mostly on projections required to be submitted by Member States in 2011 under Article 3.2 of the EU Monitoring Mechanism Decision and its implementing provisions ([7]).

In addition, based on projection data concerning emissions not covered by the EU ETS submitted by Member States on a voluntary basis, an assessment is also made of the projected progress of Member States towards their national 2020 targets set under the Effort Sharing Decision (as part of the 2009 EU climate and energy package). These targets concern all GHG emissions which are not covered by the EU ETS, such as emissions from transport, agriculture, waste or residential fuel combustion.

1.2 Data sources

Overall, the data and analyses presented in this report are based on:

- national GHG inventory submissions under the KP, covering the period 1990–2009 ([8]);
- approximated 2010 GHG emissions (early estimates). When available, the estimates provided by Member States were used (Austria, Denmark, Germany, Italy, Luxembourg, the Netherlands, Norway, Poland, Spain and the United Kingdom). For all other EU Member States, estimates prepared by the EEA were used;
- GHG projections submitted under the EU Monitoring Mechanism, covering the period 2010–2020 ([9]);
- data from the Community Independent Transaction Log (CITL): verified emissions under the EU ETS, national allocation plans (NAPs) and the subsequent European Commission decisions;
- information on expected CO_2 removals from carbon sequestration activities (LULUCF) as provided by Member States;
- information on the intended use of the Kyoto flexible mechanisms at government level as provided by Member States;
- where necessary, projections of GHG emissions from the European Commission based on Primes/Gains models.

1.3 Quality of reported information

The EU Member States covered by this report are subject to two main reporting requirements concerning GHG emissions. Each year, they must submit their annual GHG inventory (for the period from 1990 until the year Y – 2) under a UNFCCC reporting requirement and the EU Monitoring Mechanism. In addition, under the EU Monitoring Mechanism, EU Member States must submit biennially — in odd years — to the European Commission new information on GHG projections and national programmes as well as on indicators to monitor and evaluate progress with policies and measures.

By June 2011, all the countries covered by this report had reported their GHG inventory for the period 1990–2009. Twenty-five Member States had submitted updated GHG projections data (all except Portugal and Romania) as well as Norway and Switzerland. The reported projections were subsequently reviewed and compiled by the European Topic Centre for Air pollution and Climate change Mitigation (ETC/ACM) of the EEA. Updated information on the use of flexible mechanisms and carbon sinks for the Kyoto period was also provided by 24 Member States as well as Norway.

([7]) Commission Decision 2005/166/EC.
([8]) This includes the LULUCF tables submitted under the Kyoto Protocol and the Standard Electronic Format (SEF).
([9]) Member States were recommended to report 2025 and 2030 projections in their biennial reporting under the EU Monitoring Mechanism. Where data was available this has been used in this report.

The assessment of projected progress of the EU towards achieving its Kyoto and 2020 targets was made predominately on the basis of updated national projections reported by Member States. Projections from the European Commission's baseline and reference scenarios, based on the Primes and Gains models ([10]) were used for those Member States that did not submit updated projections or where inconsistencies in the reported data were unresolved during the QA/QC procedure.

Not all Member States specified if their projections were taking into account the impact of the economic recession and of the measures included in the 2009 climate and energy package, in particular the change in scope in Phase III of the EU ETS and the binding national targets on renewable energy sources (see Table 1.1). The effect of the economic recession has been taken into account by all 21 Member States which provided information on this issue.

Based on the outcome of quality checks on transparency, completeness, comparability, consistency and accuracy, projections reported by Member States were gap filled if necessary or adjusted by the EEA, in agreement with the countries concerned.

Table 1.1 Accounting of key factors in the projections reported by Member States

Member State	Accounting of the economic recession	Accounting of climate and energy package	Accounting of change in EU ETS scope 2013	Gap filling of projections by EEA	Gap filling of non-ETS projections by EEA	Adjustment of sectoral projections by EEA
Austria	Yes	Yes	n.r.	No	No	Yes
Belgium	Yes	Yes		No	No	No
Bulgaria	Yes	n.r.	No	Yes	Yes	n.a.
Cyprus	Yes	Yes	No	No	No	Yes
Czech Republic	Yes	Yes	Yes	No	Yes	No
Denmark	Yes	Yes	Yes	No	No	No
Estonia	Yes	Yes	No	No	Yes	Yes
Finland	Yes	Yes	Yes	No	Yes	No
France	Yes	Yes	Yes	No	No	No
Germany	Yes	Yes	Yes	No	No	Yes
Greece	Yes	Yes	Yes	No	No	No
Hungary	n.r.	n.r.	n.r.	No	No	Yes
Ireland	Yes	Yes	No	No	No	No
Italy	Yes	Yes	Yes	No	No	No
Latvia	n.r.	n.r.	n.r.	No	No	Yes
Lithuania	Yes	No	No	No	Yes	Yes
Luxembourg	Yes	No	No	No	No	No
Malta	n.r.	No	n.r.	No	No	Yes
Netherlands	Yes	Yes	n.r.	No	Yes	Yes
Poland	Yes	No	No	No	Yes	No
Portugal	No	No	No	Yes	Yes	n.a.
Romania	No	No	No	Yes	Yes	n.a.
Slovakia	Yes	Yes	No	No	No	Yes
Slovenia	Yes	No	No	No	No	No
Spain	Yes	Yes	Yes	No	No	No
Sweden	Yes	Yes	Yes	No	No	No
United Kingdom	Yes	Yes	Yes	No	No	Yes

Note: n.r.: information not reported by the country or not available.
n.a.: not applicable, since projections were already gap filled.
Gap filling of projections based on Primes/Gains models. Adjustment of projections based on the ratio between historic emissions reported with projections and latest historic emissions data at sectoral level (energy supply, energy use, transport, industrial processes, agriculture and waste).

Source: EEA, 2011a.

([10]) European Commission, 2010.

2 Emission targets and Kyoto compliance

The EU-15, all EU Member States (except Cyprus and Malta), Croatia, Iceland, Liechtenstein, Norway and Switzerland have individual GHG reduction and limitation targets under the Kyoto Protocol. Together, these European countries committed to achieve an annual emission reduction of 456 Mt CO_2-equivalent below 1990 levels over the period 2008 to 2012.

To achieve their Kyoto targets, countries must balance their emissions with an emission budget depending on their target. Such balance can be achieved by limiting or reducing domestic emissions and by increasing the emission budget for the period 2008–2012 (assigned amount) through the use of flexible mechanisms and LULUCF activities.

In the EU as well as in Liechtenstein and Norway, governments must specifically balance their emissions from the sectors which are not covered by the EU ETS: emission levels in the ETS sectors do not influence the Kyoto achievement of those countries.

By allocating EU emission allowances to sectors covered by the EU ETS, Member States determined indirectly a limit to the emissions of their sectors not covered by the EU ETS. The contribution of the sectors covered by the EU ETS towards achieving each country's Kyoto target has been determined in the NAPs, which fix a legal cap on emissions for these sectors for the period 2008–2012. Each cap corresponds to a number of allowances taken from the overall Kyoto emission budget of each country and attributed to ETS sectors.

To ensure that the EU-15 reaches its common target, all its Member States must achieve their respective burden-sharing target. Excess compliance units resulting from overachievement by some countries might not be available to the EU-15 for achieving compliance. For example, in the United Kingdom legislation ensures that any carbon units in excess of the country's first carbon budget for 2008–2012 (which requires greater emissions reductions than the country's Kyoto target) are cancelled.

2.1 Emission targets under the KP and the burden-sharing agreement

Under the KP, the EU-15 has committed to a common emission reduction target of – 8 % compared to base-year levels, to be achieved over a 5-year commitment period from 2008 to 2012. Within this overall target, differentiated emission limitation or reduction targets have been agreed for each of the 15 pre-2004 Member States under an EU accord known as the 'burden-sharing agreement' (see Figure 2.1).

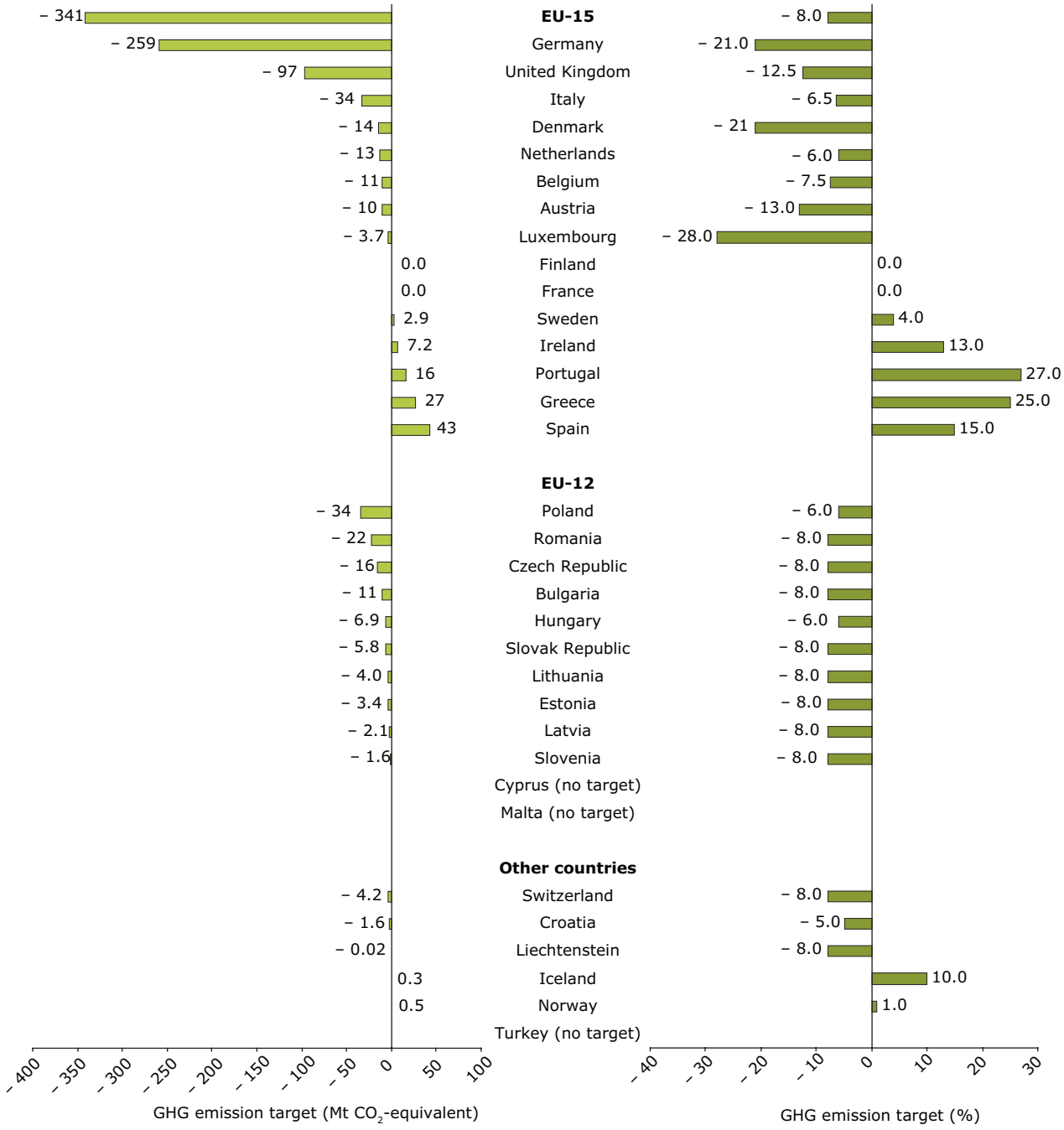
The EU-27 does not have a Kyoto target, since the Protocol was ratified before 2004 and 12 countries became EU Member States only afterwards. Therefore, 10 of these EU-12 Member States have individual targets under the KP, while Cyprus and Malta do not have targets.

Of the other EEA member countries, Iceland, Liechtenstein, Norway and Switzerland have individual targets under the KP while Turkey, which acceded to the KP in February 2009, has no quantified emission reduction commitment. Although being an Annex I Party to the Convention, Turkey is not included in the KP's Annex B because it was not Party to the UNFCCC when the KP was adopted ([11]). Cyprus and Malta also have no quantified emission reduction or limitation

([11]) See also http://unfccc.int/kyoto_protocol/items/3145.php online.

commitment. Both countries are Parties to the Kyoto Protocol; Cyprus still is a non-Annex I Party to the Convention, whereas Malta became an Annex I

Figure 2.1 Annual greenhouse gas emission targets in Europe under the KP (2008–2012) relative to base-year emissions



Note: The final emission levels allocated to the European Union and each Member State were established after completion of the reviews of the initial reports pursuant to Article 8 of the KP in 2008. To account for Denmark's exceptionally low base-year emissions compared to other years, Denmark received five million AAUs from the Union registry for the first commitment period under the KP (European Commission, 2010b).

Source: EEA, 2006; European Commission, 2006; European Commission, 2010b.

Party to the Convention at the end of 2010. Croatia has an individual target under the KP.

2.2 Achieving 2008–2012 objectives: the 'Kyoto compliance equation'

To comply with its objective under the KP, a Party must keep its total GHG emissions during the five years of the KP's first commitment period (2008–2012) within a specific emission budget. In other words, total GHG emissions during that period must remain equal or below the Party's assigned amount, which is the total quantity of valid Kyoto units it holds (within its registry). One Kyoto unit corresponds to 1 tonne of CO_2-equivalent emissions.

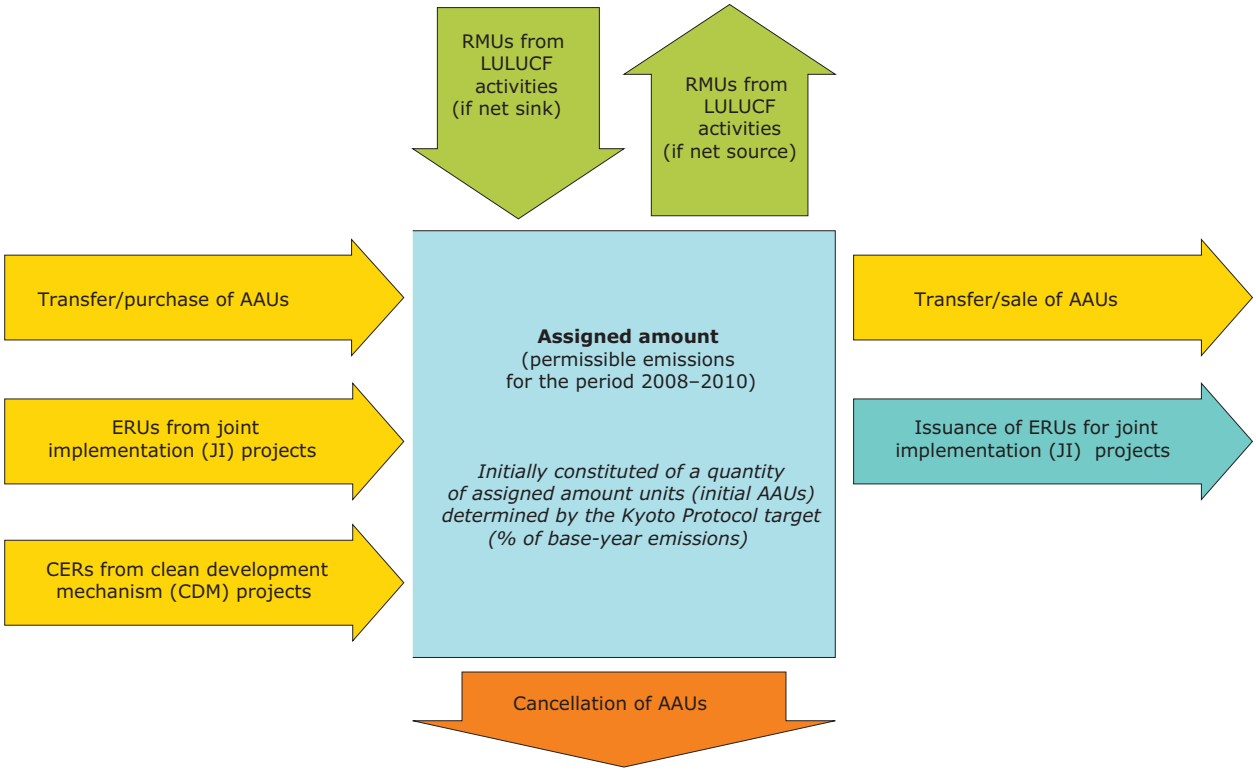
Each Party's assigned amount is equal to:

- an initial assigned amount, determined according to the Party's base-year emissions and its Kyoto target. This initial assigned amount is measured in AAUs;
- *plus/minus* any additional Kyoto units that the Party has acquired from or transferred to other Parties through the Kyoto mechanisms (certified emissions reductions (CERs) from clean development mechanism projects, emission reduction units (ERUs) from joint implementation projects or AAUs from international emissions trading (IET) between governments);
- *plus/minus* any additional Kyoto units that the Party has issued/cancelled for net removals/emissions from a LULUCF activity (removal units (RMUs)).

To comply with its Kyoto obligations, a Party needs to satisfy a 'Kyoto compliance equation', which can be summarised as follows.

'2008–2012 total GHG emissions'
≤
'total Kyoto units'
With: '**total Kyoto units**' = 'initial assigned amount (AAUs)' + 'use of flexible mechanisms (AAUs + CERs + ERUs)' + 'carbon sink removals (RMUs)'

Figure 2.2 Possible changes in an assigned amount under the KP



Note: AAU: assigned amount unit; CER: certified emission reduction; CDM: clean development mechanism; ERU: emission reduction unit; JI: joint implementation; RMU: removal unit; LULUCF: land use, land-use change and forestry.

Source: EEA.

Therefore to achieve its target, a Party can act on two sides of the 'compliance equation':

- *emissions side*: limiting or reducing its own emissions by acting at national level;
- *assigned amount side*: increasing its assigned amount, by acquiring additional Kyoto units at international level and by further enhancing CO_2 removals from carbon sink activities.

Compliance of EU-15 Member States under the internal EU burden-sharing agreement relies on the same principles, with each Member State's initial assigned amount being determined according to its individual burden-sharing target, instead of the – 8 % reduction target of the whole EU-15 under the KP.

After final emissions have been reported and reviewed for the entire commitment period, Parties to the KP will have 100 days to undertake final transactions necessary to achieve compliance with their commitment (the 'true-up period'). A final Kyoto compliance assessment will therefore not be possible before end 2014 or 2015. The assessment presented in this report is based on preliminary and incomplete data for the commitment period. It gives an indication where countries are compared to their emission reduction targets at the end of 2010 but cannot predict whether a country will finally be in compliance or not.

2.3 Role of emissions trading schemes in the achievement of Kyoto targets

By setting cap levels under the EU ETS, Member States — as well as Liechtenstein and Norway — have shared the national effort required to reach their Kyoto target among the sectors covered by the EU ETS and the other sectors.

The EU ETS is a domestic EU policy which aims at achieving cost-efficient emission reductions by setting emission targets to operators (primarily of industrial installations) in the EU. Operators have the choice between reducing their own emissions and purchasing carbon allowances (or CDM/JI (clean development mechanism/joint implementation) credits) on the European carbon market, whenever this is more cost-effective.

The EU ETS is linked to the flexible mechanisms under the KP. Any trading or transfer of EU allowance (EUA), which serve the purpose of proving compliance of an operator under the EU ETS, implies the transfer of an equal quantity of AAUs under the KP between Member States or within a Member State.

Following the introduction of the EU ETS and the finalisation of the second NAPs, Member States as well as Liechtenstein and Norway (who joined the ETS in 2008) have determined national caps for the emissions from sectors covered by the EU ETS for the first commitment period of the KP. These caps correspond to a certain number of Kyoto units being transformed into EU emission allowances and allocated to EU ETS operators. By doing so, these countries have fixed the overall contribution of the EU ETS towards reaching their burden-sharing or Kyoto target and they have indirectly determined the number of Kyoto units to remain for the other sectors not covered by the EU ETS (such as buildings, transport or agriculture). Hence, they have assigned themselves a 'non-ETS target' for 2008–2012, equivalent to their initial assigned amount reduced by the ETS cap they have determined.

In other words, EU governments have split their Kyoto emission budgets into two: one budget is allocated to the sectors covered by the EU ETS, where total emissions are capped under EU law and the distribution of abatement measures among sources is determined by market forces within the trading mechanism. The remaining budget is allocated to non-ETS sectors. Since national caps have been fixed for the trading period 2008–2012 of the EU ETS:

- governments must reach their Kyoto or burden-sharing targets through emission reductions from policies and measures addressing the sectors **not** covered by the EU ETS and/or through flexible mechanisms. A country's progress towards its Kyoto target is therefore determined by comparing its emissions in non-ETS sectors with its emission budget for the non-ETS sectors;
- emission levels in the sectors covered by the EU ETS result in the trading of allowances at EU ETS level but do not influence the

([12]) There is one exception to this rule: allowances remaining in the new entrants reserve at the end of the trading period that are not sold to the market might be used to achieve the national Kyoto target. Most Member States have not yet decided whether they intend to use any remaining allowances in the reserve or auction them. Ireland reported the quantity of unused allowances they expect to remain in the new entrants reserve (NER), which is intended to be used towards achieving its burden-sharing target. Except for this country, it has been assumed in this report that all EUAs in all Member States will be used by the trading sector and not transferred back to national governments.

achievement by a Member State of its Kyoto or burden-sharing target ([12]), since EU ETS operators are legally bound to surrender to their government an amount of allowances equivalent to their emissions.

To comply with their Kyoto obligations, the EU-15, Member States, Liechtenstein and Norway must satisfy the following equation.

'2008–2012 non-ETS GHG emissions'
≤
'initial assigned amount' – 'allowances issued under the EU ETS' + 'use of flexible mechanisms at government level' + 'carbon sink removals'

With: '**allowances issued under the EU ETS**' = 'free allocation 2008–2012 EU ETS' + 'auctions / sales 2008–2012 EU ETS'

This method is used in Section 3.1 to assess progress towards Kyoto and burden-sharing targets in Europe.

2.4 Increasing assigned amounts through flexible mechanisms and carbon sinks

The total quantity of valid emission allowances (Kyoto units) held by Member States within their national registry (their assigned amounts), and subsequently the target for the sectors that are not covered by the EU ETS, can be modified by the:

- expected CO_2 removals from carbon sink activities, under Articles 3.3 and 3.4 of the KP. Information on the expected removals/emissions is reported by EU Member States in a specific questionnaire; actual use can be approximated from the annual LULUCF inventories under the KP;
- use of the Kyoto mechanisms at government level (JI, CDM and IET): information on the projected use of such mechanisms is reported by EU Member States in a specific questionnaire under the EU Monitoring Mechanism Decision.

2.4.1 Carbon sinks

On top of policies and measures targeting sources of GHG emissions, Member States can use policies and measures to protect their existing terrestrial carbon stocks (e.g. by reducing deforestation and forest degradation, devegetation and land degradation) and to further enhance terrestrial carbon stocks (e.g. by increasing the area or carbon density of forests by afforestation and reforestation, rehabilitating degraded forests, and altering the management of forest and agricultural lands to sequester more carbon in biomass and soil). These LULUCF activities include the following:

- afforestation, reforestation and deforestation since 1990 (mandatory activities covered by Article 3.3 of the KP), which encompass lands which have been subject to direct, human-induced conversion from a forest to a non-forest state, or vice versa;
- forest management ([13]), cropland management, grazing land management and revegetation (voluntary activities under Article 3.4 of the KP), which encompass lands that have not undergone conversion since 1990, but are otherwise subject to a specific land use.

Parties account for net emissions or removals for each activity during the commitment period by issuing RMUs in the case of net GHG removals from LULUCF activities or cancelling Kyoto units in the case of net source of GHG emissions. LULUCF activities can therefore be used to compensate emissions from other sources if removals are higher than emissions from the sector. The number of RMUs that can be issued by each Party under the Article 3.4 'activity forest management' is capped. Thus, issued RMUs corresponding to this activity might be lower than the carbon removals from forest management actually reported.

RMUs could be accounted for at the end of the first commitment period or annually. According to Decision 13/CMP.1, Parties must indicate the frequency of accounting with their initial reports. For each activity under Articles 3.3 and 3.4, Parties may choose if they want to account annually during the commitment period or to account only once at the end of this period. The decision on the frequency determines when Parties may issue RMUs or cancel other units in case of emissions from Articles 3.3 and 3.4 activities. From the countries assessed in this report, only Denmark, France, Hungary, Liechtenstein and Switzerland have chosen annual accounting.

2.4.2 Kyoto mechanisms

([13]) The amount accountable for forest management is restricted by country-specific caps which are, in most cases, only a fraction of the anticipated uptake.

As an additional means of meeting commitments under the KP, Parties have the possibility to use three market-based mechanisms to lower the overall costs of achieving emission targets for the commitment period 2008–2012:

- project-based mechanisms in industrialised countries (JI);
- CDM in developing countries;
- IET, which allows countries that have achieved emission reductions beyond those required by the KP to sell their surplus Kyoto units to countries finding it more difficult or expensive to meet their commitments.

Use of these mechanisms must be 'supplemental to domestic action' to achieve KP targets.

Treatment of surplus AAUs (overdelivery) in the United Kingdom

In the United Kingdom, the Carbon Accounting Regulations (Statutory instruments, 2009. Carbon accounting regulations, No 1257) ensure that any carbon units, in the carbon credit account, in excess of the United Kingdom first carbon budget (which requires greater emissions reductions than the country's Kyoto target) are cancelled and therefore not used to offset GHG emissions in the United Kingdom or in any other country during the first commitment period 2008–2012.

2.5 Implications of target overdelivery by some Member States in the EU-15

A Member State that would limit or reduce its domestic emissions below its assigned amount would hold an amount of unused AAUs (or other unit types) by the end of the commitment period. Such overdeliveries with domestic policies and measures alone are projected by Germany, Greece, France, Finland, Sweden and the United Kingdom, with the largest surplus AAUs in the EU-15 anticipated from Germany, France and the United Kingdom. Most EU-12 Member States also project large amounts of surplus AAUs (see Figure 2.3).

By the end of the commitment period, a Kyoto unit held by a Party within its national registry can be:

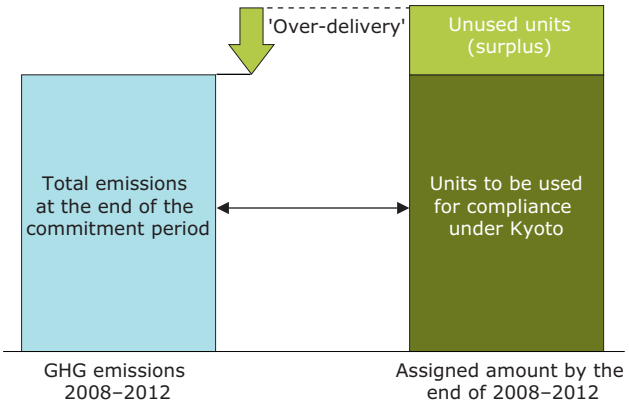
- transferred to another Party's registry (e.g. under *international* emissions trading);
- 'retired', i.e. used towards meeting a Kyoto or burden-sharing commitment;
- cancelled, i.e. this unit would not be further transferred or used towards meeting a Kyoto or burden-sharing commitment,

In addition, the KP allows Parties holding surplus units by the end of the commitment period to request that these units (except RMUs ([14])) be carried over to the subsequent commitment period, subject to applicable rules. Without limitation, such banking may have considerable negative effects on the environmental integrity of a future climate agreement and on the comparability of efforts among Annex I Parties.

If surplus AAUs held by an EU-15 Member State by the end of the commitment period were retired or transferred through the flexible mechanisms, to be subsequently retired either to another EU-15 Member State or to the European Community, the EU-15 would benefit from these AAUs and would be able to fill any shortfall of units left by any Member State not able to meet its burden-sharing target.

If surplus AAUs held by an EU-15 Member State by the end of the commitment period were transferred to another Party outside the EU-15, cancelled or banked for use in a subsequent commitment period, the EU-15 would not be able to benefit

Figure 2.3 Concept of target over-delivery and surplus assigned amount



Source: EEA, 2010.

([14]) Decision 13/CMP.1 contained in document FCCC/KP/CMP/2005/8/Add.2, paragraph 16.

from these units for its compliance and the extent of the overdelivery currently projected would be subsequently reduced.

There is certainty that such a situation will occur in at least one EU-15 Member State for part of the potential surplus AAUs (the United Kingdom – see box) but other Member States could adopt similar dispositions. As it cannot be taken for granted that any other EU-15 Member State would make available any surplus Kyoto units to the EU-15 for its compliance, the EU-15 relies on each single EU-15 Member State to achieve its own burden-sharing target. Any Member State not complying with its target could lead to non-compliance for the EU-15 as well.

Any failure in the delivery of policies and measures in terms of emission reductions, in particular in the sectors not covered by the EU ETS, will have to be compensated for by the acquisition of additional Kyoto units through Kyoto mechanisms. The Kyoto mechanisms will, in practice, act as a safety valve since Parties, under the KP, can undertake final transactions necessary to comply with their commitment during a 100-day period after 2008 to 2012 emissions have been reported in 2014 and reviewed by the UNFCCC.

3 Current progress towards Kyoto targets

Although the economic crisis led to very significant GHG emission reductions in 2009 across Europe, its impacts on the situation of Member States and of the EU-15 vis-à-vis their respective Kyoto targets was somewhat limited, because the largest emission reductions took place in the sectors covered by the EU ETS, whereas emission levels in these sectors do not affect Member States' progress towards Kyoto targets.

Based on its average 2008–2010 emission levels, the EU-15 can be considered on track towards its reduction target under the Kyoto Protocol. By the end of 2010, emissions had exceeded their target by an average 198 Mt CO_2-equivalent per year, which represents 4.7 % of base-year emissions. Of these, 1.2 percentage points (51 Mt CO_2-equivalent) correspond to domestic emission reductions, the remaining difference being achieved by the expected carbon sequestration through forestry activities (0.9 percentage points) and planned use of flexible mechanisms by several national governments (2.5 percentage points). This calculation also takes into account the specific role of the EU ETS on Kyoto compliance in the EU, which requires considering specifically the gap between emissions and target in the sectors not covered by the ETS.

This positive result should be nuanced by the fact that its calculation takes into account the surplus Kyoto units resulting from target overdelivery currently observed in 12 EU-15 Member States. These surpluses largely exceed the shortfall observed in the three Member States currently too short on their burden-sharing target (Austria, Italy and Luxembourg). Since failure by any Member State to comply with its burden-sharing target by the end of the commitment period would actually result in the non-achievement of its target by the EU-15, Austria, Italy and Luxembourg must further reduce emissions by 2012 or plan on further increasing their use of flexible mechanisms and ensure appropriate budgets are in place to this end.

By the end of 2010, all Member States with a Kyoto target except these three countries, as well as Norway, were on track towards achieving their Kyoto commitments. In six EU-15 Member States (Germany, Greece, France, Finland, Sweden and the United Kingdom), nine EU-12 Member States (Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Romania and Slovakia) and Norway, this progress was achieved through domestic emissions mitigation only, average 2008–2010 GHG emissions in these countries being lower than their respective Kyoto or burden-sharing targets. When the intended use of flexible mechanisms and expected emission reductions from LULUCF activities over the full commitment period are also taken into account, seven additional Member States (Belgium, Denmark, Ireland, Spain, the Netherlands, Portugal and Slovenia) were also on track towards their targets by the end of 2010.

The following countries were on track towards their respective targets by the end of 2009 (the latest year for which historic GHG emission data is available): Croatia (with planned use of flexible mechanisms and LULUCF activities) and Iceland (with domestic emission reductions only). Two EEA member countries which are not part of the EU (Liechtenstein and Switzerland) were not on track towards their Kyoto target at the end of 2009. The Swiss government indicated that it has decided to increase the use of flexible mechanisms to meet the Kyoto target.

3.1 Total emission levels

National GHG inventories are available for the years 2008 and 2009, the first two years of the first commitment period under the KP. With the approximated EU GHG inventory calculated by Member States and the EEA, emission data for 2010 is also available for all Member States and Norway.

In 17 of the 30 European countries which have a Kyoto target and are assessed in this report, average 2008–2010 GHG emissions were below the respective Kyoto target (see Figure 3.1).

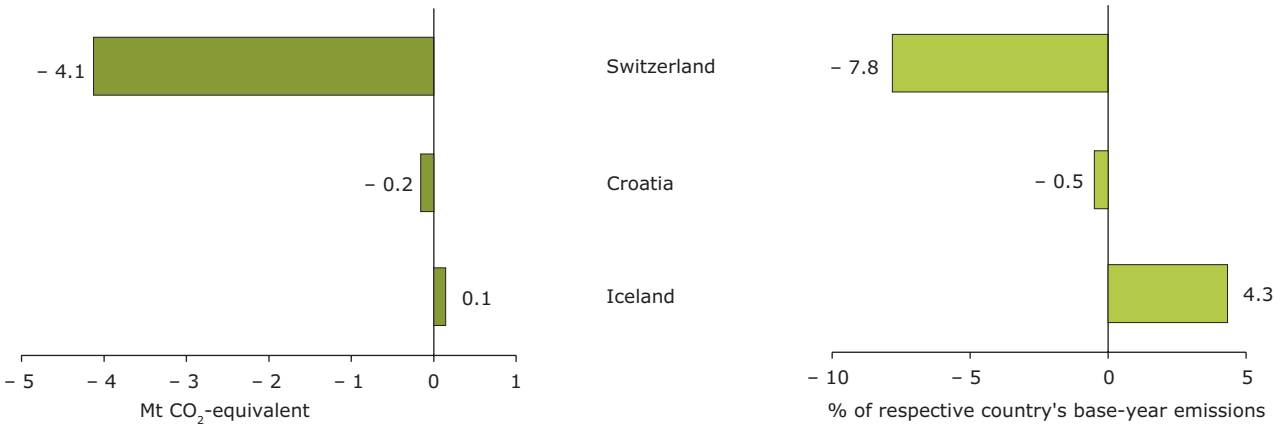
Figure 3.1 Gap between average 2008–2010 total GHG emissions and Kyoto targets (without the use of carbon sinks and flexible mechanisms)

Note: * 2008–2009 average emissions (no approximated 2010 GHG emissions available for Liechtenstein.

Each bar represents the gap between domestic emissions and the Kyoto target. A positive value indicates that national total emissions were lower than the Kyoto target.

Source: EEA, 2011a; EEA, 2011b.

Figure 3.2 Gap between average 2008–2009 total GHG emissions and Kyoto targets (without the use of carbon sinks and flexible mechanisms)



Note: A positive value indicates that national total emissions were lower than the Kyoto target.

No approximated 2010 GHG emissions available for Croatia, Iceland and Switzerland.

Each bar represents the gap between domestic emissions and the Kyoto target.

Source: EEA, 2011a.

However, for all countries except Croatia, Iceland and Switzerland, this simple comparison between total emissions and targets is purely indicative and does not give an accurate picture of the situation of countries vis-à-vis their respective targets because it does not take into account the effect of the allocation of allowances under emissions trading schemes such as the EU ETS ([15]) on the assigned amounts available to achieve the Kyoto targets (see Section 2.3). Furthermore, the removal of atmospheric CO_2 through LULUCF activities and the use of Kyoto mechanisms may further modify the assigned amount of each country.

As no ETS-verified emissions are available for Croatia, Iceland and Switzerland, one can assess current progress of these countries towards their Kyoto targets by comparing total emissions with their respective targets.

On the basis of domestic GHG emissions for the period 2008–2009 only, Iceland was on track towards its Kyoto target while Croatia and Switzerland were not on track towards their targets.

3.2 Emission levels in the non-ETS sectors

An accurate assessment of current progress towards Kyoto targets is based on a comparison of non-ETS emissions (total GHG emissions minus ETS-verified emissions) with the relevant non-ETS target for Member States (total AAUs minus the number of allowances issued/allocated under the EU ETS).

By the end of 2010, six EU-15 Member States, nine EU-12 Member States and one EEA member country had reached an average non-ETS emissions level below their respective average Kyoto targets (i.e. for the sectors not covered by the EU ETS) (see Figure 3.3). For the EU-12 Member States, the current situation is mainly due to the substantial emission reductions that took place in the 1990s, since emissions have been mostly increasing in these countries since the end of the 1990s.

At EU-15 level, average 2008–2010 emissions in the sectors not covered by the ETS were lower than the corresponding assigned amount (taking into account the effect of any allocation of allowances to the EU ETS in 2008 and 2009), by a difference of 51 Mt CO_2-equivalent per year, representing a surplus equal to 1.2 % of the EU-15 base-year emissions. The value would drop to a shortfall of 124 Mt CO_2-equivalent per year (2.9 % of base-year emissions) if the overachievement of the six EU-15 Member States where average 2008–2010 emissions in the sectors not covered by the EU ETS were below their relative targets was not taken into account (see Section 2.4).

([15]) All 27 EU Member States, Norway and Liechtenstein participate in the EU ETS. Switzerland has its own emissions trading scheme.

An example of the calculation of the gaps presented in Figure 3.3 is provided in Table 3.3. This table also includes data and results related to the use of flexible mechanisms and carbon sinks. The data used for all countries are provided as an annex to this report.

Table 3.1 Current progress towards Kyoto or burden-sharing targets based on historic domestic GHG emissions (no use of flexible mechanisms or LULUCF)

Country grouping	Average 2008–2010 emissions in sectors not covered by the EU ETS < Target for sectors not covered by the EU ETS	Average 2008–2010 emissions in sectors not covered by the EU ETS > Target for sectors not covered by the EU ETS
EU-15	• EU-15 • Finland • France • Germany • Greece • Sweden • United Kingdom	• EU-15 (no overachievement) • Austria • Belgium • Denmark • Ireland • Italy • Luxembourg • Netherlands • Portugal • Spain
EU-12 Member States	• Bulgaria • Czech Republic • Estonia • Hungary • Latvia • Lithuania • Poland • Romania • Slovakia	• Slovenia
Other EEA member countries, EU candidate country	• Norway	• Liechtenstein*

Note: * Liechtenstein: the gap refers to the average 2008–2009 non-ETS emissions because no approximated 2010 GHG emissions are available.

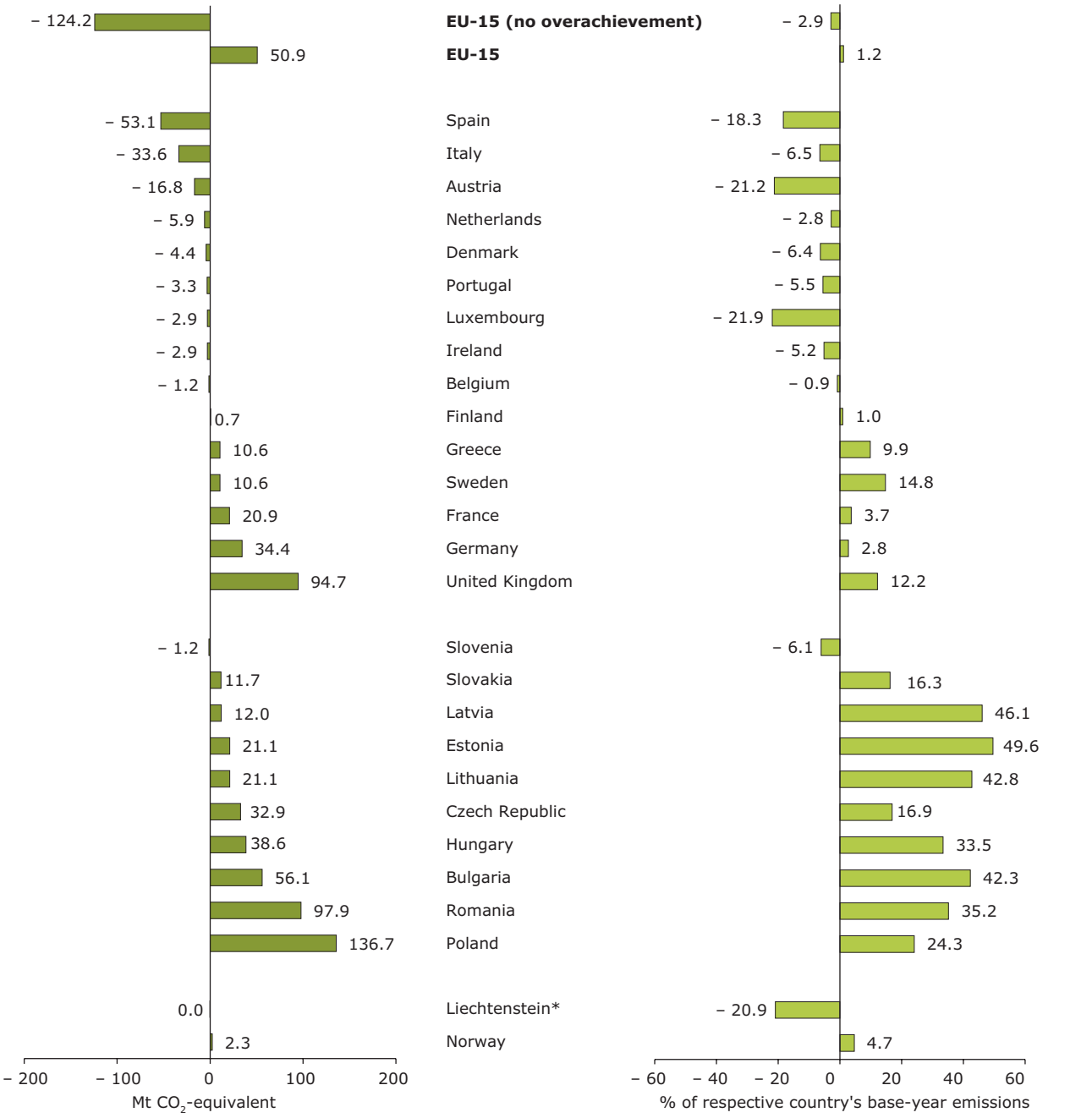
Target = [Kyoto or burden-sharing target – allocation in the EU ETS], excluding planned use of Kyoto mechanisms by governments and carbon sinks. The Kyoto or burden-sharing target corresponds to the initial assigned amount of each country.

Allocation: allowances freely allocated or auctioned to the EU ETS in 2008 and 2009.

'EU-15 (no overachievement)' corresponds to the situation of the EU-15 where all surplus AAUs from target overachievement in the EU-15 are not taken into account, to reflect the possibility that Member States with a surplus could use any remaining allowances for their own purposes and not necessarily make them available to compensate for Member States with a shortfall.

Source: EEA, 2011a; EEA, 2011b, EEA, 2011d.

Figure 3.3 Gaps between 2008–2010 GHG emissions and targets for the sectors not covered by the EU ETS (without the use of carbon sinks and flexible mechanisms)



Note: * Liechtenstein: the gap refers to the average 2008–2009 non-ETS emissions because no approximated 2010 GHG emissions are available.

The data used in the calculation of the gaps presented in the graph are available as an annex to this report.

A positive value indicates that average 2008–2010 emissions in the non-ETS sectors were lower than the average annual target, taking into account the effect of allowances attributed to the EU ETS and without use of carbon sinks and Kyoto mechanisms.

'EU-15 (no overachievement)' corresponds to the situation of the EU-15 where all surplus AAUs from target overachievement in the EU-15 are not taken into account, to reflect the possibility that Member States with a surplus could use any remaining allowances for their own purposes and not necessarily make them available to compensate for Member States with a shortfall.

Source: EEA, 2011a; EEA, 2011b, EEA, 2011d.

3.3 Use of flexible mechanisms and LULUCF

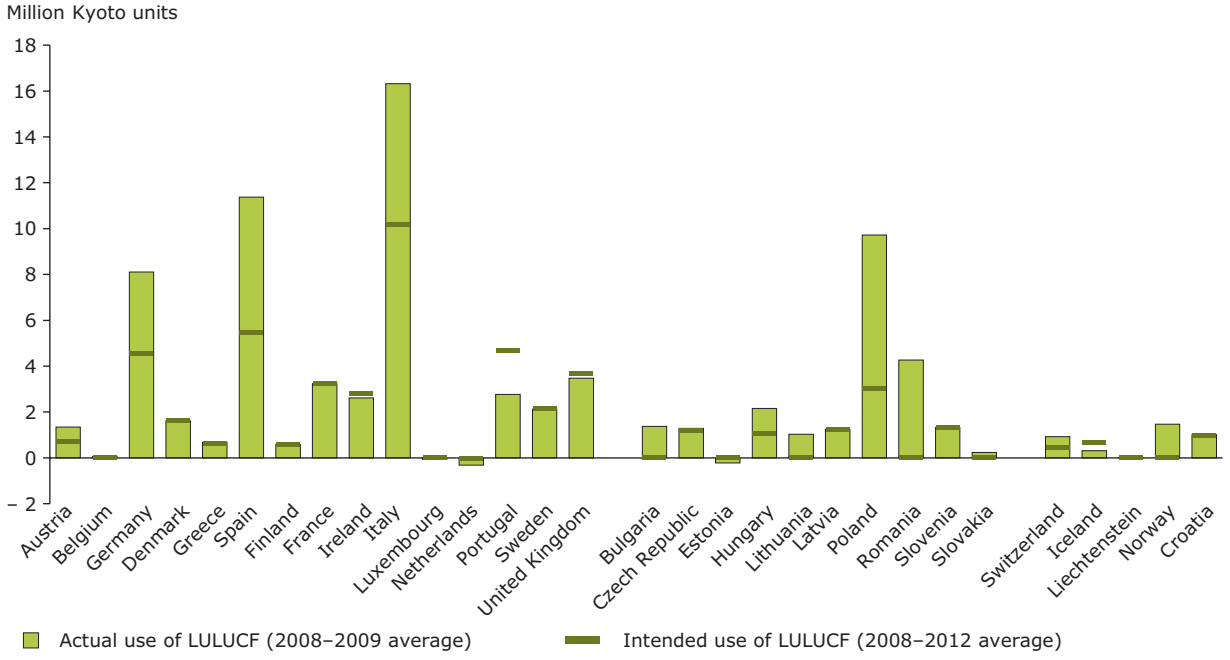
The expected effect of LULUCF in the EU-15 corresponds to an average removal of 40 Mt CO_2 per year of the commitment period (1.0 % of EU-15 base-year emissions). Three European countries (Estonia, Luxembourg and the Netherlands) report net sources from land use activities in 2008 and 2009, based on their reporting under the KP showing their actual use of LULUCF activities.

Most countries intend to make use of the flexible mechanisms, either as buyers or as sellers of emission units. Germany, Greece, France, Romania, Sweden and the United Kingdom have not reported on any intention to use Kyoto mechanisms at governmental level and have not reported on any sale of units so far under the EU Monitoring Mechanism. Although Poland did not report on any use of flexible mechanisms either, publicly available information indicates that this country has already sold Kyoto units (see Section 3.3.2). For the EU-15, the intended net acquisition amounts to 108 million units or 2.5 % of base-year emissions.

3.3.1 Carbon sinks

The expected annual GHG removals/emissions from LULUCF activities as reported by EU Member States, Iceland and Switzerland, and the actual values as reported in the LULUCF inventories under the KP for 2008 and 2009 are presented in Figure 3.4 ([16]). Spain, Italy and Poland reported the highest removals from LULUCF activities. Only Estonia, Luxembourg and the Netherlands reported net sources from this sector in this period. Compared to the 2010 report, Portugal does not report anymore net sources from Articles 3.3 and 3.4 activities in its LULUCF inventory under the KP, which is due to the implementation of considerable methodological improvements for the calculation

Figure 3.4 Actual (2008 and 2009) and expected (2008–2012) average annual emissions and removals from LULUCF activities



Note: A positive value indicates that the country has/expects net removals from LULUCF activities, taking into account the caps for forest management. It does not necessarily mean that the country intends to actually use RMUs to achieve its Kyoto commitment. The estimate of the actual effects of LULUCF activities might change in future years if better data becomes available.

Source: EEA, 2011e; data on LULUCF reported under the KP, 2011.

([16]) Estimated 'actual' annual accounting during the first commitment period is based on latest KP LULUCF submissions (updated 27 May 2011). All LULUCF accounting rules have been applied in the calculation of the actual use of LULUCF (see application of the cap for Forest Management as contained in the appendix to decision 16/CMP.1). Estimated 'expected' annual accounting in EU Member States during the first commitment period is based on latest questionnaires and taking into account the same rules.

of these emissions and removals. This brings actual results in line with original expectations by this country that LULUCF activities will represent a net sink over the full commitment period.

Estimates of carbon stock changes and non-CO_2 emissions for the LULUCF sector is commonly done by estimating changes in carbon density and land use area based on inventory-type empirical approaches. Land use inventories are typically only conducted every few years and the estimates of the actual emissions/removals might therefore undergo substantial changes in future inventory submissions. For this reason, the assessment of actual progress towards Kyoto targets is based on the expected and not actual use of LULUCF activities for the EU-27 Member States covered and EEA member countries that chose to account only once at the end of the commitment period. For Parties that elected annual accounting during the first commitment period it is assumed that there is more reliable data available to ensure qualitative estimates of emissions and removals from LULUCF activities. However, removals/emissions from LULUCF are subject to variability, thus also for Parties with an annual accounting of LULUCF activities (Denmark, France, Hungary, Liechtenstein and Switzerland) the information as provided with the questionnaires submitted under the EU Monitoring Mechanism is used for the assessment of actual progress towards Kyoto targets. In addition, Parties, with their LULUCF inventories under the KP, provided information only for 2008 and 2009 and thus no data on the actual annual emissions and removals from LULUCF activities for 2010 is available. Hence, Figure 3.4 refers to the 2008–2009 average annual emissions and removals.

3.3.2 Kyoto mechanisms

All of the European countries which have difficulties in achieving the required emission reductions through domestic action alone intend to compensate excess emissions through the use of flexible mechanisms. Spain, Italy, the Netherlands and Austria are the countries (in decreasing order) that intend to acquire the largest quantities of units. Together, EU-15 Member States intend to buy about 108.4 million units per year of the commitment period through the use of flexible mechanisms, which represents 2.5 % of EU-15 base-year emissions. In comparison, during the first 3 years (three fifths) of the commitment period, these countries have acquired an average 28.3 million units per year, which represents about one quarter of the intended annual use. Five EU-15 Member States (Ireland, Italy, Luxembourg, the Netherlands and Portugal) have reduced the amount of Kyoto units they intend to use to achieve Kyoto compliance, compared to last year. In the EU-12, most Member States are in a situation of net sellers of Kyoto units, due to the hot air generated by significant emission reductions which occurred in the 1990s with the transition to market economies compared to their Kyoto reduction targets. Compared to 2010, three additional Member States reported sales of Kyoto units (Bulgaria, Estonia and Lithuania).

A comparison by country between the intended use of Kyoto mechanisms (on average for the whole commitment period) and the actual use of these mechanisms observed in 2008, 2009 and 2010 (based on the quantities of allowances delivered to the party holding account in their Kyoto registries) ([17]) shows substantial differences for some countries, in particular for Spain, Italy and Austria (Figure 3.5). In these three Member States, the announced quantities of Kyoto units remain much larger than the actual quantities on these countries' accounts. The observed differences can be explained by several reasons, including among others the:

- regular delays in the actual delivery of Kyoto units, not least with regard to ERUs;
- amount of time required by the implementation of JI/CDM projects before units can be finally delivered. Delivery dates may therefore be set to later years in the commitment period. Furthermore the performance of JI/CDM projects may be affected by delays in validation, verification and registration on the UN or national levels which may require write downs and reallocation to other projects. These delays affect governments that do not purchase credits on the secondary market but rather participate in project development from an early stage;
- possibility that purchased and delivered units are not always held on national holding accounts. For example, in Ireland and Austria the institution authorised to purchase units for the government keeps the delivered units on its account until the final retirement;
- possible preference by some countries to wait until the end of the commitment period to use the flexible mechanisms and acquire Kyoto units, depending on their current progress

([17]) Due to the late start of national and ETS registries in some countries it is not feasible to assess the actual delivery/sale of units in 2008. Therefore the average delivery/sale of units for the years 2008 and 2009 has been used for the figure.

Figure 3.5 Intended (2008–2012) and actual (2008–2010) average annual use of the Kyoto mechanisms

Note: * The gap refers to the average 2008–2009 non-ETS emissions because no approximated 2010 GHG emissions are available.

Positive values indicate net acquisition of Kyoto units while negative values indicate net sales.
The actual use of Kyoto mechanisms is based on the delivery of units according to the SEF table. Countries might have acquired more units than are recorded in the SEF tables, e.g. due to delivery dates later in the commitment period.
For the United Kingdom, SEF tables include the overseas territories and the crown dependencies of the United Kingdom. For the purposes of the implementation of Article 4 of the KP and as they are not part of the EC, the overseas territories and the crown dependencies of the United Kingdom were excluded from the initial assigned amount of the United Kingdom under the EC. In consequence, the trade of AAUs is slightly overestimated for the United Kingdom, as SEF tables for the geographical coverage of the United Kingdom under the EC only are not available.
For Denmark, Greenland is included in the SEF tables. For the purposes of the implementation of Article 4 of the KP and as Greenland is not part of the EC, Greenland was excluded from the initial assigned amount of Denmark under the EC. In consequence, the trade of AAUs is slightly overestimated for Denmark, as SEF tables for the geographical coverage of Denmark under the EC only are not available.
In Switzerland, the government decided to increase the use of flexible mechanisms compared to the current figure in order to achieve the Kyoto target.

Source: EEA, 2011e; data on flexible mechanisms (SEF tables) reported under the KP, 2011.

towards their targets. It should also be noted that Member States have the possibility to purchase secondary credits until after the end of the commitment period, all the way up to the end of the true-up period ([18]) (around 2014/2015).

For these reasons, the assessment of actual progress towards Kyoto targets is based on the intended and not actual use of flexible mechanisms.

3.4 Current progress of European countries

3.4.1 *Countries participating in the EU ETS (EU Member States, Liechtenstein and Norway)*

The comparison of average 2008 and 2010 emissions (in the sectors not covered by the EU ETS) with the relevant assigned amounts, taking into account the

([18]) The true-up period is a 100-day period after final emissions have been reported for the commitment period during which Parties have the opportunity to undertake final transactions necessary to achieve compliance with their commitments.

projected use of Kyoto mechanisms by governments and expected removals from carbon sink, shows that 22 Member States and one other EEA member country are currently on track towards achieving their Kyoto targets (see Table 3.2 and Figure 3.6).

For three EU-15 Member States (Italy, Luxembourg and Austria) emissions remain however higher than their respective assigned amounts despite their planned use of Kyoto mechanisms and carbon sinks. To achieve their Kyoto targets, these countries must achieve further emission reductions in the two remaining years of the commitment period (2011–2012) and increase the quantity of emission credits they intend to acquire through flexible mechanisms or generate from LULUCF activities. Liechtenstein is in a similar situation, based on its 2008–2009 average emissions. Whatever option is followed, all these countries must ensure that the necessary budgets are properly planned and safeguarded to achieve compliance.

In a number of countries, flexible mechanisms and LULUCF are expected to play a significant role to

Table 3.2 Current progress towards Kyoto or burden-sharing targets, taking into account the effect of allocation to the EU ETS, planned use of flexible mechanisms by governments and carbon sinks

Country grouping	Average 2008–2010 emissions in sectors not covered by the EU ETS < Target, including planned use of carbon sinks and flexible mechanisms	Average 2008–2010 emissions in sectors not covered by the EU ETS > Target, including planned use of carbon sinks and flexible mechanisms
EU-15	• EU-15 • Belgium • Denmark • Finland • France • Germany • Greece • Ireland • Netherlands • Portugal • Spain • Sweden • United Kingdom	• EU-15 (no overachievement) • Austria • Italy • Luxembourg
EU-12 Member States	• Bulgaria • Czech Republic • Estonia • Hungary • Latvia • Lithuania • Poland • Romania • Slovakia • Slovenia	
Other EEA member countries, EU candidate country	• Norway	Liechtenstein*

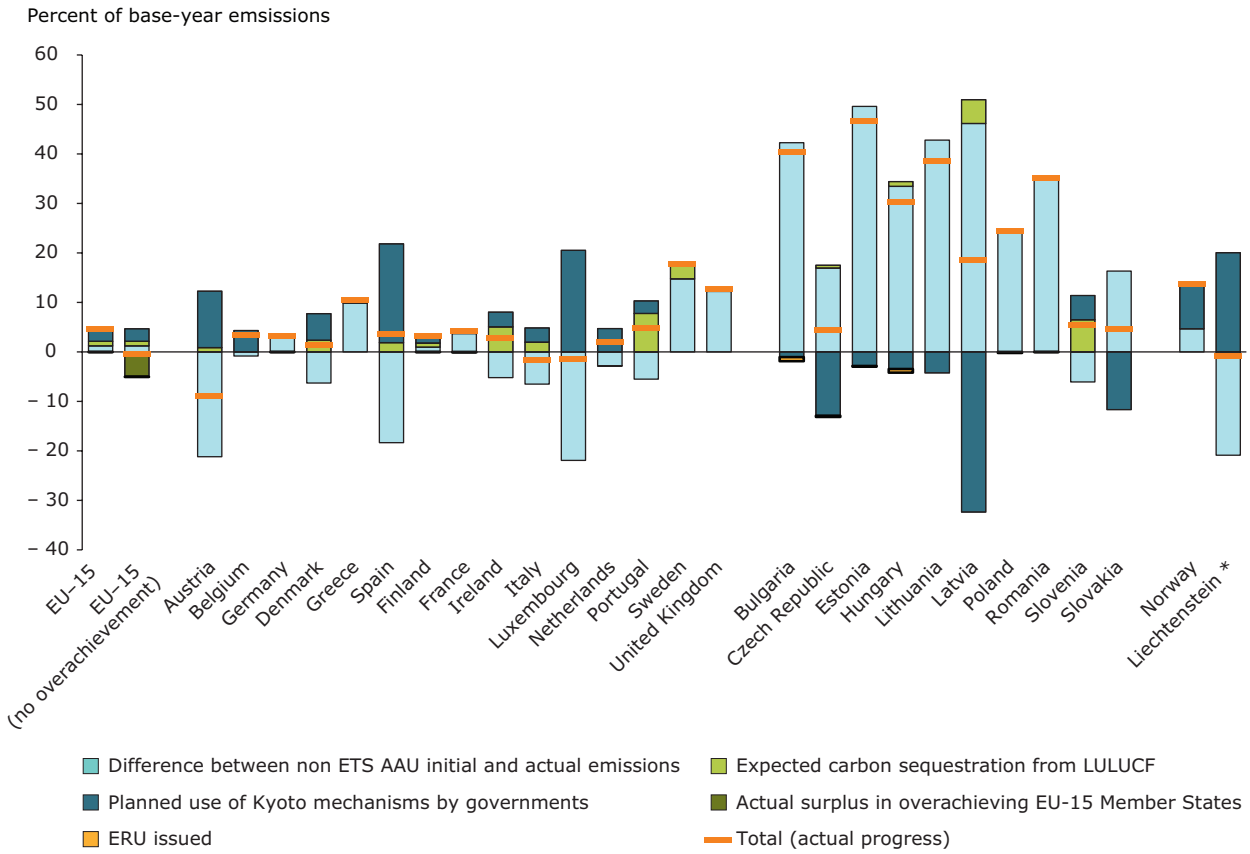
Note: * Liechtenstein: the gap refers to the average 2008–2009 non-ETS emissions because no approximated 2010 GHG emissions are available.

Target = [Kyoto or burden-sharing target – allocation/auctioning in the EU ETS], including planned use of Kyoto mechanisms by governments and carbon sinks. The Kyoto or burden-sharing target corresponds to the initial assigned amount of each country.

'EU-15 (no overachievement)' corresponds to the situation of the EU-15 where all surplus AAUs from target overachievement in the EU-15 are not taken into account, to reflect the possibility that Member States with a surplus could use any remaining allowances for their own purposes and not necessarily make them available to compensate for Member States with a shortfall.

Source: EEA, 2011a; EEA, 2011b; EEA, 2011d, EEA, 2011e.

Figure 3.6 Decomposition of current progress achieved by European countries towards their Kyoto targets by the end of 2010



Note: * Liechtenstein: the gap refers to the average 2008–2009 non-ETS emissions because no approximated 2010 GHG emissions are available.

The assessment is based on emissions and the targets of the sectors not covered under the EU ETS, the planned use of flexible mechanisms as well as the expected effect of LULUCF activities. All values are 2008–2010 averages except for Liechtenstein (2008–2009 averages).

A positive sign signifies a favourable contribution towards target achievement.

'EU-15 (no overachievement)' corresponds to the situation of the EU-15 where all surplus AAUs from target overachievement in the EU-15 are not taken into account, to reflect the possibility that Member States with a surplus could use any remaining allowances for their own purposes and not necessarily make them available to compensate for Member States with a shortfall.

Source: EEA, 2011a; EEA, 2011b; EEA, 2011d, EEA, 2011e.

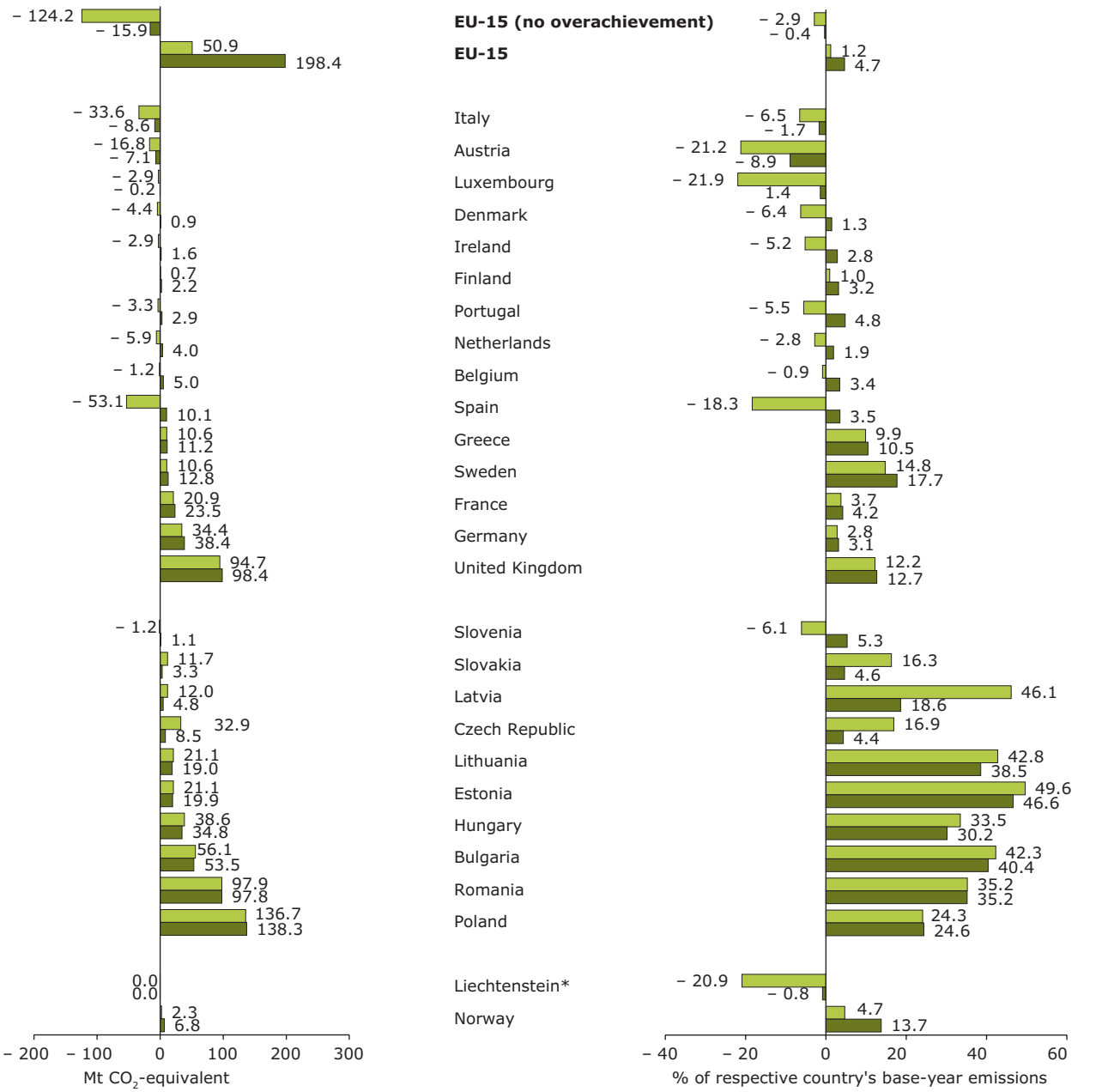
bridge the current gap existing between emissions and targets (see Figure 3.7).

- In Croatia, Portugal and Slovenia, carbon sequestration from sinks as currently projected for the full commitment period could fully cover the gap existing between current emission levels in the sectors not covered by the EU ETS and their targets. In Ireland, carbon sink removals also represent more than half of the gap between emissions and target.
- The use of flexible mechanisms as currently planned by governments could fully bridge the gap between current emissions in the sectors not covered by the EU ETS and targets in Spain and Portugal, and represents more than half of that current gap in Austria, Denmark, Liechtenstein, Luxembourg and Slovenia.

In the EU-12, the Czech Republic, Latvia and Slovakia intend to sell Kyoto units in quantities representing more than 10 % of their respective base-year emissions.

Compared to the results of the 2010 assessment, Luxembourg is the only country which becomes assessed as 'not on track' when it was considered on track last year. The situation remains alarming for Italy and Austria, which were already identified as not on track in the previous assessment. On the other hand, Denmark which was considered not on track by a small margin can now be considered on

Figure 3.7 Gap between average 2008–2010 non-ETS emissions and Kyoto targets (with and without the use of carbon sinks and flexible mechanisms)



Note: * The gap refers to the average 2008–2009 non-ETS emissions because no approximated 2010 GHG emissions are available.

Subsequent to the effect of allocation of allowances to the EU ETS, the target and annual emissions are those of the sectors not covered by the EU ETS. For each country, the top bar represents the gap between domestic emissions and the Kyoto target, while the bar below includes the planned effect of Kyoto mechanisms and carbon sinks. A positive value indicates a country for which average 2008 and 2009 non-ETS emissions were lower than the annual target. The assessment is based on average 2008–2010 emissions and the planned use of flexible mechanisms as well as the expected effect of LULUCF activities. EU-15 values are the sum of the gaps/surplus' for the 15 EU Member States which are part of the burden-sharing agreement. 'EU-15 (no overachievement)' corresponds to the situation of the EU-15 where all surplus AAUs from target overachievement in the EU-15 are not taken into account, to reflect the possibility that Member States with a surplus could use any remaining allowances for their own purposes and not necessarily make them available to compensate for Member States with a shortfall. Croatia, Iceland and Switzerland are not included as for these EEA member countries it is currently not possible to calculate non-ETS emissions.

Source: EEA, 2011a; EEA, 2011b; EEA, 2011d, EEA, 2011e.

track towards its target, due to the allocation by the EU to this country, in 2010, of an extra amount of Kyoto units equivalent to 1 million AAUs per year, in compensation of exceptionally low base-year emissions in 1990.

3.4.2 *Countries not participating in the EU ETS (Croatia, Iceland and Switzerland)*

Croatia, Iceland and Switzerland are currently not included in the EU ETS ([19]), thus the current progress towards Kyoto targets is not based on non-ETS emissions, but on total GHG emissions (see Section 3.1). Furthermore, no approximated GHG inventories for 2010 are available so current progress is based on the average 2008 and 2009 emissions.

By the end of 2009, Croatia and Iceland were on track towards their respective targets. Switzerland remained above its respective target, regardless of its planned use of flexible mechanisms and carbon sink removals. Consequently, this country is currently not on track towards its Kyoto target. Based on the actual emissions for 2008 and 2009 and projections for the remaining years of the first commitment period, the Swiss government decided on 10 June 2011 to increase its use of flexible mechanisms over the full commitment period to meet its Kyoto target ([20]).

3.5 Current progress of the EU-15

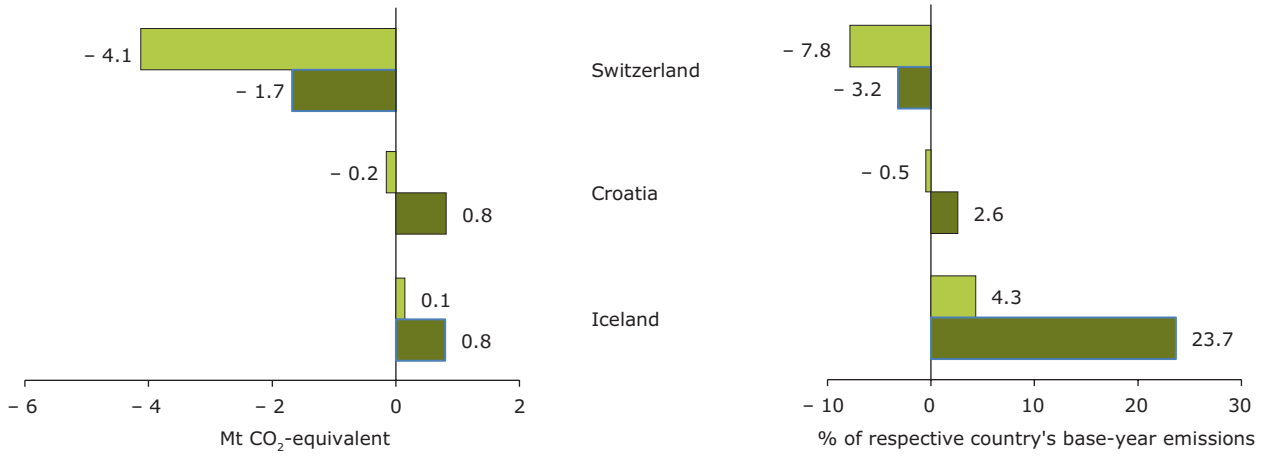
3.5.1 *Overall assessment*

On average over the three first years of the KP's first commitment period, the EU-15 is on track towards its Kyoto target, with an average overdelivery equivalent to approximately 198 Mt CO_2-equivalent per year (4.7 % of its base-year emissions). All things being equal, this is equivalent to say that in comparison with an 8 % reduction target under the Kyoto Protocol, the EU-15 currently stands 12.7 % below its base-year emissions, or 9.2 % when the planned effects of carbon sinks and Kyoto mechanisms are not taken into account.

This conclusion results from a several-steps analysis:

- Aggregated average non-ETS emissions from EU-15 Member States in 2008, 2009 and 2010 were lower, by a gap of 50.9 Mt CO_2-equivalent

Figure 3.8 Gap between average 2008–2009 total GHG emissions and Kyoto targets (with and without the use of carbon sinks and flexible mechanisms)



Note: The assessment is based on average 2008–2009 emissions and the planned use of flexible mechanisms as well as the expected effect of LULUCF activities. For each country, the top bar represents the gap between domestic emissions and the Kyoto target, while the bar below includes the planned effect of Kyoto mechanisms and carbon sinks. A positive value indicates a country for which average 2008 and 2009 non-ETS emissions were lower than the annual target. Based on the actual Swiss emissions for 2008 and 2009 and projections for the remaining years of the first commitment period, the Swiss government decided on 10 June 2011 to increase its use of flexible mechanisms to meet the Kyoto target.

Source: EEA, 2011a; EEA, 2011e.

([19]) Like Liechtenstein and Norway, Iceland joined the EU ETS in 2008. However, no installation from Iceland currently falls under the scope of the directive.

([20]) See http://www.bafu.admin.ch/dokumentation/medieninformation/00962/index.html?lang=de&msg-id=39555 online.

per year, than the non-ETS target calculated as a difference between initial AAUs and allowances allocated under the EU ETS for the years 2008, 2009 and 2010. This gap represents 1.2 % of the EU-15 base-year emissions.

When the aggregated expected effects of carbon sink removals and of Kyoto mechanisms are taken into account, the EU-15 appears on track towards reaching its Kyoto target by the end of 2010, with a current gap of 198 Mt CO_2-equivalent, which represents 4.7 % of EU-15 base-year emissions compared to an 8 % reduction target. Carbon sinks are expected to contribute towards an emission reduction of 40 Mt CO_2-equivalent (0.9 % of EU-15 total base-year emissions) while flexible mechanisms are planned to contribute towards a reduction of 108 Mt CO_2-equivalent (2.5 % of EU-15 total base-year emissions) (see Figure 3.9).

If none of the currently observed overachievement by EU-15 Member States on track towards their targets in 2008–2010 was accounted for, the shortfalls currently observed in three Member States would put the EU-15 off track towards its target by a gap of 15.9 Mt CO_2-equivalent (see Figure 3.6). This gap is the sum of the shortfalls observed in:

- Italy (8.6 Mt CO_2-equivalent, 1.7 % of its base-year emissions compared to a 6.5 % reduction target for total emissions);
- Luxembourg (0.2 Mt CO_2-equivalent, 1.4 % of its base-year emissions compared to a 28 % reduction target for total emissions);
- Austria (7.1 Mt CO_2-equivalent, 9 % of its base-year emissions compared to a 13 % reduction target for total emissions).

Table 3.3 provides an overview of the way the overall EU-15 gap is calculated. The data used for all countries are provided as an annex to this report.

3.5.2 2008–2010 trend

In 2008, although total GHG emissions were higher than the annual average Kyoto target, emissions in the non-ETS sectors were actually lower than their permissible emissions (Figure 3.10).

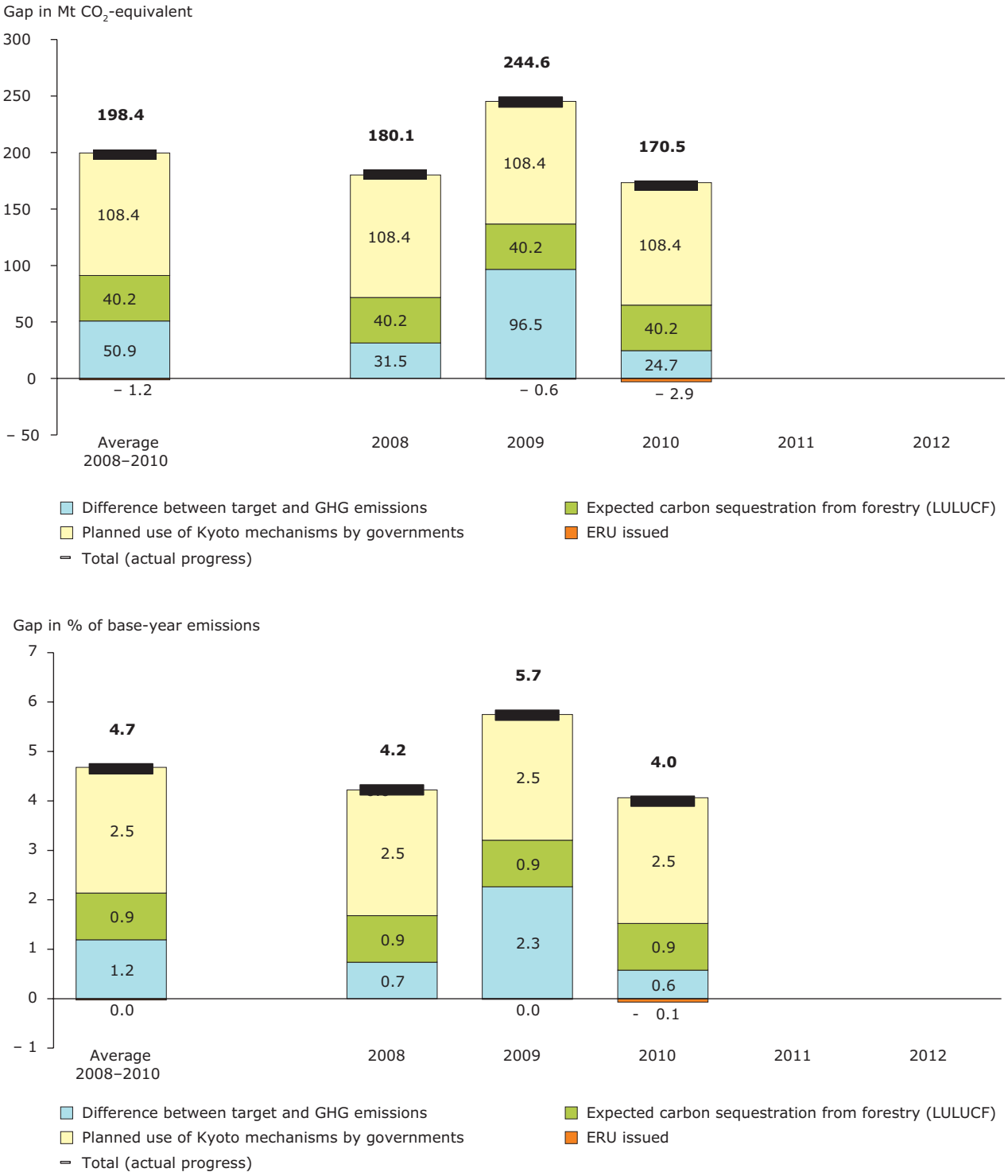
In 2009, there was a very sharp 6.9 % decrease of GHG emissions in the EU-15 compared to 2008, largely as a result of the economic recession (but also sustained strong growth in renewable energy). Alongside falling energy demand linked to the economic recession, there was a strong growth in renewable energy deployment, particularly biomass, wind and solar, leading to a significant increase in the share of renewables in electricity production. Hence, although emissions decreased in all emitting sectors, the largest emission reductions occurred in sectors covered by the EU ETS, where the decrease reached more than 11 %, while by contrast non-ETS emissions decreased 'only' by 3.7 %. In absolute values, the ETS reduction was twice that of non-ETS sectors. The consequences of the economic recession in terms of progress towards the EU-15 Kyoto target were therefore somewhat less important than what could be expected at first sight, since the trends of EU ETS do not affect such progress.

Based on the approximated EU GHG inventory for 2010, GHG emissions increased by 2.35 % in 2010 compared to 2009 for the EU-15, mainly due to the recovery from economic recession which led to substantial emission reductions in 2008 and 2009 in all Member States. The largest absolute emission increase occurred in the energy sector, which shows a growth of 77.3 Mt CO_2 equivalent for the EU-15 — equivalent to an increase in emissions of 2.6 %. This growth in emissions in the energy sector reflects the increase of gross inland energy consumption of fossil fuels in the EU-27 in 2010 ([21]).

Besides, the number of allocated allowances to ETS operators also increased in 2009 compared to 2008 and again in 2010 compared to 2009. The non-ETS emission target was therefore reduced in 2010 compared to 2009, which lessened the effect of the GHG reduction in non-ETS sectors. Overall, EU-15 non-ETS emissions were lower than the EU-15 non-ETS target (initial AAUs minus allocated allowances) in 2009 but this overachievement was decreased slightly in 2010.

([21]) Approximated EU GHG inventory: Early estimates for 2010, calculated by EEA, the report will be published by October, see http://www.eea.europa.eu/themes/climate online.

Figure 3.9 Actual progress of the EU-15 towards its burden-sharing target in absolute and relative terms



Note: The X-axis (0 % line) corresponds to the achievement of the EU-15 reduction target under the Kyoto Protocol (– 8 % compared to base-year emissions).

Positive values correspond to contributions to the achievement of the EU-15 Kyoto target, while negative values represent shortfalls.

The difference between target and GHG emissions concerns the sectors not covered by the EU ETS, which represent the right emissions and target to consider for the assessment of actual progress towards Kyoto targets.

Source: EEA, 2011a; EEA, 2011b; EEA, 2011d, EEA, 2011e.

Table 3.3 Overview of input data for EU-15 for the calculation of the gap between 2008–2010 GHG emissions and targets for the sectors not covered by the EU ETS

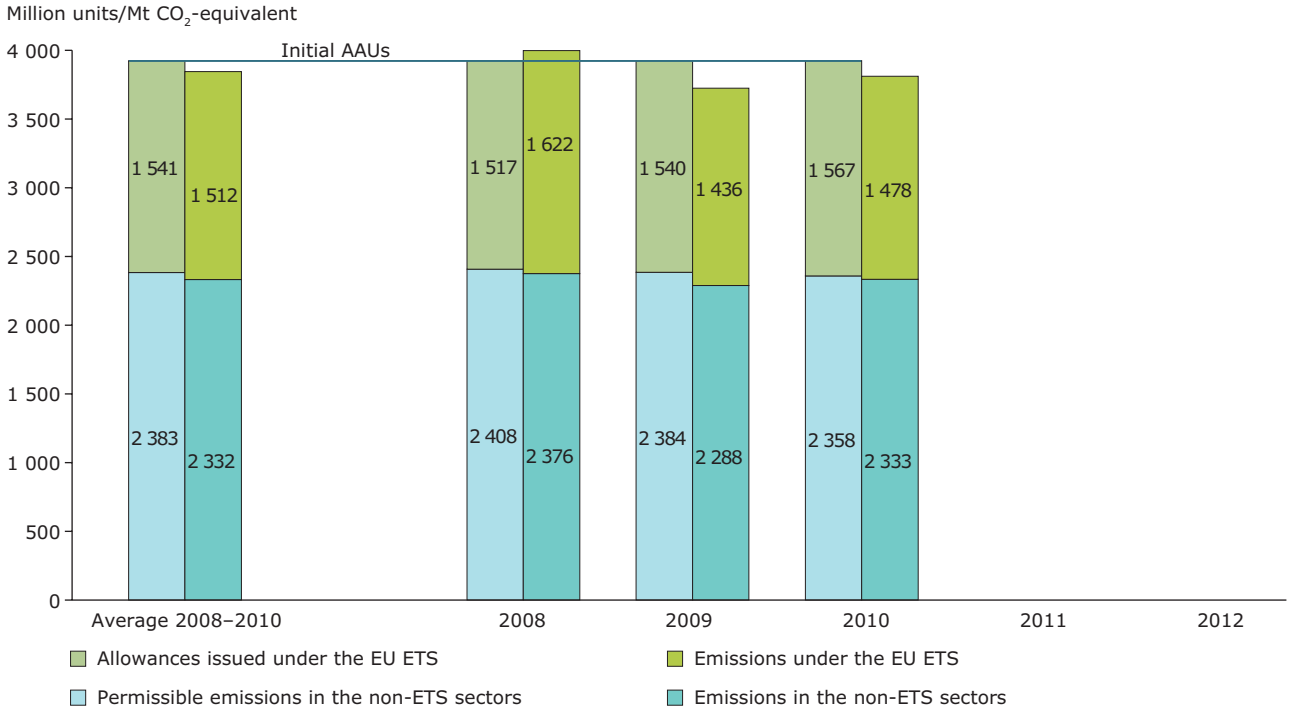
EU-15		2008 (M EUA)	2009 (M EUA)	2010 (M EUA)	Average 2008–2010 (M EUA)
1	Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks) (3) – [(4) + (10) + (11) – (9)]'	180.1	244.6	170.5	198.4
2	Difference between target and GHG emissions (non-ETS, without Kyoto mechanisms or carbon sinks) (4) – (3)'	31.5	96.5	24.7	50.9
3	Actual Non-ETS GHG emissions (5) – (8)	2 376.1	2 287.6	2 332.9	2 332.2
4	Non-ETS target (6) – (7)	2 407.5	2 384.1	2 357.6	2 383.1
5	Inventory (UNFCCC 2011, 2010 EEA proxy)	3 998.0	3 723.7	3 811.2	3 844.3
6	Initital Assigned Amount (AAUs)	3 924.3	3 924.3	3 924.3	3 924.3
7	Allowances issued under the EU ETS	1 516.7	1 540.2	1 566.7	1 541.2
8	Verified emissions under the EU ETS	1 621.9	1 436.2	1 478.3	1 512.1
9	ERU issued	0.0	0.6	2.9	1.2
10	Planned use of Kyoto mechanisms by governments (AAUs + CERs + ERUs)'	108.4	108.4	108.4	108.4
11	Expected carbon sequestration from forestry (LULUCF) (RMUs)	40.2	40.2	40.2	40.2

Note: Colours given in the first column of the table represent the bars in Figure 3.9). The results are based on the assumption that any surplus by EU Member States could be used for EU compliance.

GHG emissions: 2011 EU GHG inventory submitted to UNFCCC (2008, 2009 total emissions) and EEA estimate (2010 emissions); non-ETS emissions based on total emissions.

Source: EEA, 2011a; EEA, 2011b; EEA, 2011d; EEA, 2011e.

Figure 3.10 ETS and non-ETS emission trends in the EU-15 compared to respective targets, 2008–2010



Note: The non-ETS target values (permissible emissions in the non-ETS sectors) are not constant over the years, due to the annual variation of the number of allocated allowances under the EU ETS, which induces an annual variation of the number of remaining AAUs for the non-ETS sectors.

Source: EEA, 2011a; EEA, 2011b; EEA, 2011d.

4 The EU Emissions Trading Scheme

The EU ETS covers more than 40 % of total GHG emissions in the EU. Emissions of installations covered by the EU ETS increased between 2005 and 2007, declined in 2008 and 2009 and picked up again in 2010. The 2010 levels remain below 2008 levels. Through the second NAPs for the period 2008–2012, participating countries have fixed the overall contribution that the EU ETS will provide towards reaching burden-sharing or Kyoto targets at national level. In the years 2008 to 2010 emissions of all installations covered by the EU ETS were on average 3 % below the total amount of allocated allowances (freely or through auctioning) for the second trading period. Despite the fact that verified emissions were lower than freely allocated allowances, there was a substantial use of CDM credits.

The revised EU ETS will deliver an emission reduction of – 21 % by 2020 compared to 2005 levels. In the near future, the ETS scope will be extended, the cap will decrease continuously from 2013 onwards using a linear reduction factor and an increasing number of allowances will be auctioned. The use of off-sets will be subject to tighter quality restrictions.

4.1 Introduction to the EU ETS

The EU ETS is a key policy instrument to achieve the climate policy objectives in the European community. It was established by Directive 2003/87/EC (the Emission Trading Directive) and entered into force on 1 January 2005.

The role of the EU ETS and in particular the importance of cap setting in its contribution to help Member States reaching their Kyoto targets is described in Section 2.3.

All EU Member States participate in the scheme. Bulgaria and Romania joined the ETS in 2007 as they became Members of the EU. Iceland, Liechtenstein and Norway, which do not belong to the EU, joined the EU ETS in 2008 ([22]) and must comply with the same rules and regulations as the EU Member States. At present, no installation from Iceland falls under the scope of the Directive and consequently no figures for Iceland are reported in this chapter ([23]). This will change in 2012, when aviation will be part of the EU ETS, and in 2013, when aluminium and ferrosilicon production will also be part of it. Switzerland has a separate emissions trading scheme but intends to link its system to the EU ETS. It would operate on the basis of mutual recognition of emission allowances in line with a bilateral agreement which would come into effect in 2013 ([24]).

The EU ETS covers CO_2 emissions from large stationary sources including power and heat generators, oil refineries and installations for the production of ferrous metals, cement, lime, glass and ceramic materials, and pulp and paper (see Table 4.1). Around 11 000 installations are regulated by the EU ETS. In 2009, installations in the EU-27 accounted for approximately 43 % of the EU's total GHG emissions.

A first trading period covered the years 2005–2007, followed by a second trading period corresponding to the Kyoto compliance period 2008–2012. Since 2008, nitrous oxide (N_2O) emissions from installations producing nitric acid may also be opted into the scheme. Until now, only Austria (since 2010), the Netherlands (since 2008) and Norway

([22]) The linkage of the EU emissions trading system with Iceland, Liechtenstein and Norway took place through the incorporation of the EU ETS Directive (Directive 2003/87/EC) into the European Economic Area agreement in 2007.
([23]) See http://www.eftasurv.int/internal-market-affairs/areas-of-competence/environment/emission-trading/ online.
([24]) The amended Swiss CO2 Act — a precondition for the linkage — should also enter into force at that time (see http://www.bafu.admin.ch/emissionshandel/05538/05540/index.html?lang=en).

Table 4.1 Description of the sectors covered by the EU ETS

Sector code	Sector description
1	Combustion installations
2	Mineral oil refineries
3	Coke ovens
4	Metal ore roasting or sintering installations
5	Production of pig iron or steel
6	Production of cement clinker or lime
7	Manufacture of glass including glass fibre
8	Manufacture of ceramic products by firing
9	Production of pulp, paper and board
99	Other activity opted-in

(since 2009) decided to include such installations. Other Member States like France and the United Kingdom are planning to follow. Other sectors (e.g. residential, transport, agriculture and waste) or GHG (CH_4 and F-gases) are not covered by the current scheme. The aviation sector will be fully covered starting from 1 January 2012; emissions of all national or international flights arriving in or departing from the EU will be regulated under the scheme.

The basis of the EU ETS is a 'cap and trade' principle. A total limit (cap) of particular GHG emissions is set for the regulated installations. Operators receive emission allowances from their government based on national allocation rules (e.g. using benchmarks, historic emissions or projected emissions). An amount equivalent to the verified emissions has to be surrendered by the end of April each year. Operators holding more allowances than necessary to cover their verified emissions may either sell unneeded allowances to other operators in the EU who are in need of more allowances, or keep them for future years. Directive 2004/101/EC (the Linking Directive) allows operators to buy credits from JI or CDM projects (see Section 4.4) and to bring them, to a limited extent, into the EU ETS to fulfil their obligations to surrender allowances.

Under the Emission Trading Directive, Member States prepared NAPs for both the first (2005–2007) and second (2008–2012) trading periods, which were submitted for approval by the Commission. The allocation plans include the total quantity of allowances that will be available during a trading period, along with the rules for allocating these allowances to operators, amongst others.

Through the second NAPs for the period 2008–2012, participating countries have fixed the overall contribution that the EU ETS will provide towards reaching burden-sharing or Kyoto targets at national level (see Section 2.3).

The EU ETS was reviewed to achieve a bigger level playing field for operators across the EU. The cap was also strengthened to help the EU achieve stricter emissions targets agreed by EU Heads of State in March 2007, i.e. to cut overall GHG emissions by 20 % compared to 1990 levels by 2020, with a view to increasing this to 30 % in the event a satisfactory international agreement is reached. The Directive 2009/29/EC lays down the amendment to the Emission Trading Directive covering the period after 2013 (see Section 4.5).

The scope of the EU ETS will be extended further as from 2013 to include new sectors and gases, such as CO_2 emissions from petrochemicals, ammonia and aluminium sectors as well as N_2O emissions from the production of nitric and adipic acid and perfluorocarbons (PFC) emissions from aluminium production.

4.2 EU ETS emissions in the second trading period (2008–2010)

In the second trading period ca. 11 000 installations in the 30 participating countries (EU Member States, Iceland, Liechtenstein and Norway) emitted on average 1 982 Mt CO_2-equivalent per year ([25]). Nearly three quarters of the emissions stemmed from combustion installations (72.5 %; see Figure 4.1); emissions from fossil fuel power plants are covered in this ETS sector. Emissions from the production of cement clinker or lime accounted for 8 %; mineral oil refineries emitted 7 % and the production of pig iron or steel 6 %. The contribution of the other sectors was 0.5 % to 1.5 % on average in 2008–2010.

([25]) No data on verified emissions 2010 were published at the time of writing for Cyprus. The gap was filled using average emissions 2005–2010 for the sectors. These are: Combustion installations: 3.8 Mt CO_2-equivalent; Cement clinker or lime: 1.4 Mt CO_2-equivalent; and Ceramic products by firing: 0.1 Mt CO_2-equivalent. No installation in Iceland falls under the current scope of the EU ETS Directive.

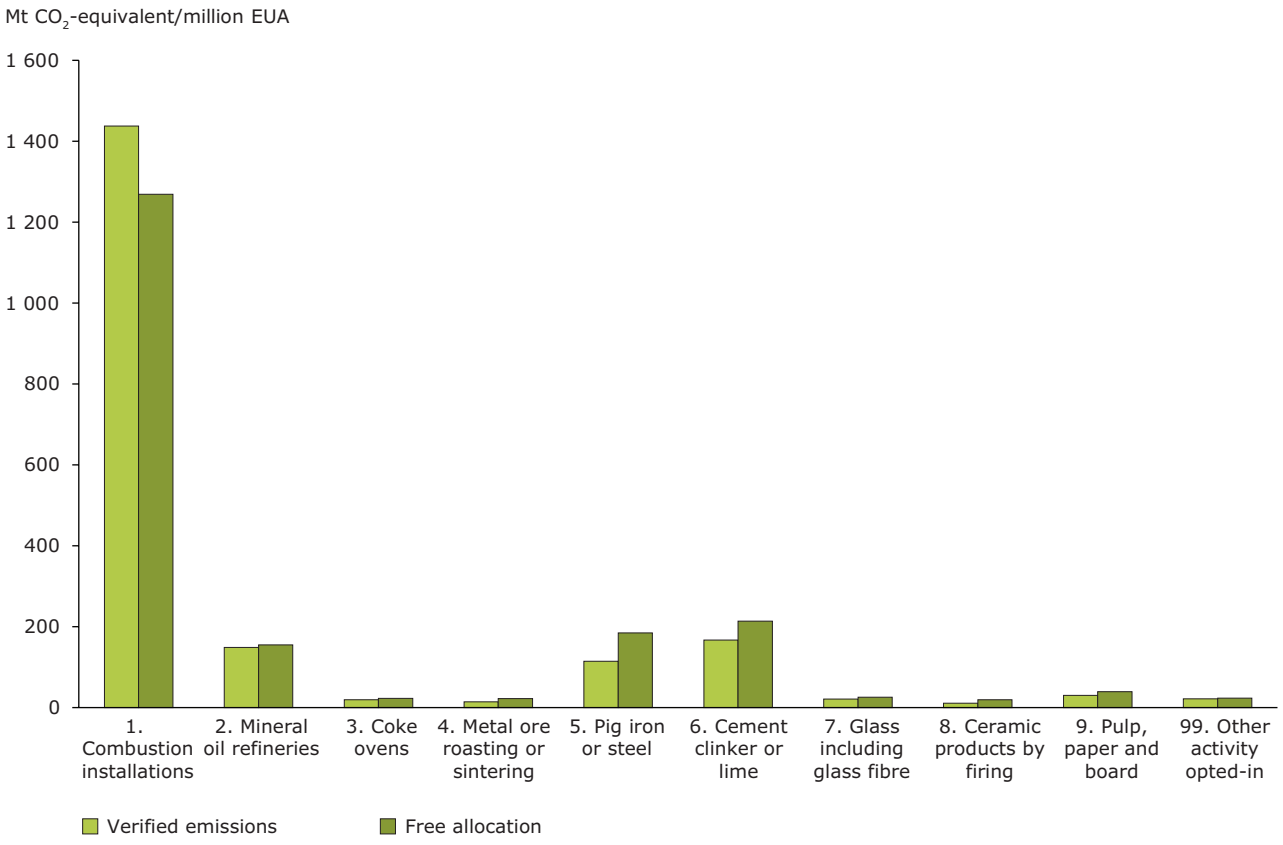
On average for the period 2008–2010, free allocation of allowances covered 99.5 % of total emissions in the trading sector of all participating countries. Whereas free allowances received by combustion installations covered on average 88 % of their emissions, all industrial sectors received more allowances than needed to surrender for their emissions.

When assessing the development over the years, verified emissions are significantly lower in the second trading period than in the first one. Figure 4.2 compares the verified emissions in all countries participating in the EU ETS with the amount of available emission units (EUAs, CERs and ERUs).

From 2005 to 2007, verified emissions of all EU ETS installations increased slightly by 20 Mt CO_2 (taking into account the change in scope/coverage to include emissions from the installations that entered the EU ETS after 2005 ([26])). Due to the economic crisis, emissions declined in 2008 (4 % below 2005 levels) and in 2009 (16 % below 2005 levels). In 2010 emissions started to rise again, but are still 13 % below 2005 levels.

The first trading period was marked by an oversupply of EU allowances. EU ETS countries issued more allowances than needed to cover emissions in the trading sector, which resulted in a fall of allowance prices (see also Section 4.3). Auctioning played a negligible role only. The cap was tightened for the second trading period, the average cap dropping from 2 269 million EUAs per year in the first trading period to 2 045 million per year in the second (see Table 4.2). In addition, operators were allowed to use credits from flexible mechanisms (CDM and JI projects) for compliance. Due to the impact of the economic crisis, emissions

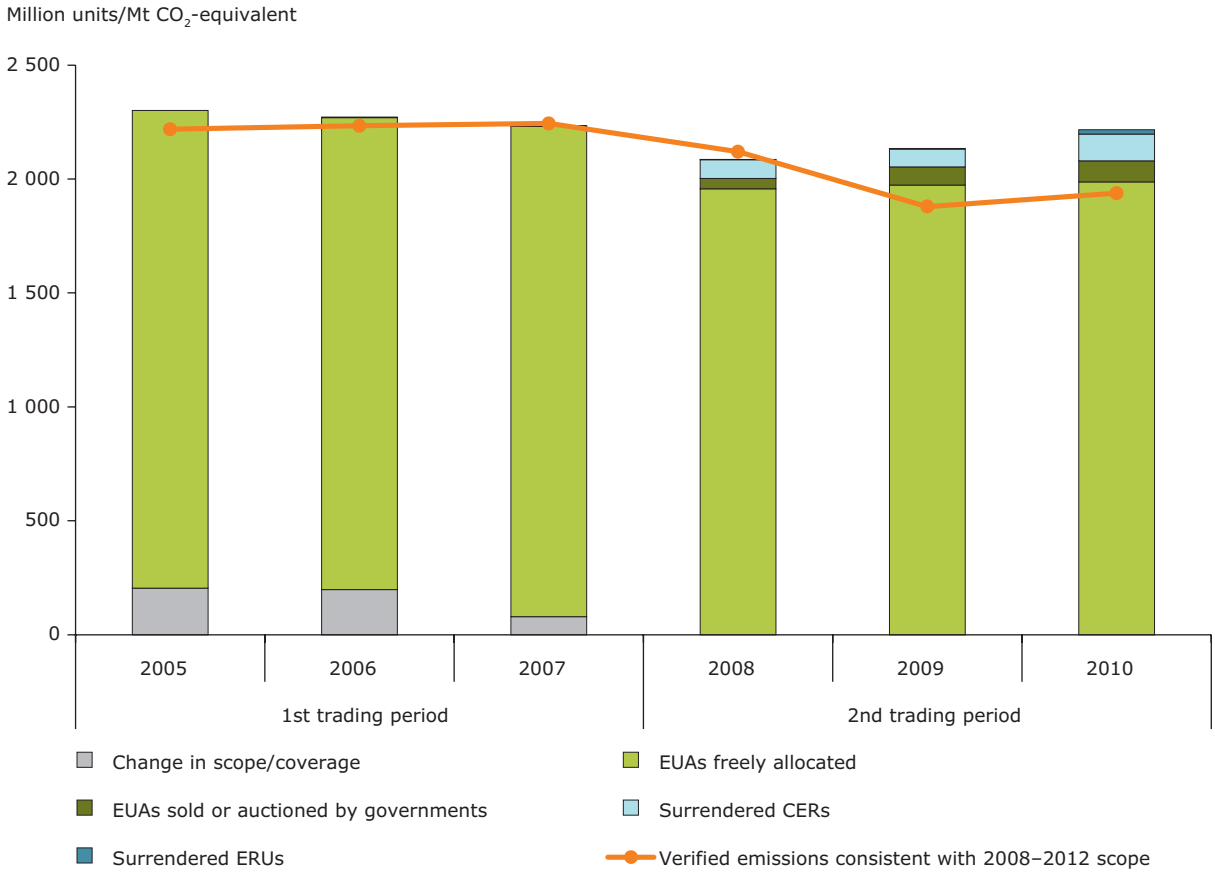
Figure 4.1 Comparison of verified emissions and free allocation (average 2008–2010 for all 30 countries participating in the EU ETS)



Source: EEA, 2011d; gap filling for Cyprus by ETC/ACM.

([26]) 'Change in scope' includes emissions from (a) installations of new countries entering the scheme (Bulgaria and Romania from 2007 onwards, Iceland, Liechtenstein and Norway from 2008 onwards); (b) emissions from installations temporarily exempted (notably United Kingdom); and (c) new installations coming in due to the change in scope between the first and second trading period.

Figure 4.2 Comparison of available emissions units and verified emissions for all 30 countries participating in the EU ETS



Note: The 'change in scope/coverage' concerns the correction from 2005–2007 to 2008–2012. The large corrections for 2005 and 2006 are related to Bulgaria and Romania, which entered the scheme in 2007 only.

Source: EEA, 2011d; Öko-Institut, 2011; gap filling Cyprus by ETC/ACM.

fell below the cap despite the fact it was reduced compared to the first trading period. In 2009 and 2010, the trading sector received more EUAs than needed to cover its emissions these years.

In 2008, verified emissions were 34 Mt CO_2 above the total number of allocated allowances in all EU ETS countries, which means that some operators used their free allocations for the year 2009 to cover their emissions in 2008 (borrowing). In 2009 and 2010, verified emissions were lower than the available emission units, leading to a surplus of 255 million EUAs in 2009 and a surplus of 279 million EUAs in 2010. Overall, operators were able to bank 500 million EUAs during the period 2008 to 2010 for use in later years. When only EU-15 Member States are considered, verified emissions were 49 Mt CO_2-equivalent higher than the amount of available allowances in 2008, 182 Mt CO_2-equivalent lower in 2009 and 157 Mt CO_2-equivalent lower in 2010.

Furthermore, despite the fact that total emissions were lower than their cap on average, a substantial use of CERs generated by CDM projects was made during the period 2008–2010. ERUs from JI projects played a less important role. Operators in all EU ETS countries used jointly 277 million CERs and 23 million ERUs. Many operators have used CDM credits for compliance in the latest years and will bank unused EUAs that can be used for compliance in later years or even the next trading period.

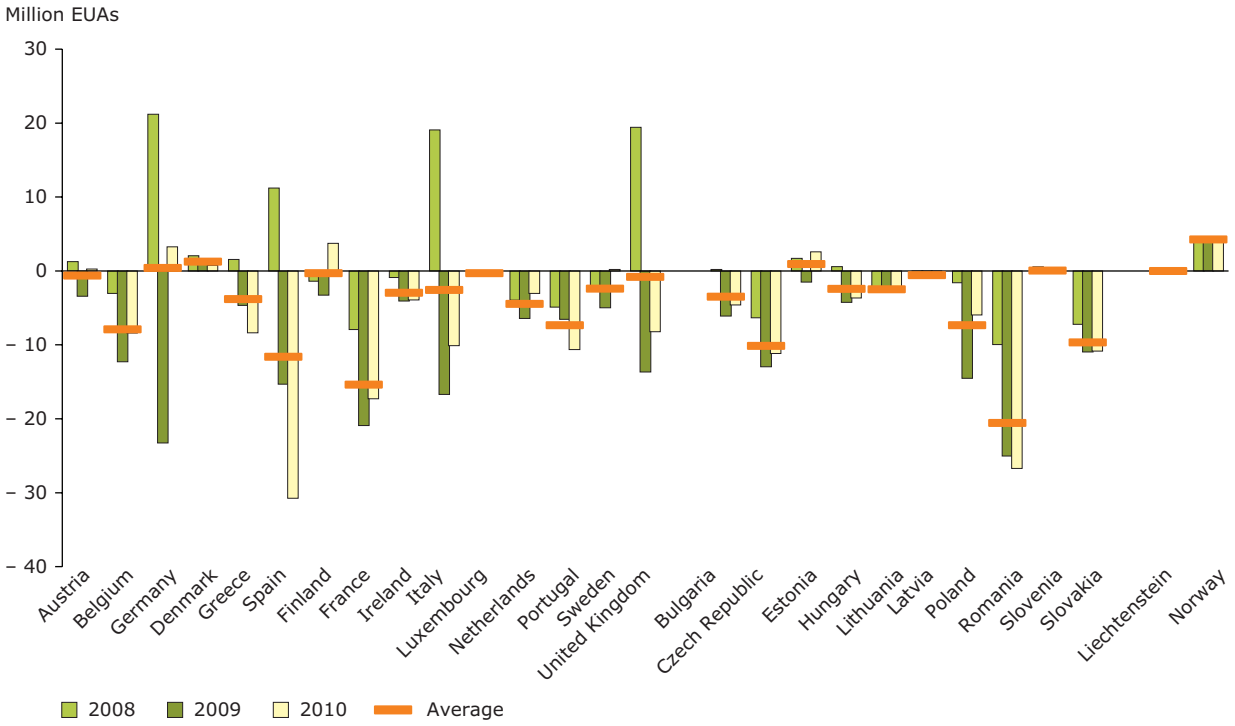
Verified emissions were higher than the caps for all three years of the period 2008–2010 only in Denmark and Norway (see Figure 4.3). In Germany, Estonia and Slovenia, average emissions were slightly above the cap. The effect from the economic crisis can clearly be seen in the differences among years.

Table 4.2 Comparison of available allowances and verified emissions in all 30 EU ETS countries, 2005–2010

All 30 countries participating to the EU ETS	Unit	1st trading period			2nd trading period		
		2005	2006	2007	2008	2009	2010
EUAs freely allocated	Million EUAs	2 096	2 072	2 153	1 958	1 974	1 988
EUAs sold or auctioned by governments	Million EUAs	0	2	2	45	79	92
Change in scope/coverage	Mt CO_2	204	198	79			
Available EUAs (scope ETS II)	Million EUAs	2 301	2 272	2 234	2 003	2 053	2 080
Surrendered CERs	Million CER				82	78	117
Surrendered ERUs	Million ERU				0	3	20
Available credits	Million credits	2 301	2 272	2 234	2 085	2 134	2 217
Verified emissions	Mt CO_2	2 014	2 036	2 165	2 120	1 879	1 938
Change in scope/coverage	Mt CO_2	204	198	79			
Verified emissions consistent with 2008–2012 scope	Mt CO_2	2 218	2 234	2 244	2 120	1 879	1 938
Shortage/surplus	Million EUA	82	39	– 10	– 34	255	279
Cumulated shortage/surplus Phase II	Million EUA				– 34	221	500

Source: EEA, 2011d; Öko-Institut, 2011; gap filling for Cyprus by ETC/ACM; information on transfers of Kyoto units as reported under the KP.

Figure 4.3 Difference between verified emissions and caps in all 30 countries participating in the EU ETS, 2008–2010



Note: A positive sign indicates that verified emissions (2008, 2009, 2010 and 2008/2010 average) were higher than available allowances (i.e. the EU ETS helps the Member State to reach its Kyoto target). A negative sign indicates that verified emissions were lower than available allowances (i.e. the EU ETS does not help the Member State to reach its Kyoto target).

Source: EEA, 2011d; European Commission, 2011 (see: http://ec.europa.eu/clima/documentation/ets/allocation_2008_en.htm).

In 2008, verified emissions were above the cap in 13 countries, whereas in 2009 this situation occurred in only 2 countries (Denmark and Norway).

The economic crisis had a greater effect on emissions in the emissions trading sector than in other sectors such as transport, residential, agriculture and forestry. Therefore, the crisis reduced de facto the level of ambition initially defined through the cap levels.

4.3 Price development

In the first trading period; the price for 1 tonne of CO_2 started at around EUR 7 per EUA, rising later to a maximum of over EUR 30 per EUA mainly due to limited liquidity in the market. At this time the power sector faced rising gas prices that incentivised a switch to coal power production; as a consequence emissions increased and thus the sector faced a shortage of allowances. Given that only the power sector was actively trading in this period, market participants wrongly assumed that there was an overall shortage in the supply of allowances (Egenhofer et al., 2011). The allowances price dropped sharply after the publication of the first verified emissions in April 2006 to below EUR 10 per EUA. The warm winter of 2006/2007 confirmed that overall emissions would be less than allocations and the EU carbon market for the period 2005–2007 would remain long because of the impossibility to bank unused allowances from the first to the second phase; as a result the price dropped to below EUR 1 per EUA in spring 2007 (see Figure 4.4; EUA 2007 (blue line)).

Until the end of 2006, the prices for EUAs for both trading period were of a comparable magnitude. With the Commission's decision on the NAPs for the second trading period market participants expected that, even though allowances of the first trading period lost their value due to the excess of free allocation, the situation would be different in the second trading period. Prices decoupled and the value of 2009 EUAs rose up to nearly EUR 30 in July 2008. Due to the economic crisis, the production of industrial products as well as the demand for electricity and consequently the emissions fell in autumn and winter 2008. Since spring 2009, the prices for EUA have remained at round about EUR 15 for over two years. Currently prices have dropped to EUR 12. The publication of emission data for 2009 and 2010 in April of the consecutive year has had no disruptive effect on the allowance price, even though it became clear that verified emissions were below the amount of allocated allowances.

The possibility of banking from the second to third trading period has a stabilising effect on carbon prices

Figure 4.4 EUA future prices 2005–2011

Source: Point Carbon, 2009.

during the second period when an overall shortage of allowances is expected in the third period. Banking of unused allowances from the second to the third trading period will therefore increase the number of allowances available for compliance in the third period.

Besides a large number of factors such as primary energy prices, climatic conditions, industrial production, etc., carbon prices can potentially be affected by regulatory and policy developments in other areas, for example the implementation of measures targeting energy demand such as energy efficiency measures. Such measures may substantially impact the demand for allowances, and as such could reduce the carbon price signal. As a consequence, investment in low-carbon technologies and renewable energy would be less economically attractive. In the context of the proposed Energy Efficiency Directive, the Commission has proposed to monitor the impact of new energy efficiency measures on the EU ETS.

4.4 Use of JI and CDM by operators

As part of the second NAPs, Member States had to set a limit on the maximum use of project-based credits by operators. The project-based mechanisms played no major role in the first trading period of the ETS, mainly due to low allowance prices in 2006 and 2007 and the outstanding link between the EU registries system and the Independent Transaction Log of the Kyoto Protocol (ITL) ([27]). The use of CDM and JI credits gained importance in the second trading period. The use of credits generated by forestry activities through Kyoto mechanisms is not allowed within the EU ETS.

In total, up to 270.5 million CERs ([28]) or ERUs ([29]) may be used per year by ETS installations from all participating countries except Estonia in the second trading period (see Table 4.3). This corresponds to 13.7 % of the total cap (all 30 countries) for the second trading period. If project credits were used up to the extent allowed, CO_2 emissions by ETS installations could increase in the second trading period by 3.8 % or 83.9 Mt CO_2 per year ([30]) above the verified emissions in 2005/2007 (including additional emissions from installations that are only in the second trading period covered under the ETS). However, the limits for the use of JI and CDM credits represent an upper boundary and they may not be completely used in the period from 2008 to 2012. Furthermore, the reviewed ETS Directive allows operators to use the total number of CDM and JI credits that was allowed to them initially in the period from 2008 to 2012 in the total period from 2008 to 2020. Lastly, the economic crisis results in lower emissions, which reduces the need to buy CDM and JI credits.

In the years 2008–2010, 5 % of verified emissions (299 Mt CO_2-equivalent) were covered by surrendering CERs and ERUs. Most certificates (276 million) originated from projects in non-Annex 1 countries, i.e. the developing world (CERs). Certificates from JI projects were used to a much lesser extent (8 % of total credits from flexible mechanisms; 23.2 million ERUs). Operators in Lithuania used credits from flexible mechanisms to cover 16 % of their emissions, followed by Slovakia (11 %), and Latvia and Spain (10 % each). Only in Estonia, Liechtenstein and Malta were no CERs/ERUs surrendered.

In the first three years of the trading period; 22 % of the amount of allowable off-sets has been used. This figure differs significantly from country to country. Norwegian operators have already made use of almost the complete allowed amount (96 %). The share of free allocation compared to emissions is considerably lower in Norway than in all the other participating countries (Norwegian operators of combustion installations received only 18 % of their actual 2008–2010 emissions as free allocation). Whereas the EU Member States are bound by the Emission Trading Directive which foresees at least 90 % of free allocation in the second trading phase, Norway could choose to apply stricter standards. In 19 out of the 30 participating countries the free allocation in phase II has surpassed actual emissions in 2008 to 2010, whereas in Norway operators of combustion installations received only 18 % of their actual emissions as free allocation. Apart from Norway, only in Slovakia more than the yearly average of admissible credits from flexible mechanisms were used; most countries stayed way below the allowed usage.

In absolute figures, most credits from flexible mechanisms were used by operators in Germany (88.0 million), Spain (41.7 million), Poland

([27]) The ITL is operated by the UNFCCC secretariat. The link between the CITL and the ITL only operates during the Kyoto period.
([28]) CERs apply to emission reductions under the CDM.
([29]) ERUs apply to emission reductions under the JI.
([30]) Calculation method: Average of available EUAs (free allocation and auctioning) + allowable off-sets (annually) – average emissions in the first trading period.

Table 4.3 Limit on the use of JI and CDM credits by EU ETS operators

Country	Verified emissions (average 2008–2010)	Free allocation (average 2008–2010)	Allowed CER/ERU use (% of free allocation)	Total allowed CER/ERU use in phase II	CER/ERU surrendered by operators 2008–2010	Used CER/ERU-budget
	Mt CO_2e	M EUA	%	M CER/ERU	M CER/ERU	%
Austria	30.1	31.6	10	15.8	2.7	17
Belgium	50.6	56.1	8	23.5	2.8	12
Bulgaria	34.6	38.0	13	23.8	3.0	13
Cyprus	3.6	5.1	10	2.5	0.3	12
Czech Republic	76.6	85.9	10	42.9	10.3	24
Denmark	25.8	23.9	17	20.4	1.4	7
Estonia	12.8	11.8	0	0.0	0.0	-
Finland	37.3	37.2	10	18.6	2.6	14
France	116.6	129.5	14	87.4	15.1	17
Germany	451.9	393.7	22	433.0	88.0	20
Greece	64.5	63.9	9	28.7	4.0	14
Hungary	24.2	24.9	10	12.5	4.7	38
Ireland	18.3	20.3	10	10.2	2.1	20
Italy	199.0	207.1	15	155.2	29.3	19
Latvia	2.8	3.3	10	1.7	0.8	49
Liechtenstein	0.0	0.0	11	0.0	0.0	-
Lithuania	6.1	7.7	20	7.7	2.8	37
Luxembourg	2.2	2.5	10	1.2	0.3	24
Malta	1.9	2.1	10	1.1	0.0	-
Netherlands	83.0	81.8	10	40.9	4.8	12
Norway	19.3	7.8	11	4.3	4.1	96
Poland	198.3	202.8	10	101.4	30.9	30
Portugal	27.5	31.4	10	15.7	5.1	33
Romania	53.5	73.5	10	36.8	13.1	36
Slovakia	22.9	32.2	7	11.3	7.7	68
Slovenia	8.4	8.2	16	6.5	1.8	28
Spain	140.6	151.6	20	151.6	41.7	27
Sweden	20.1	21.8	10	10.9	1.8	17
United Kingdom	244.8	217.5	8	87.0	17.5	20
EU-15	1 512.1	1 469.6	15	1 100.1	219.1	20
EU-27	1 957.8	1 965.3	14	1 348.2	294.6	22
All EU ETS countries	1 977.1	1 973	13.7	1 352.5	298.8	22

Source: EEA, 2011d; EEA, 2009; European Commission, 2011 (see: http://ec.europa.eu/clima/documentation/ets/allocation_2008_en.htm).

(30.9 million) and Italy (29.3 million), with those four countries together having accounted for 64 % of the CERs and ERUs used (see Figure 4.5).

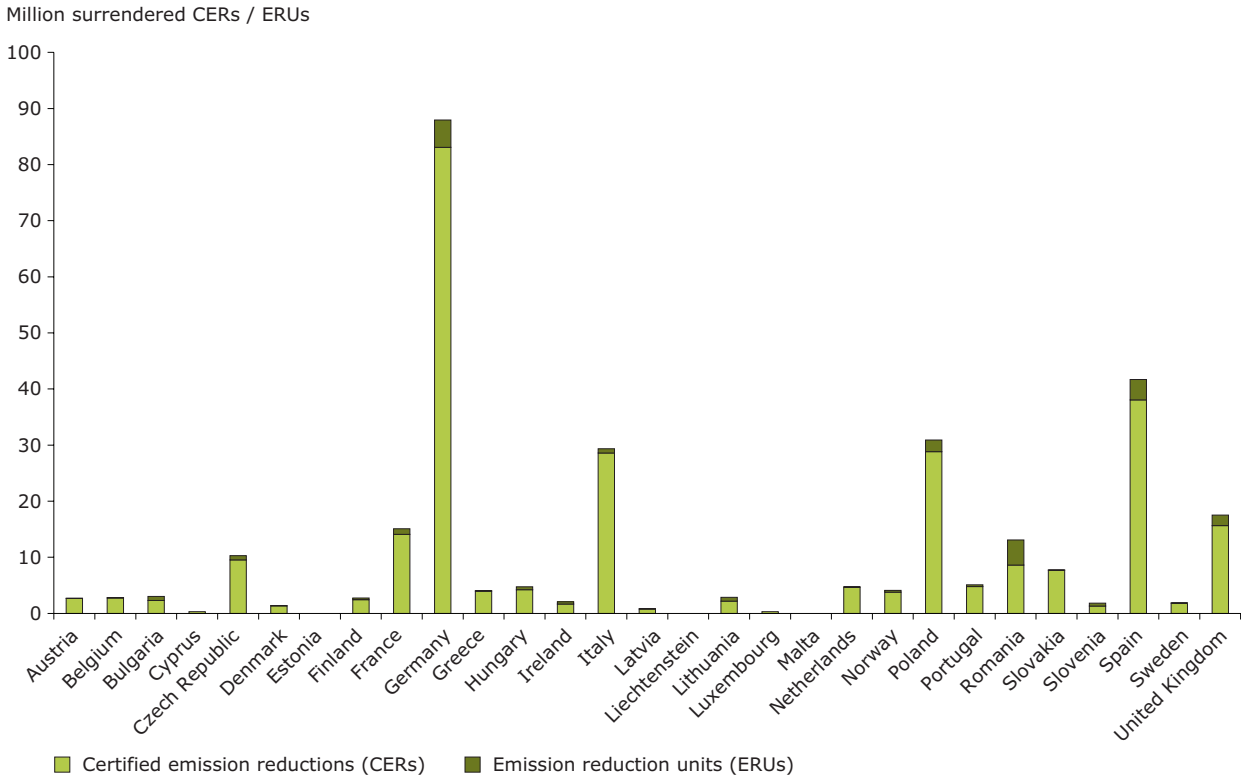
4.5 Outlook to the third trading period (2013–2020)

The EU ETS has been growing in coverage ever since its introduction and will continue to do so. In 2012, the last year of the second trading period, aviation will come into the scheme. From 2013 onwards more CO_2 emissions from installations producing bulk organic chemicals, hydrogen, ammonia and aluminium will be included. Additionally N_2O emissions from the production of nitric, adipic glyoxal and glyoxylic acid, and PFC from the aluminium sector will be included.

The third trading period will last eight years and both cap setting and rules for free allocation are set at European level rather than by EU Member States. The cap will decrease continuously from 2013 onwards using a linear reduction factor (see Figure 4.6). Auctioning will play a much greater role than in the past, while the share of free allocation will decline over time. Allocation will be based on EU-wide harmonised allocation rules.

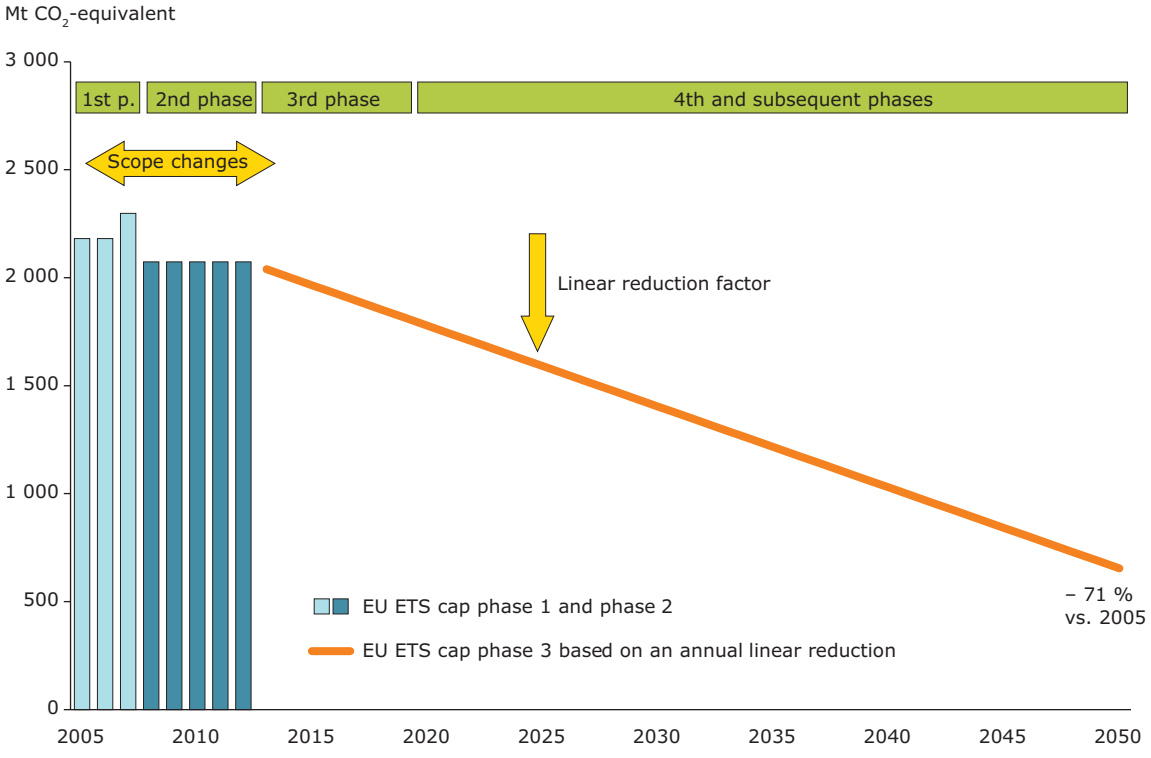
For the use of off-sets tighter quality restriction will apply. Currently, the EU legislation excludes JI/CDM credits from nuclear projects and temporary forest credits; for large hydro projects certain conditions apply. From 2013 onwards, credits from CDM and JI projects destructing trifluoromethane (HFC-23) and N_2O from adipic acid production will not be allowed to be used for compliance in the EU ETS anymore.

Figure 4.5 Credits from CDM & JI surrendered for 2008–2010



Source: EEA, 2011d, EU ETS data viewer.

Figure 4.6 Perspective on EU ETS cap until 2050



Source: Öko-Institut 2011.

5 Projected progress of the EU-15 towards its Kyoto target

Based on current emission levels and the most recent national projections submitted by Member States, the EU-15 is expected to overachieve its Kyoto target over the full KP's first commitment period 2008–2012 by an average gap of 198 to 217 Mt CO_2-equivalent per year, which represents 4.6 % to 5.1 % of its total base-year emissions. This range represents the potential realisation of additional measures by Member States in the sectors not covered by the EU ETS. The gap between domestic GHG emissions and their target in the non-ETS sectors is projected to represent 50 to 69 Mt CO_2-equivalent per year (1.2 to 1.6 percentage points) while total removals from carbon sink activities (LULUCF) are expected to account for an additional 40 Mt CO_2-equivalent (0.9 percentage points) and the use of Kyoto mechanisms by governments would represent an additional reduction of 108 Mt CO_2-equivalent (2.5 percentage points).

Like for the assessment of current progress (based on 2008–2010 emission levels only), these results take into account all surplus Kyoto units projected by Member States (resulting from target overdelivery). This is an optimistic assumption since there is no certainty that surplus AAUs held by EU-15 Member States by the end of the commitment period will be retired or transferred through the flexible mechanisms, to be subsequently retired, either to another EU-15 Member State or to the European Union. Compliance of the EU-15 will depend on the achievement of their individual targets by all its 15 Member States: all Member States must achieve their own burden-sharing targets for the EU-15 to be certain to achieve compliance under the Kyoto Protocol.

If the projected overdelivery of Member States was not taken into account (i.e. no surplus AAUs were to be available for EU-15 compliance) and no further action was taken by the Member States for which projections currently indicate that they will not reach their target, the EU-15 could miss its target, by a gap lower than 10 Mt CO_2-equivalent (0.2 % of base-year emissions). This shortfall represents the sum of the gaps left by those Member States missing their own target.

5.1 Total EU-15 GHG emission trends

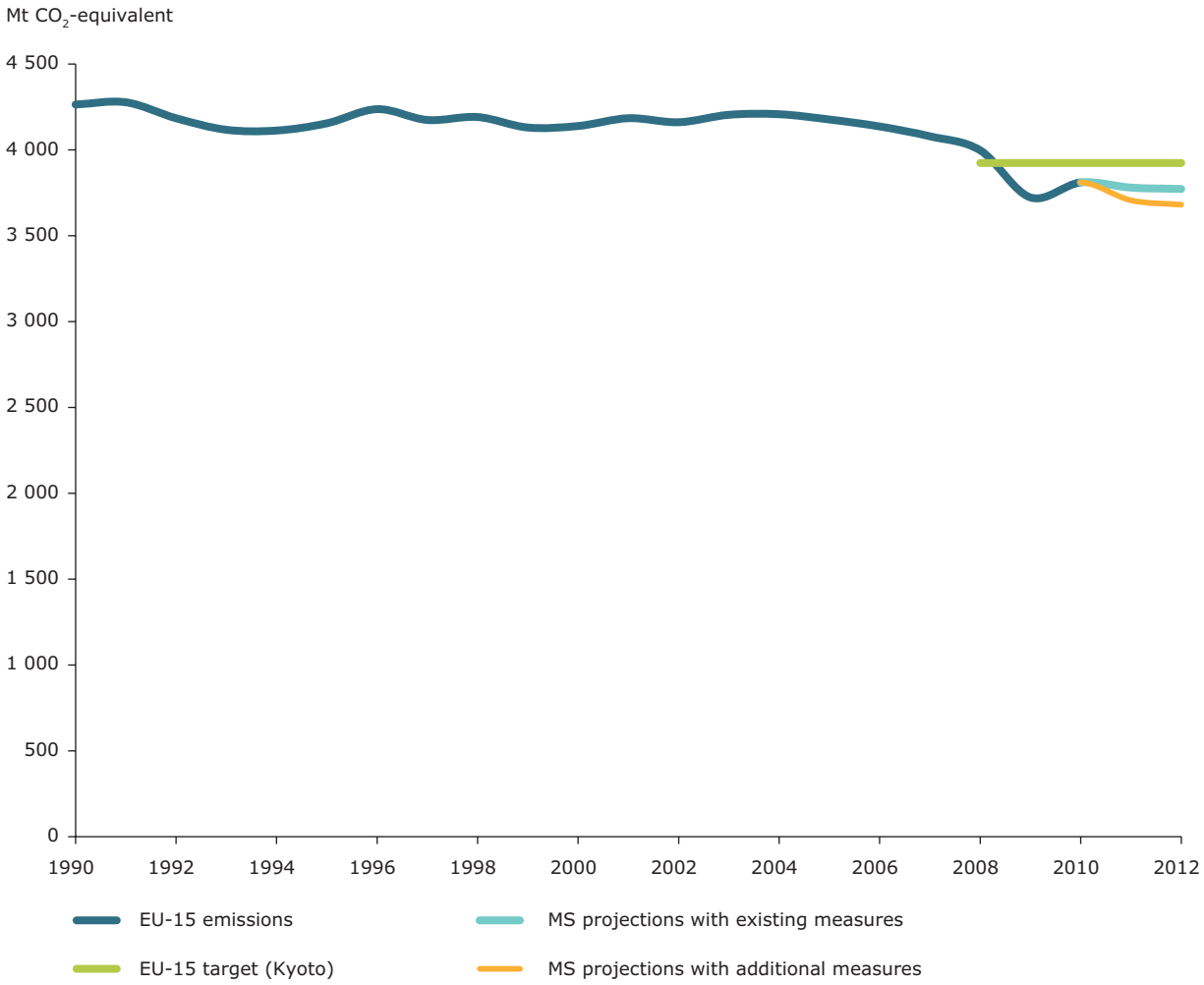
Based on the latest GHG inventory information from May 2011 submitted to the UNFCCC, 2009 GHG emissions in the EU-15 were 6.9 % lower than in 2008. According to early EEA, emissions increased in 2010, with a 2.3 % overall increase compared to 2009 levels. Therefore, 2010 levels were 10.7 % below base-year emissions. This increase in 2010 was mostly due to the recovery from economic recession. In 2010 the winter was colder than in the previous year, leading to a higher heating demand and higher emissions from the residential and commercial sectors. For the second consecutive year, GHG emission levels of the EU-15 exceeded its Kyoto commitment to an 8 % reduction.

The current projections from Member States for the remaining years of the first commitment period (2011–2012) suggest that with the existing measures in place, GHG emissions in the EU-15 will be on average 10.5 % below base-year levels (see Figure 5.1). Emissions are projected to slightly decrease from 2010 levels, by an average 0.5 % per year in 2011 and 2012. Additional measures could lead to further emission reductions between 2010 and 2012.

5.2 Assessment of projected progress

As explained in Chapters 2 and 3, the assessment of progress towards the EU-15's Kyoto target must factor in a number of parameters which affect the EU-15's assigned amount available for compliance, independently from the projection scenario (WEM or WAM) considered the:

Figure 5.1 Trends and projections of EU-15 total GHG emissions



Note: Emissions from international aviation and maritime transport, not covered by the Kyoto Protocol, are not included in the total emissions presented in this figure.

Source: EEA, 2011a.

- role of the EU ETS in Member States' achievement of their individual targets, which makes emissions in the non-ETS sectors the relevant progress indicator to monitor once ETS caps are determined;
- carbon removals due to LULUCF activities;
- use of flexible mechanisms;
- possibility for Member States to retain any surplus AAUs resulting from overdelivery of their own target (see Section 2.3).

A successive combination of these parameters and a comparison of the resulting targets with WEM and WAM projections from Member States allow a refined approach of the EU-15's projected progress towards its Kyoto target (see Table 5.1 and Figure 4.2).

When emissions from the sectors outside the EU ETS are taken together in the EU-15, Member States' projections indicate that they will be on average lower than the average target for these sectors ([31]) by a gap equivalent to 2.1 % to 2.9 % of base-year emissions, depending on the scenario considered (including or not the measures still at planning stage).

The consideration of expected net carbon removals from LULUCF activities and of additional Kyoto units procured through the use of flexible

([31]) Initial EU-15 assigned amount minus units allocated to the EU ETS.

Table 5.1 Gaps between EU-15 GHG emissions and Kyoto target in the non-ETS sectors

Gap between projected emissions in the sectors not covered by the EU ETS and relevant targets	Gap WEM		Gap WAM	
	Mt CO_2-equivalent	% of base-year emissions	Mt CO_2-equivalent	% of base-year emissions
Gap between projected non-ETS emissions and average non-ETS target (domestic emissions)	49.5	1.2 %	68.7	1.6 %
Gap between projected non-ETS emissions and average non-ETS target, including planned use of carbon sinks and flexible mechanisms	198.2	4.6 %	217.4	5.1 %
Gap between projected non-ETS emissions and average non-ETS target, including planned use of carbon sinks and flexible mechanisms, without accounting for surplus AAUs from target overdeliveries	– 9.6	– 0.2 %	– 8.3	– 0.2 %

Note: The average non-ETS target corresponds to the average annual permissible in the sectors not covered by the EU ETS, calculated as the initial EU-15 assigned amount minus the amount of allowances to be allocated under the EU ETS over the full commitment period. Permissible emissions can be calculated to take into account the use of carbon sinks and flexible mechanisms, which will increase the EU-15 assigned amount. Excluding the overdelivery projected by Member States results in lowering permissible emissions.

Source: EEA, 2011a.

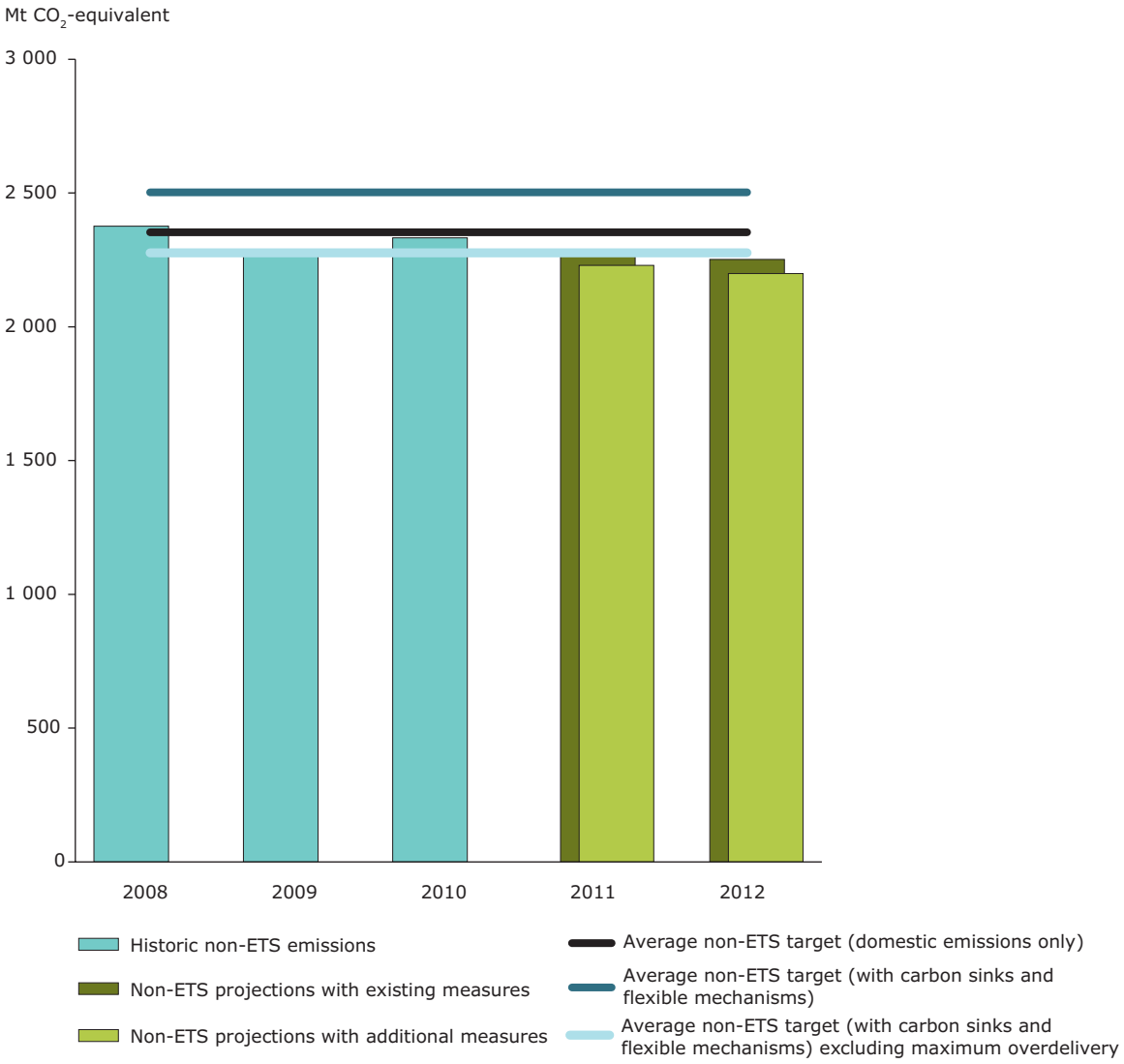
mechanisms would increase these gaps and result in a total overdelivery of 4.6 to 5.1 percentage points on top of the 8 % overall reduction target, corresponding to a net absolute surplus of 198 to 217 million AAUs at government level. Total removals from carbon sink activities (LULUCF) are expected to deliver an emission reduction of 40 Mt CO_2-equivalent (0.9 % of base-year emissions) and the use of the Kyoto mechanisms by governments would represent a further reduction of 108 Mt CO_2-equivalent (2.5 % of base-year emissions). Taking these elements into account, the EU-15 could achieve a total reduction well beyond its target.

Like for the assessment of current progress (based on 2008–2010 emission levels only), these results take into account all surplus Kyoto units projected by Member States (resulting from target overdelivery). This is an optimistic assumption, since there is no certainty that surplus AAUs held by EU-15 Member States by the end of the commitment period will be retired or transferred through the flexible mechanisms, to be subsequently retired, either to another EU-15 Member State or to the European Union. In the United Kingdom, for example, the Carbon Accounting Regulations ensure that any carbon units, in the carbon credit account, in excess of the United Kingdom first carbon budget (which requires greater emissions reductions than the country's Kyoto target) are cancelled and therefore not used to offset GHG emissions in the United Kingdom or elsewhere during the first commitment period 2008–2012.

Therefore in principle, compliance of the EU-15 will depend on the compliance of all its 15 Member States: all Member States must achieve their own burden-sharing target for the EU-15 to be certain to achieve compliance under the Kyoto Protocol.

If the projected overdelivery of Member States was not taken into account (i.e. no surplus AAUs were to be available for EU-15 compliance), the EU-15 would be left with a gap to fill equivalent to less than 10 Mt CO_2-equivalent (0.2 % of base-year emissions). This shortfall represents the sum of the gaps left by the Member States for which projections indicate that they will not reach their target, which are the same countries identified as not on track in the assessment of current progress (Italy, Luxembourg and Austria — see Section 3.4.1).

Figure 5.2 Non-ETS projections in the EU-15 compared to different target scenarios



Note: The average non-ETS target corresponds to the average annual permissible in the sectors not covered by the EU ETS, calculated as the initial EU-15 assigned amount minus the amount of allowances to be allocated under the EU ETS over the full commitment period. Permissible emissions can be calculated to take into account the use of carbon sinks and flexible mechanisms, which will increase the EU-15 assigned amount. Excluding the overdelivery projected by Member States results in lowering permissible emissions.

Source: EEA, 2011a.

6 Projected progress towards 2020 targets

Based on recent EEA estimates, after an important drop in 2009 due to the economic recession, total EU GHG emissions increased in 2010 and stood approximately 15.5 % below their 1990 levels (about 14 % if emissions from international aviation are taken into account). However, 2010 emissions remained 5 % below 2008 levels. Projections from Member States indicate that total EU emissions will not be significantly reduced until 2020: with the current set of national domestic measures in place, the EU will reach in 2020 a level 19 % below 1990 levels, close to its 20 % reduction target. The gap of 1 percentage point could be filled and the target overachieved by 5 points if Member States would implement all additional measures currently at planning stage, in particular in the transport and residential sectors.

At national level, projections show that 11 Member States (Bulgaria, the Czech Republic, Estonia, France, Latvia, Hungary, the Netherlands, Poland, Portugal, Romania and the United Kingdom) could achieve their individual 2020 target in the sectors not covered by the EU ETS with the current set of domestic policies and measures, while 7 additional Member States (Germany, Spain, Italy, Cyprus, Austria, Slovenia and Finland) would achieve their target through implementation of additional measures. A remaining nine Member States (Belgium, Denmark, Ireland, Greece, Lithuania, Luxembourg, Malta, Slovakia and Sweden) would not achieve their targets through domestic emission reductions only, despite the implementation of currently planned measures. However, Member States could still meet their national 2020 targets through the use of flexibilities by carrying over, during the period 2013–2020, the part of their annual emission allocation exceeding their annual GHG emissions to subsequent years until the year 2020.

Looking beyond 2020, partial information from Member States indicates that existing and currently planned measures are likely to be insufficient to bring the EU on the pathway to achieving long-term emission reduction objectives. In particular, achieving a reduction of emissions by 80 % to 95 % by 2050 compared to 1990, as agreed by European Heads of State and governments, will require enhanced efforts from Member States. As an example, aggregated projections for 2030 indicate an approximate emission reduction of 30 % compared to 1990, while cost-effective emission reductions consistent with the long-term target should be in the magnitude of 40 %.

6.1 EU projected progress towards its 2020 target and beyond

In March 2007, the European Council committed the EU to reduce its GHG emissions by at least 20 % by 2020 compared to 1990 levels and to increase this commitment to a 30 % reduction if major emitting countries outside of Europe make similarly challenging commitments under a global climate agreement. This commitment covers all emissions covered by the Kyoto Protocol, as well as emissions from international aviation.

Based on the latest emission data from May 2011, EU emissions (Kyoto Protocol scope) stood in 2009 at approximately 17.4 %. When international aviation emissions are also included in the total, EU emission levels were 16.1 % below emission levels. These levels were about 7 % lower than in 2008 and substantial emission reductions were observed in 2008 and 2009 in all Member States due to the effects of the economic crisis and to a strong development of renewable energy.

According to recent estimates from the EEA, 2010 GHG emissions in the EU increased by 2.4 % compared to 2009 and were approximately 15.5 % below 1990 levels. This increase was mostly due to the recovery from economic recession. Furthermore, the winter in 2010 was colder than in the previous

year, in particular in Northern, Central and Eastern European countries, leading to a higher heating demand and higher emissions from the residential and commercial sectors.

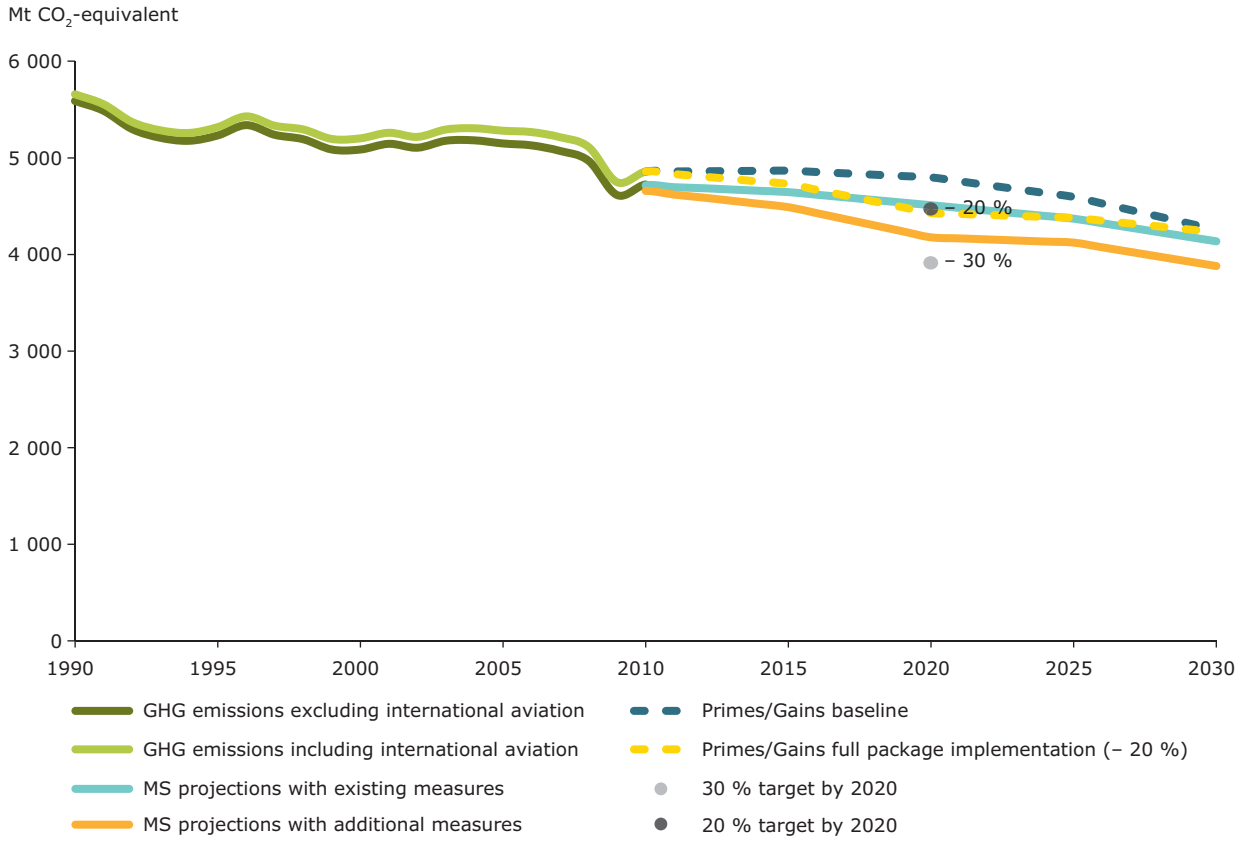
According to Member States' projections, with the existing policy measures, EU GHG emissions (excluding international aviation) will decrease moderately from 2010 onwards, reaching again the levels observed in 2009 by 2016 and achieving a total reduction of about 19 % below 1990 levels by 2020 at 4 510 Mt CO_2-equivalent (see Figure 6.1). Assuming that emissions from international aviation will not follow a stronger reduction, this means that in 2020 a gap of at approximately 1 % is expected to remain if additional measures or financing of emission reduction initiatives outside the EU do not occur.

When the impacts of additional policies and measures (currently at planning stage) are taken into account, emission projections show that the GHG emissions could be about 25 % lower than 1990 levels by 2020. Consequently, the EU has the possibility to overachieve its unilateral 20 % reduction target by up to 5 percentage points if Member States enhance their current efforts. As obtaining full environmental benefit of GHG mitigation policies may take time, these results show that it is urgent for Member States to adopt and implement all those policies currently at the planning stage, such as renewable support policies and energy efficiency measures.

According to the information available from Member States, additional savings would result from the implementation by 2020 of policies related to renewable energy sources, geological storage of CO_2, reductions of CO_2 emissions from cars and modal shift in the transport sector.

Compared to the scenarios produced in 2010 by the European Commission provided for total GHG emissions including international aviation, based on the Primes and Gains models and

Figure 6.1 Trends and projections of EU total GHG emissions



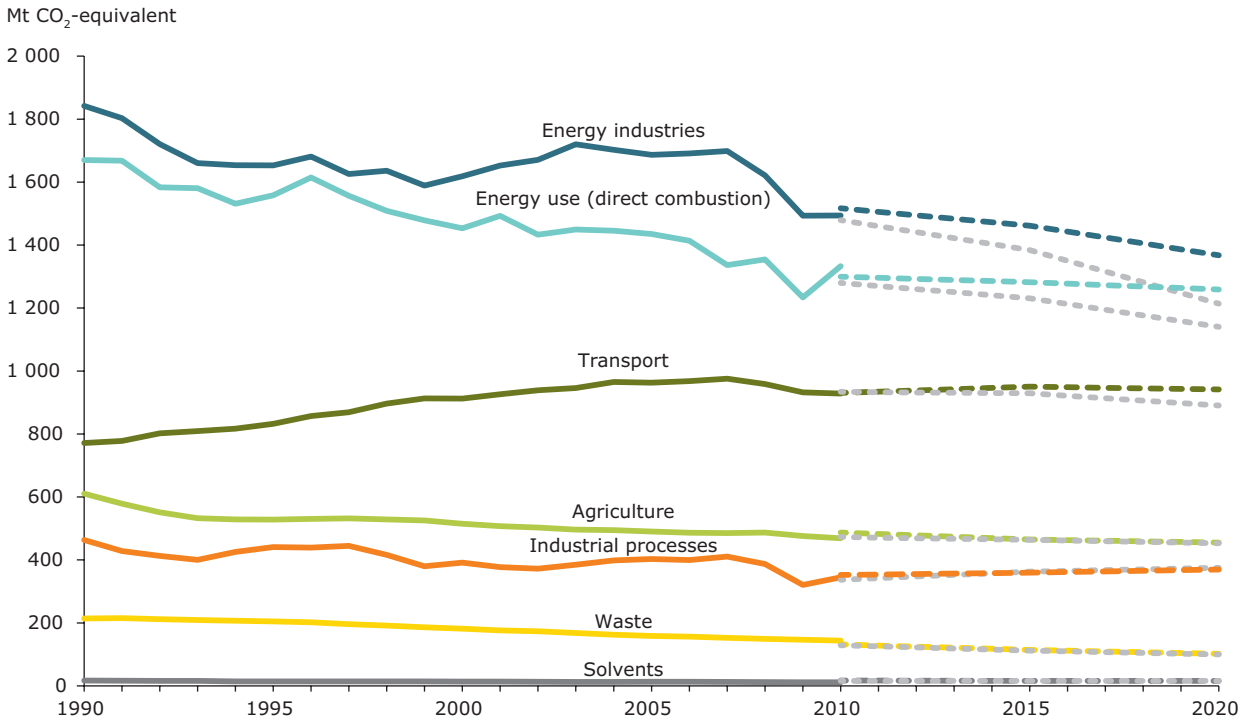
Note: Primes/Gains projections recalibrated by EEA, based on approximated 2010 GHG emissions. MS projections do not include international aviation, while the Primes/Gains scenarios do include it. 2025 and 2030 projections based on information provided by 12 Member States. For other Member States, 2030 projections were gap filled using the 2020–2025 and 2020–2030 relative trends available from the Commission's scenarios based on the Primes and Gains models.

Source: EEA, 2011a; EEA, 2011b; EEA, 2011e; European Commission, 2010a.

recalibrated by EEA based on approximated 2010 GHG emissions, the shapes of projection trajectories appear relatively similar. Parallels can be established between Member States' projections 'with existing measures' and the Commission's baseline scenario (current measures) and, to a lesser extent ([32]), between Member States' projections 'with additional measures' and the Commission's reference scenario, which encompasses the measures included in the climate and energy package adopted in 2009 to enable the EU to achieve its unilateral 20 % emission reduction objective. The impact of international aviation emissions is reflected in the Commission's projections, which indicate reductions ranging — after recalibration by EEA — from 15 % (baseline) to 22 % (reference) ([33]), whereas Member States' projected reductions, which do not include international aviation emissions, range from 19 % to 25 %. The difference may also indicate that significant Member State measures have been implemented or planned between mid-2009 (the cut-off date of the Commission projections) and end of 2010 when most Member States' projections were made.

Looking beyond 2020, projections available from half of the Member States indicate that their GHG emissions could decrease further until 2030 ([34]). Yet, the rate of the decrease seems too slow to allow the EU to achieve the drastic cuts in emissions needed in the long term: projections show that with existing measures, 2030 emissions will be only 26 % below 1990 levels while additional measures will bring 2030 emissions 31 % below 1990 levels. With the additional measures currently planned, the EU would remain far from a pathway enabling it to achieve the long-term objective of reducing emissions by 80 % to 95 % by 2050, as agreed by European Heads of State and governments. According to the 'Roadmap for moving to a competitive low-carbon economy in 2050', published in March 2011 by the European Commission, cost-effective emission reductions consistent with the long-term target could result in domestic emission reductions of about 40 % by 2030 ([35]).

Figure 6.2 Sectoral trends and projections of EU GHG emissions



Source: EEA, 2011a; EEA, 2011b; EEA, 2011e.

([32]) Member State projections are by definition not able to take into account interaction between national and EU measures such as decreasing ETS carbon prices due to lower energy demand and a higher share of renewable energy.
([33]) Without recalibration, original projections for 2020 range from 14 % (baseline) to 20 % (reference).
([34]) Based on projections for 2025 and 2030 reported by 13 Member States. For the other Member States, 2030 projections were gap filled using the 2020–2025 and 2020–2030 relative trends available from the Commission's scenarios based on the Primes and Gains models.
([35]) COM(2011)112; the scope of emissions covered includes international aviation.

6.2 Sectoral projections until 2020

Projections provided by sector indicate that with the existing measures currently in place, emissions will decrease between 2010 and 2020 in the main emitting sectors, except for the transport sector and emissions from industrial processes.

The largest reductions are expected to occur in the energy supply sector (energy industries), consisting mostly of public electricity and heat production (reductions of a magnitude of 150 Mt CO_2-equivalent). These absolute reductions are expected to be 3 to 5 times larger than the reductions expected in the energy use sector (about 40 Mt CO_2-equivalent), the agriculture sector and the waste sector (about 30 Mt CO_2-equivalent each).

Additional measures will mostly target the energy supply and use sectors (magnitude of 100 Mt CO_2-equivalent for each sector), as well as the transport sector (around 50 Mt CO_2-equivalent). In the latter sector (excluding emissions from international aviation and maritime transport), the implementation of additional measures could result in a stabilisation of its emissions by 2015 and net reductions by 2020 but emission levels would still remain between 15 % and 22 % higher than in 1990 by 2020, depending on the scenario considered. Emissions from the agriculture sector could be reduced through additional measures to an extent comparable to the transport sector, although absolute reductions would remain limited (magnitude of 10 Mt CO_2-equivalent). No further emission reduction is expected to occur due to additional measures in the waste sector.

6.3 Projected progress towards national 2020 targets in the non-ETS sectors

The climate and energy package was adopted in April 2009. This package of legislation aims at enabling the EU to achieve a 20 % reduction target in GHG emissions and the 20 % target for renewable energy use. Under this package, the 20 % reduction target for total GHG emissions, which is equivalent to a 14 % reduction in GHG emissions between 2005 and 2020, was split into two sub-targets: a 21 % reduction target compared to 2005 for the emissions covered by the EU ETS (including domestic and international aviation) and a 10 % reduction target compared to 2005 for the remaining non-ETS emissions. While the EU ETS target is to be achieved under the EU-wide ETS, irrespective of the country where the reduction takes place, the non-ETS target was split into national targets to be achieved individually by each Member State. These national targets were expressed as relative 2005–2020 change of non-ETS emissions in Decision 406/2009/EC of 23 April 2009 on the effort of Member States to reduce their GHG emissions to meet the Community's GHG emission reduction commitments up to 2020 (the Effort Sharing Decision).

While absolute emission targets under the Effort Sharing Decision will only be officially determined at the end of 2012, based in particular on 2012 inventory submissions, a first assessment of Member States' progress towards their 2020 targets can be carried out now based on:

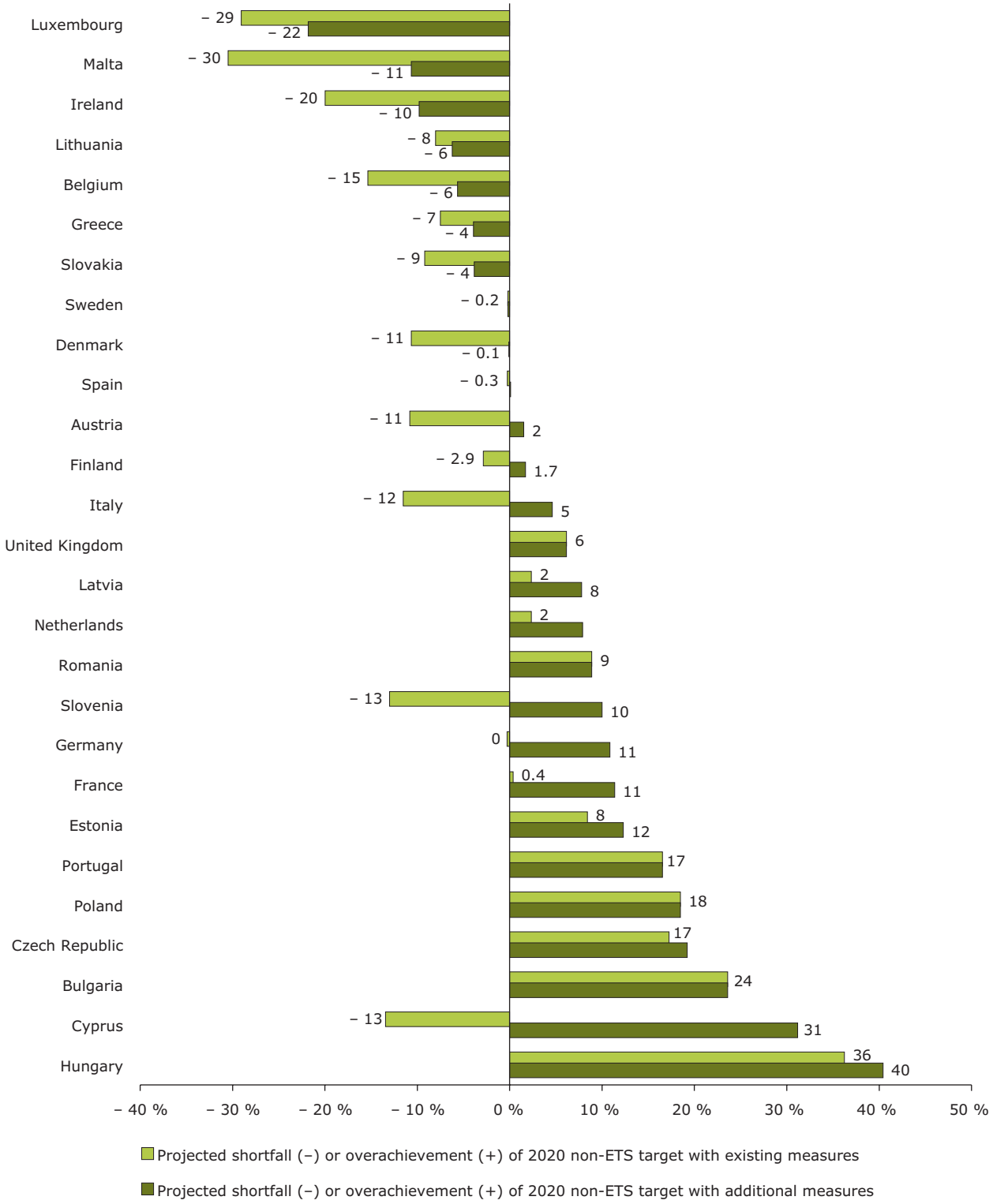
- projections of non-ETS emissions for 2020 consistent with the 2013–2020 ETS scope, either directly reported by Member States ([36]) or gap filled by the EEA on the basis of total GHG emission projections reported by Member States and the percentage contribution of the non-ETS sectors in total emissions taken from the European Commission's baseline scenario projections (based on the Primes/Gains models);
- preliminary estimates of absolute 2020 targets consistent with the 2013–2020 ETS scope, based on 2011 inventory and ETS information and ETS scope correction figures currently under discussion between the European Commission and Member States, using the calculation method which will be used in 2012 to determine these absolute target s.

On that basis, a relative gap between projections of non-ETS emissions and estimated target was calculated for each Member State, taking into consideration the possible implementation of additional measures (see Figure 6.3).

Projections indicate that 2020 domestic GHG emissions in the sectors not covered by the EU ETS could be lower than the respective targets in 11 Member States (Bulgaria, the Czech Republic, Estonia, France, Latvia, Hungary, the Netherlands, Poland, Portugal, Romania and the United Kingdom). The implementation of currently planned (additional) measures in seven Member States (Germany, Spain, Italy, Cyprus, Austria, Slovenia and Finland) could reduce 2020 emissions below target levels. A remaining nine Member States (Belgium, Denmark, Ireland, Greece, Lithuania, Luxembourg, Malta, Slovakia and Sweden) would according to

([36]) Although this is not a requirement under the EU Monitoring Mechanism Decision, 16 Member States followed this recommendation by the European Commission in 2011.

Figure 6.3 Projected gaps between 2020 GHG emissions and national targets in the sectors not covered by the EU ETS



Note: Based on preliminary estimates and calculations by EEA. Data may change in 2012 pending on the publication of 2012 GHG emission inventories and on further comments from Member States concerning ETS scope corrections. Progress calculated based on domestic emissions only, without accounting for possible use of flexibilities. Relative gaps estimated by dividing the difference between projected non-ETS 2020 emissions and estimates of 2020 targets under the Effort Sharing Decision by EEA estimates of 2005 non-ETS emissions (for a scope consistent with the 2013–2020 period, i.e. taking into account the changes in scope of the EU ETS, in particular installations opted out in 2005 and included in the ETS in 2008–2012, and the extension of the ETS scope from 2013 onwards).

Source: EEA, 2011a; European Commission, 2011.

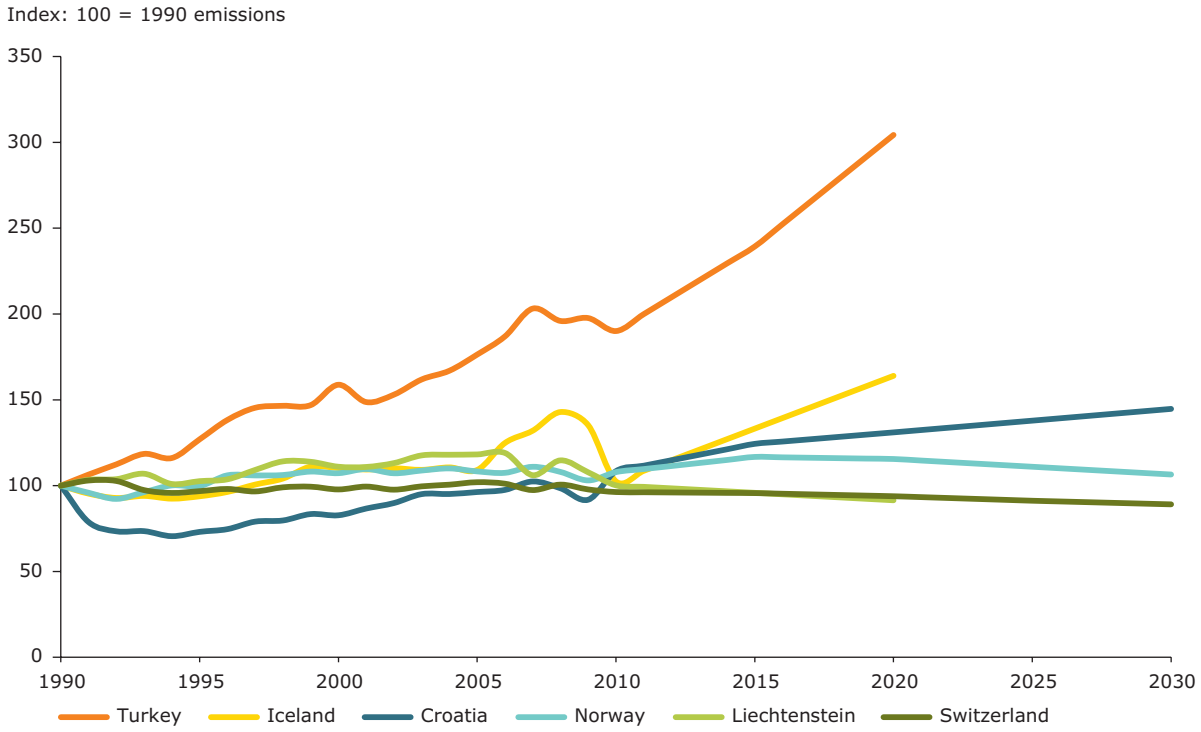
national projections ([37]) not achieve their target through domestic emission reductions, despite the implementation of currently planned measures, and would therefore need to make use of flexibilities to achieve their targets. Indeed, such comparisons concern only the year 2020 and do not take into account the fact that during the 2013–2020 period Member States can carry over the part of their annual emission allocation that exceeds their annual GHG emissions to subsequent years until 2020, which may contribute towards the achievement of their 2020 target. This means that Member States could actually meet their 2020 target even if their non-ETS emissions in 2020 are higher than their national target.

6.4 Projected emissions of other EEA member countries

From the remaining EEA member countries which are not included in the EU-27, Norway and Switzerland provided updated information on emissions projections in 2011. Croatia, Iceland, Liechtenstein and Turkey's projections data are based on the latest emission projections available. All projections have been adjusted to bring the data in line with the latest emissions inventory.

The projected emission trajectories show very diverse situations and expectations for these countries. Projections from Iceland and Turkey indicate a very strong expected growth in emissions. In the case of Iceland, however, emissions are expected to reach the pre-crisis 2008 levels only between 2015 and 2020, as this country was very severely affected by the recession. Croatia also projects a sustained growth in emissions, while for Switzerland emissions are expected to decrease until 2030. Norway is expecting emissions to start decreasing from 2015 onwards and Liechtenstein is expecting emissions to decrease in the short term.

Figure 6.4 Historic GHG trends and emission projections in EEA member countries which are not EU Member States, and Croatia, 1990–2030



Source: 2011 information on GHG projections available from Norway and Switzerland, 2010 information available from Croatia, Liechtenstein and Iceland, and 2007 information available from Turkey.

Source: EEA, 2011a; EEA, 2011e; Croatia, 2010; Liechtenstein, 2010.

([37]) For three of these countries, Greece, Lithuania and Malta, European projections indicate a significantly lower gap to target. See COM(2010)569.

7 Glossary of terms and abbreviations

AAU	Assigned amount unit. A Kyoto unit representing an allowance to emit one metric tonne of carbon dioxide equivalent (CO_2-equivalent) AAUs are created (issued) up to a level of a Party's initial assigned amount.
Annex I	The annex to the UNFCCC specifying which developed country Parties and other Parties to the UNFCCC have committed themselves to limiting anthropogenic emissions and enhancing their GHG sinks and reservoirs
Assigned amount	The total quantity of valid emission allowances (Kyoto units) held by a Party within its national registry. The initial assigned amount for a Party is determined by its base-year emissions, and its emission limitation and reduction objective contained in Annex B to the KP. Any Kyoto units that the Party acquires through the Kyoto mechanisms, or issues for removals from LULUCF activities under Article 3, paragraphs 3 and 4, are added to the Party's assigned amount; any units that the Party transfers, or cancels for emissions from LULUCF activities under Article 3, paragraphs 3 and 4, are subtracted from the Party's assigned amount. At the end of the commitment period, each Party must ensure that its total emissions over the commitment period are less than or equal to its total assigned amount.
Cancellation	The transfer of a unit to a cancellation account. Such units may not be further transferred, and may not be used towards meeting a Party's Kyoto target.
Carry-over	The authorisation for a unit that was issued in one commitment period to be used in a subsequent commitment period. Individual unit types are subject to different rules for carry-over.
CDM	Clean development mechanism. A KP mechanism that allows Annex I Parties to purchase emission allowances from projects in non-Annex I Parties that reduce or remove emissions. The emission allowances from CDM projects are called certified emission reductions (CERs).
CER	Certified emission reduction. A Kyoto unit representing an allowance to emit one metric tonne of CO_2-equivalent. CERs are issued for emission reductions from CDM project activities.
CITL	Community independent transaction log
CO_2	Carbon dioxide
CO_2-eq.	Carbon dioxide-equivalent
Commitment period	The timeframe in which the KP's emission limitation and reduction commitments apply. The first commitment period is 2008–2012.
COP	Conference of the Parties to the United Nations Framework Convention on Climate Change

Domestic	Pertaining to a country's or group of countries' own emissions or internal action to reduce emissions
EC	European Community
EEA	European Environment Agency
ETC/ACC	European Topic Centre on Air and Climate Change. The ETC/ACC is a consortium of European institutes contracted by the EEA to carry out specific tasks in the field of air pollution and climate change.
ERU	Emission reduction unit. A Kyoto unit representing an allowance to emit one metric tonne of CO_2 eq. CERs are issued for emission reductions or emission removals from JI project activities by converting an equivalent quantity of the Party's existing AAUs or RMUs.
EU-12	Bulgaria, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia
EU-15	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom
EU ETS	European Union Emission Trading Scheme
EUA	European Union allowance
GHG	Greenhouse gas
International emissions trading	One of the three KP emissions trading mechanisms, by which an Annex I Party may transfer Kyoto units to or acquire units from another Annex I Party. A Party must meet specific eligibility requirements to participate in emissions trading.
ITL	International transaction log. An electronic data system, administered by the UNFCCC secretariat, which monitors and tracks Parties' transactions of Kyoto units.
JI	Joint implementation. A KP mechanism that allows Annex I Parties to purchase emission allowances from projects of other Annex I Parties that reduce or remove emissions. The emission allowances from JI projects are called emission reduction units (ERUs).
JRC	Joint Research Centre
KP	Kyoto Protocol
LULUCF	Land use, land-use change and forestry. A GHG inventory sector subject to specific accounting rules.
Mt	Mega (million) tonnes
MS	Member State
NAP	National allocation plan
National registry	An electronic database maintained by a Party, or group of Parties, for the transfer and tracking of units in accordance with the KP rules.
Non-Annex I Parties	Parties not included in Annex I to the UNFCCC

RMU	Removal unit. A Kyoto unit representing an allowance to emit one metric tonne of CO_2 eq. RMUs are issued for emission removals from LULUCF activities under Article 3, paragraphs 3 and 4.
Retirement	The transfer of a unit to a retirement account to be used towards meeting a Party's Kyoto commitment.
SEF Table	Standard electronic format for reporting KP units
True-up period	A 100-day period after final emissions have been reported for the commitment period during which Parties have the opportunity to undertake final transactions necessary to achieve compliance with their Kyoto commitment.
UNFCCC	United Nations Framework Convention on Climate Change

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9 Calculation of progress towards Kyoto and 2020 targets

9.1 Calculation of current progress towards Kyoto targets

Country	Line	Category	Operation	2008	2009	2010	Average 2008–2010
EU-15	1	Total GHG emissions		3,998.0	3,723.7	3,811.2	3,844.3
	2	Verified emissions under the EU ETS		1,621.9	1,436.2	1,478.3	1,512.1
	3	Non-ETS GHG emissions	(1) – (2)	2,376.1	2,287.6	2,332.9	2,332.2
	4	Initital assigned amount		3,924.3	3,924.3	3,924.3	3,924.3
	5	Allowances issued under the EU ETS		1,516.7	1,540.2	1,566.7	1,541.2
	6	Non-ETS target	(4) – (5)	2,407.5	2,384.1	2,357.6	2,383.1
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**31.5**	**96.5**	**24.7**	**50.9**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		40.2	40.2	40.2	40.2
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		108.4	108.4	108.4	108.4
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.6	2.9	1.2
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**180.1**	**244.6**	**170.5**	**198.4**
Austria	1	Total GHG emissions		87.0	80.1	84.4	83.8
	2	Verified emissions under the EU ETS		32.0	27.3	31.0	30.1
	3	Non-ETS GHG emissions	(1) – (2)	55.0	52.8	53.4	53.7
	4	Initital assigned amount		68.8	68.8	68.8	68.8
	5	Allowances issued under the EU ETS		30.2	32.3	33.0	31.8
	6	Non-ETS target	(4) – (5)	38.6	36.5	35.8	37.0
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**– 16.3**	**– 16.3**	**– 17.7**	**– 16.8**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		0.7	0.7	0.7	0.7
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		9.0	9.0	9.0	9.0
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.0	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**– 6.6**	**– 6.6**	**– 8.0**	**– 7.1**
Belgium	1	Total GHG emissions		135.2	124.4	132.2	130.6
	2	Verified emissions under the EU ETS		55.5	46.2	50.1	50.6
	3	Non-ETS GHG emissions	(1) – (2)	79.7	78.2	82.1	80.0
	4	Initital assigned amount		134.8	134.8	134.8	134.8
	5	Allowances issued under the EU ETS		55.4	56.8	56.0	56.1
	6	Non-ETS target	(4) – (5)	79.4	78.0	78.8	78.7

Country	Line	Category	Operation	2008	2009	2010	Average 2008–2010
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**– 0.3**	**– 0.2**	**– 3.2**	**– 1.2**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		0.0	0.0	0.0	0.0
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		6.3	6.3	6.3	6.3
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.0	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**6.0**	**6.0**	**3.0**	**5.0**
Bulgaria	1	Total GHG emissions		69.0	59.5	59.1	62.5
	2	Verified emissions under the EU ETS		38.3	32.0	33.5	34.6
	3	Non-ETS GHG emissions	(1) – (2)	30.7	27.5	25.6	27.9
	4	Initital assigned amount		122.0	122.0	122.0	122.0
	5	Allowances issued under the EU ETS		38.3	40.6	35.2	38.0
	6	Non-ETS target	(4) – (5)	83.7	81.4	86.8	84.0
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**53.0**	**53.9**	**61.3**	**56.1**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		0.0	0.0	0.0	0.0
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		– 1.4	– 1.4	– 1.4	– 1.4
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	3.3	1.1
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**51.6**	**52.5**	**56.5**	**53.5**
Croatia	1	Total GHG emissions		31.0	28.9	n.a.	29.9
	2	Verified emissions under the EU ETS		n.a.	n.a.	n.a.	n.a.
	3	Total GHG emissions	(1) – (2)	31.0	28.9	n.a.	29.9
	4	Initital assigned amount		29.8	29.8	n.a.	29.8
	5	Allowances issued under the EU ETS		n.a.	n.a.	n.a.	n.a.
	6	Non-ETS target	(4) – (5)	29.8	29.8	n.a.	29.8
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**– 1.2**	**0.9**	**n.a.**	**– 0.2**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		1.0	1.0	n.a.	1.0
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		0.0	0.0	n.a.	0.0
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	n.a.	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**– 0.2**	**1.9**	**n.a.**	**0.8**
Czech Republic	1	Total GHG emissions		141.1	132.9	135.6	136.6
	2	Verified emissions under the EU ETS		80.4	73.8	75.6	76.6
	3	Non-ETS GHG emissions	(1) – (2)	60.7	59.1	60.0	60.0
	4	Initital assigned amount		178.7	178.7	178.7	178.7
	5	Allowances issued under the EU ETS		85.6	86.0	86.1	85.9
	6	Non-ETS target	(4) – (5)	93.1	92.7	92.6	92.8

Country	Line	Category	Operation	2008	2009	2010	Average 2008–2010
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**32.4**	**33.6**	**32.6**	**32.9**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		1.2	1.2	1.2	1.2
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		– 25.0	– 25.0	– 25.0	– 25.0
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.3	1.4	0.6
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**8.6**	**9.4**	**7.4**	**8.5**
Denmark	1	Total GHG emissions		63.7	61.0	61.4	62.0
	2	Verified emissions under the EU ETS		26.5	25.5	25.3	25.8
	3	Non-ETS GHG emissions	(1) – (2)	37.1	35.5	36.1	36.3
	4	Initital assigned amount		55.8	55.8	55.8	55.8
	5	Allowances issued under the EU ETS		24.0	23.9	23.9	23.9
	6	Non-ETS target	(4) – (5)	31.8	31.9	31.9	31.8
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**– 5.3**	**– 3.7**	**– 4.3**	**– 4.4**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		1.6	1.6	1.6	1.6
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		3.7	3.7	3.7	3.7
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.0	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**0.0**	**1.7**	**1.1**	**0.9**
Estonia	1	Total GHG emissions		20.1	16.8	20.2	19.0
	2	Verified emissions under the EU ETS		13.5	10.3	14.4	12.8
	3	Non-ETS GHG emissions	(1) – (2)	6.5	6.5	5.8	6.3
	4	Initital assigned amount		39.2	39.2	39.2	39.2
	5	Allowances issued under the EU ETS		11.7	11.9	11.9	11.8
	6	Non-ETS target	(4) – (5)	27.5	27.4	27.4	27.4
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**21.0**	**20.8**	**21.6**	**21.1**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		0.0	0.0	0.0	0.0
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		– 1.2	– 1.2	– 1.2	– 1.2
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.2	0.1
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**19.8**	**19.6**	**20.2**	**19.9**
Finland	1	Total GHG emissions		70.4	66.3	74.4	70.4
	2	Verified emissions under the EU ETS		36.2	34.3	41.3	37.3
	3	Non-ETS GHG emissions	(1) – (2)	34.3	32.0	33.1	33.1
	4	Initital assigned amount		71.0	71.0	71.0	71.0
	5	Allowances issued under the EU ETS		36.5	37.1	37.9	37.2
	6	Non-ETS target	(4) – (5)	34.5	33.9	33.1	33.8
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**0.2**	**1.9**	**– 0.1**	**0.7**

Country	Line	Category	Operation	2008	2009	2010	Average 2008–2010
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		0.6	0.6	0.6	0.6
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		1.0	1.0	1.0	1.0
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.1	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**1.8**	**3.5**	**1.4**	**2.2**
France	1	Total GHG emissions		539.2	517.2	524.6	527.0
	2	Verified emissions under the EU ETS		124.1	111.1	114.7	116.6
	3	Non-ETS GHG emissions	(1) – (2)	415.1	406.2	409.9	410.4
	4	Initital assigned amount		563.9	563.9	563.9	563.9
	5	Allowances issued under the EU ETS		134.3	133.4	130.1	132.6
	6	Non-ETS target	(4) – (5)	429.7	430.6	433.8	431.3
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**14.5**	**24.4**	**23.9**	**20.9**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		3.2	3.2	3.2	3.2
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		0.0	0.0	0.0	0.0
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.4	1.5	0.6
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**17.8**	**27.2**	**25.6**	**23.5**
Germany	1	Total GHG emissions		981.1	919.7	960.1	953.6
	2	Verified emissions under the EU ETS		472.7	428.2	454.7	451.9
	3	Non-ETS GHG emissions	(1) – (2)	508.5	491.5	505.4	501.8
	4	Initital assigned amount		973.6	973.6	973.6	973.6
	5	Allowances issued under the EU ETS		437.9	432.8	441.7	437.5
	6	Non-ETS target	(4) – (5)	535.7	540.8	531.9	536.2
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**27.3**	**49.3**	**26.6**	**34.4**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		4.5	4.5	4.5	4.5
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		0.0	0.0	0.0	0.0
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.1	1.3	0.5
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**31.8**	**53.7**	**29.8**	**38.4**
Greece	1	Total GHG emissions		128.6	122.5	120.3	123.8
	2	Verified emissions under the EU ETS		69.9	63.7	59.9	64.5
	3	Non-ETS GHG emissions	(1) – (2)	58.7	58.9	60.4	59.3
	4	Initital assigned amount		133.7	133.7	133.7	133.7
	5	Allowances issued under the EU ETS		63.7	63.2	64.6	63.9
	6	Non-ETS target	(4) – (5)	70.0	70.5	69.1	69.9
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**11.4**	**11.6**	**8.7**	**10.6**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		0.6	0.6	0.6	0.6

Country	Line	Category	Operation	2008	2009	2010	Average 2008–2010
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		0.0	0.0	0.0	0.0
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.0	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**12.0**	**12.2**	**9.3**	**11.2**
Hungary	1	Total GHG emissions		73.1	66.7	67.7	69.2
	2	Verified emissions under the EU ETS		27.2	22.4	23.0	24.2
	3	Non-ETS GHG emissions	(1) – (2)	45.9	44.3	44.7	45.0
	4	Initital assigned amount		108.5	108.5	108.5	108.5
	5	Allowances issued under the EU ETS		25.1	23.9	25.7	24.9
	6	Non-ETS target	(4) – (5)	83.4	84.6	82.8	83.6
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**37.5**	**40.2**	**38.1**	**38.6**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		1.1	1.1	1.1	1.1
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		– 4.0	– 4.0	– 4.0	– 4.0
	10	Emission reduction units (ERUs) issued under JI projects		0.0	1.2	1.4	0.8
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**34.6**	**36.1**	**33.8**	**34.8**
Iceland	1	Total GHG emissions		3.7	3.4	n.a.	3.6
	2	Verified emissions under the EU ETS		n.a.	n.a.	n.a.	n.a.
	3	Total GHG emissions	(1) – (2)	3.7	3.4	n.a.	3.6
	4	Initital assigned amount		3.7	3.7	n.a.	3.7
	5	Allowances issued under the EU ETS		n.a.	n.a.	n.a.	n.a.
	6	Non-ETS target	(4) – (5)	3.7	3.7	n.a.	3.7
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**0.0**	**0.3**	**n.a.**	**0.1**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		0.7	0.7	n.a.	0.7
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		0.0	0.0	n.a.	0.0
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	n.a.	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**0.6**	**0.9**	**n.a.**	**0.8**
Ireland	1	Total GHG emissions		67.8	62.4	60.6	63.6
	2	Verified emissions under the EU ETS		20.4	17.2	17.4	18.3
	3	Non-ETS GHG emissions	(1) – (2)	47.4	45.2	43.2	45.3
	4	Initital assigned amount		62.8	62.8	62.8	62.8
	5	Allowances issued under the EU ETS		20.0	20.1	21.2	20.4
	6	Non-ETS target	(4) – (5)	42.9	42.7	41.6	42.4
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**– 4.6**	**– 2.5**	**– 1.6**	**– 2.9**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		2.8	2.8	2.8	2.8

Country	Line	Category	Operation	2008	2009	2010	Average 2008–2010
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		1.7	1.7	1.7	1.7
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.0	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**– 0.1**	**2.0**	**2.8**	**1.6**
Italy	1	Total GHG emissions		541.7	491.1	493.6	508.8
	2	Verified emissions under the EU ETS		220.7	184.9	191.5	199.0
	3	Non-ETS GHG emissions	(1) – (2)	321.1	306.2	302.1	309.8
	4	Initital assigned amount		483.3	483.3	483.3	483.3
	5	Allowances issued under the EU ETS		212.2	209.0	200.1	207.1
	6	Non-ETS target	(4) – (5)	271.1	274.3	283.1	276.2
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**– 50.0**	**– 32.0**	**– 19.0**	**– 33.6**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		10.2	10.2	10.2	10.2
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		14.8	14.8	14.8	14.8
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.0	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**– 25.0**	**– 7.0**	**6.0**	**– 8.6**
Latvia	1	Total GHG emissions		11.9	10.7	11.5	11.4
	2	Verified emissions under the EU ETS		2.7	2.5	3.2	2.8
	3	Non-ETS GHG emissions	(1) – (2)	9.2	8.2	8.2	8.6
	4	Initital assigned amount		23.8	23.8	23.8	23.8
	5	Allowances issued under the EU ETS		2.9	3.5	3.5	3.3
	6	Non-ETS target	(4) – (5)	20.9	20.3	20.3	20.5
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**11.7**	**12.1**	**12.1**	**12.0**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		1.3	1.3	1.3	1.3
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		– 8.4	– 8.4	– 8.4	– 8.4
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.0	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**4.6**	**4.9**	**4.9**	**4.8**
Liechten-stein	1	Total GHG emissions		0.3	0.2	n.a.	0.3
	2	Verified emissions under the EU ETS		0.0	0.0	n.a.	0.0
	3	Non-ETS GHG emissions	(1) – (2)	0.2	0.2	n.a.	0.2
	4	Initital assigned amount		0.2	0.2	n.a.	0.2
	5	Allowances issued under the EU ETS		0.0	0.0	n.a.	0.0
	6	Non-ETS target	(4) – (5)	0.2	0.2	n.a.	0.2
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**– 0.1**	**0.0**	**n.a.**	**0.0**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		0.0	0.0	n.a.	0.0

Country	Line	Category	Operation	2008	2009	2010	Average 2008–2010
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		0.0	0.0	n.a.	0.0
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	n.a.	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**0.0**	**0.0**	**n.a.**	**0.0**
Lithuania	1	Total GHG emissions		24.0	21.6	22.3	22.7
	2	Verified emissions under the EU ETS		6.1	5.8	6.4	6.1
	3	Non-ETS GHG emissions	(1) – (2)	17.9	15.8	15.9	16.6
	4	Initital assigned amount		45.5	45.5	45.5	45.5
	5	Allowances issued under the EU ETS		7.5	7.6	8.2	7.7
	6	Non-ETS target	(4) – (5)	38.0	37.9	37.3	37.7
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**20.0**	**22.1**	**21.4**	**21.1**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		0.0	0.0	0.0	0.0
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		– 2.1	– 2.1	– 2.1	– 2.1
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.0	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**17.9**	**20.0**	**19.3**	**19.0**
Luxem-bourg	1	Total GHG emissions		12.3	11.7	12.2	12.1
	2	Verified emissions under the EU ETS		2.1	2.2	2.3	2.2
	3	Non-ETS GHG emissions	(1) – (2)	10.2	9.5	10.0	9.9
	4	Initital assigned amount		9.5	9.5	9.5	9.5
	5	Allowances issued under the EU ETS		2.5	2.5	2.5	2.5
	6	Non-ETS target	(4) – (5)	7.0	7.0	7.0	7.0
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**– 3.2**	**– 2.5**	**– 3.0**	**– 2.9**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		0.0	0.0	0.0	0.0
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		2.7	2.7	2.7	2.7
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.0	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**– 0.5**	**0.2**	**– 0.3**	**– 0.2**
Netherlands	1	Total GHG emissions		204.6	198.9	210.7	204.7
	2	Verified emissions under the EU ETS		83.5	81.0	84.4	83.0
	3	Non-ETS GHG emissions	(1) – (2)	121.1	117.8	126.2	121.7
	4	Initital assigned amount		200.3	200.3	200.3	200.3
	5	Allowances issued under the EU ETS		76.8	83.8	92.8	84.5
	6	Non-ETS target	(4) – (5)	123.5	116.4	107.4	115.8
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**2.4**	**– 1.4**	**– 18.8**	**– 5.9**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		0.0	0.0	0.0	0.0
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		10.0	10.0	10.0	10.0

Country	Line	Category	Operation	2008	2009	2010	Average 2008–2010
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.0	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**12.4**	**8.6**	**– 8.8**	**4.0**
Norway	1	Total GHG emissions		53.7	51.3	53.7	52.9
	2	Verified emissions under the EU ETS		19.3	19.2	19.3	19.3
	3	Non-ETS GHG emissions	(1) – (2)	34.4	32.1	34.4	33.6
	4	Initital assigned amount		50.1	50.1	50.1	50.1
	5	Allowances issued under the EU ETS		7.5	20.7	14.4	14.2
	6	Non-ETS target	(4) – (5)	42.6	29.5	35.8	35.9
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**8.2**	**– 2.6**	**1.4**	**2.3**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		0.0	0.0	0.0	0.0
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		4.5	4.5	4.5	4.5
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.0	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**12.7**	**1.9**	**5.9**	**6.8**
Poland	1	Total GHG emissions		395.7	376.7	393.3	389.5
	2	Verified emissions under the EU ETS		204.1	191.2	199.7	198.3
	3	Non-ETS GHG emissions	(1) – (2)	191.6	185.5	193.5	190.2
	4	Initital assigned amount		529.6	529.6	529.6	529.6
	5	Allowances issued under the EU ETS		201.0	202.0	205.3	202.8
	6	Non-ETS target	(4) – (5)	328.6	327.6	324.3	326.9
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**137.0**	**142.1**	**130.8**	**136.7**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		3.0	3.0	3.0	3.0
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		0.0	0.0	0.0	0.0
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.1	3.9	1.3
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**140.0**	**145.0**	**129.9**	**138.3**
Portugal	1	Total GHG emissions		77.9	74.6	74.8	75.8
	2	Verified emissions under the EU ETS		29.9	28.3	24.2	27.5
	3	Non-ETS GHG emissions	(1) – (2)	48.0	46.3	50.6	48.3
	4	Initital assigned amount		76.4	76.4	76.4	76.4
	5	Allowances issued under the EU ETS		30.5	31.0	32.7	31.4
	6	Non-ETS target	(4) – (5)	45.9	45.4	43.7	45.0
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**– 2.1**	**– 1.0**	**– 6.9**	**– 3.3**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		4.7	4.7	4.7	4.7
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		1.5	1.5	1.5	1.5
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.0	0.0

Country	Line	Category	Operation	2008	2009	2010	Average 2008–2010
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**4.1**	**5.2**	**– 0.7**	**2.9**
Romania	1	Total GHG emissions		153.4	130.8	129.7	138.0
	2	Verified emissions under the EU ETS		64.1	49.0	47.3	53.5
	3	Non-ETS GHG emissions	(1) – (2)	89.3	81.8	82.3	84.5
	4	Initital assigned amount		256.0	256.0	256.0	256.0
	5	Allowances issued under the EU ETS		71.8	74.0	74.9	73.5
	6	Non-ETS target	(4) – (5)	184.2	182.0	181.1	182.4
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**94.9**	**100.2**	**98.8**	**97.9**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		0.0	0.0	0.0	0.0
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		0.0	0.0	0.0	0.0
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.4	0.1
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**94.9**	**100.2**	**98.4**	**97.8**
Slovakia	1	Total GHG emissions		48.2	43.4	44.0	45.2
	2	Verified emissions under the EU ETS		25.3	21.6	21.7	22.9
	3	Non-ETS GHG emissions	(1) – (2)	22.8	21.8	22.3	22.3
	4	Initital assigned amount		66.3	66.3	66.3	66.3
	5	Allowances issued under the EU ETS		32.2	32.1	32.3	32.2
	6	Non-ETS target	(4) – (5)	34.1	34.1	33.9	34.1
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**11.3**	**12.3**	**11.6**	**11.7**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		0.0	0.0	0.0	0.0
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		– 8.4	– 8.4	– 8.4	– 8.4
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.0	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**2.9**	**3.9**	**3.2**	**3.3**
Slovenia	1	Total GHG emissions		21.3	19.3	19.7	20.1
	2	Verified emissions under the EU ETS		8.9	8.1	8.1	8.4
	3	Non-ETS GHG emissions	(1) – (2)	12.4	11.3	11.6	11.8
	4	Initital assigned amount		18.7	18.7	18.7	18.7
	5	Allowances issued under the EU ETS		8.2	8.2	8.2	8.2
	6	Non-ETS target	(4) – (5)	10.5	10.5	10.5	10.5
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**– 1.9**	**– 0.8**	**– 1.0**	**– 1.2**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		1.3	1.3	1.3	1.3
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		1.0	1.0	1.0	1.0
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.0	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**0.4**	**1.6**	**1.3**	**1.1**

Country	Line	Category	Operation	2008	2009	2010	Average 2008–2010
Spain	1	Total GHG emissions		404.8	367.5	353.9	375.4
	2	Verified emissions under the EU ETS		163.5	136.9	121.5	140.6
	3	Non-ETS GHG emissions	(1) – (2)	241.3	230.6	232.5	234.8
	4	Initital assigned amount		333.2	333.2	333.2	333.2
	5	Allowances issued under the EU ETS		153.9	150.7	150.1	151.6
	6	Non-ETS target	(4) – (5)	179.3	182.5	183.1	181.7
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**– 62.0**	**– 48.1**	**– 49.4**	**– 53.1**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		5.5	5.5	5.5	5.5
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		57.8	57.8	57.8	57.8
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.0	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**1.3**	**15.2**	**13.9**	**10.1**
Sweden	1	Total GHG emissions		63.6	60.0	64.4	62.7
	2	Verified emissions under the EU ETS		20.1	17.5	22.7	20.1
	3	Non-ETS GHG emissions	(1) – (2)	43.5	42.5	41.7	42.6
	4	Initital assigned amount		75.0	75.0	75.0	75.0
	5	Allowances issued under the EU ETS		20.8	21.1	23.5	21.8
	6	Non-ETS target	(4) – (5)	54.3	53.9	51.5	53.2
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**10.8**	**11.4**	**9.8**	**10.6**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		2.1	2.1	2.1	2.1
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		0.0	0.0	0.0	0.0
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.0	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**12.9**	**13.6**	**11.9**	**12.8**
Switzerland	1	Total GHG emissions		53.4	51.9	n.a.	52.7
	2	Verified emissions under the EU ETS		n.a.	n.a.	n.a.	n.a.
	3	Total GHG emissions	(1) – (2)	53.4	51.9	n.a.	52.7
	4	Initital assigned amount		48.6	48.6	n.a.	48.6
	5	Allowances issued under the EU ETS		n.a.	n.a.	n.a.	n.a.
	6	Non-ETS target	(4) – (5)	48.6	48.6	n.a.	48.6
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**– 4.9**	**– 3.4**	**n.a.**	**– 4.1**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		0.5	0.5	n.a.	0.5
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		2.0	2.0	n.a.	2.0
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	n.a.	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**– 2.4**	**– 0.9**	**n.a.**	**– 1.7**

Country	Line	Category	Operation	2008	2009	2010	Average 2008–2010
United Kingdom	1	Total GHG emissions		620.3	566.2	584.5	590.3
	2	Verified emissions under the EU ETS		265.1	232.0	237.4	244.8
	3	Non-ETS GHG emissions	(1) – (2)	355.2	334.3	347.1	345.5
	4	Initital assigned amount		679.3	679.3	679.3	679.3
	5	Allowances issued under the EU ETS		218.3	242.4	256.4	239.1
	6	Non-ETS target	(4) – (5)	461.0	436.9	422.8	440.2
	7	**Difference between target and GHG emissions (non-ETS, domestic)**	**(6) – (3)**	**105.8**	**102.6**	**75.8**	**94.7**
	8	Expected net carbon sequestration from LULUCF activities (RMUs)		3.7	3.7	3.7	3.7
	9	Planned use of Kyoto mechanisms by government (net transfer of AAUs + purchase of CERs + ERUs)		0.0	0.0	0.0	0.0
	10	Emission reduction units (ERUs) issued under JI projects		0.0	0.0	0.0	0.0
	11	**Difference between target and GHG emissions (non-ETS, including plans on Kyoto mechanisms and carbon sinks)**	**(7) + (8) + (9) – (10)**	**109.5**	**106.3**	**79.4**	**98.4**

9.2 Calculation of projected progress towards 2020 targets

Country	2005 non-ETS emissions estimate	2020 ESD target	2020 ESD target estimate	2020 non-ETS projections WEM	2020 non-ETS projections WAM	Gap with existing measures		Gap with additional measures	
	Mt CO_2–eq.	%	Mt CO_2–eq.	Mt CO_2–eq.	Mt CO_2–eq.	Mt CO_2–eq.	% of 2005 non-ETS	Mt CO_2–eq.	% of 2005 non-ETS
Austria	57.0	– 16.0 %	47.9	54.0	47.0	– 6.2	– 10.8 %	0.9	1.5 %
Belgium	78.0	– 15.0 %	66.3	78.3	70.7	– 12.0	– 15.3 %	– 4.4	– 5.6 %
Bulgaria	26.6	20.0 %	31.9	25.7	25.7	6.3	23.6 %	6.3	23.6 %
Cyprus	4.5	– 5.0 %	4.3	4.9	2.9	– 0.6	– 13.4 %	1.4	31.2 %
Czech Republic	59.8	9.0 %	65.2	54.9	53.7	10.3	17.2 %	11.5	19.2 %
Denmark	37.0	– 20.0 %	29.6	33.6	29.6	– 3.9	– 10.7 %	0.0	– 0.1 %
Estonia	6.2	11.0 %	6.9	6.4	6.1	0.5	8.4 %	0.8	12.3 %
Finland	32.8	– 16.0 %	27.6	28.5	27.0	– 0.9	– 2.9 %	0.6	1.7 %
France	412.9	– 14.0 %	355.1	353.6	308.2	1.5	0.4 %	46.9	11.4 %
Germany	487.9	– 14.0 %	419.6	421.0	366.7	– 1.3	– 0.3 %	52.9	10.8 %
Greece	60.0	– 4.0 %	57.6	62.1	60.0	– 4.5	– 7.5 %	– 2.4	– 3.9 %
Hungary	51.6	10.0 %	56.7	38.0	35.9	18.7	36.2 %	20.8	40.4 %
Ireland	46.3	– 20.0 %	37.0	46.3	41.5	– 9.2	– 20.0 %	– 4.5	– 9.8 %
Italy	329.4	– 13.0 %	286.6	324.5	271.4	– 37.9	– 11.5 %	15.2	4.6 %
Latvia	8.5	17.0 %	10.0	9.8	9.3	0.2	2.3 %	0.7	7.8 %
Lithuania	12.7	15.0 %	14.6	15.6	15.4	– 1.0	– 8.0 %	– 0.8	– 6.2 %
Luxembourg	10.2	– 20.0 %	8.2	11.2	10.4	– 3.0	– 29.0 %	– 2.2	– 21.8 %
Malta	1.0	5.0 %	1.0	1.3	1.1	– 0.3	– 30.5 %	– 0.1	– 10.6 %
Netherlands	124.5	– 16.0 %	104.6	101.7	94.8	2.9	2.3 %	9.8	7.9 %
Poland	171.4	14.0 %	195.4	163.7	163.7	31.7	18.5 %	31.7	18.5 %
Portugal	47.9	1.0 %	48.4	40.5	40.5	7.9	16.5 %	7.9	16.5 %
Romania	80.6	19.0 %	95.9	88.8	88.8	7.2	8.9 %	7.2	8.9 %
Slovakia	21.4	13.0 %	24.1	26.1	25.0	– 2.0	– 9.2 %	– 0.8	– 3.8 %
Slovenia	11.4	4.0 %	11.9	13.4	10.7	– 1.5	– 13.0 %	1.1	10.0 %
Spain	231.0	– 10.0 %	207.9	208.5	207.6	– 0.6	– 0.3 %	0.2	0.1 %
Sweden	44.1	– 17.0 %	36.6	36.7	36.7	– 0.1	– 0.2 %	– 0.1	– 0.2 %
United Kingdom	374.3	– 16.0 %	314.4	291.3	291.3	23.0	6.2 %	23.0	6.2 %

Note: Progress calculated based on domestic emissions only, without accounting for possible use of flexibilities.

The ESD target represents the 2020 target for emissions not covered by the EU ETS, as defined in percentage in the Effort Sharing Decision (European Commission, 2009a). The quantitative 2020 targets are preliminary estimates by EEA, based on 2011 GHG inventories, ETS verified emissions available in 2011 and AEA calculation method from the Commission, taking into account cap adjustments. These data are based on preliminary estimates and calculations by EEA and do not constitute final data. In particular they may change in 2012 pending on the publication of 2012 GHG emission inventories and on further comments from Member States concerning ETS scope corrections.

2005 non-ETS emissions estimated based on 2020 target estimates and percentage reduction targets. These estimates do not include CO_2 from domestic aviation.

Absolute gaps calculated as the difference between emissions and targets. Relative gaps estimated by dividing absolute gaps by 2005 non-ETS emission estimates.

Source: EEA, 2011a, EEA, 2011d; European Commission, 2009a, information on possible cap adjustments provided by the European Commission.

10 Country profiles

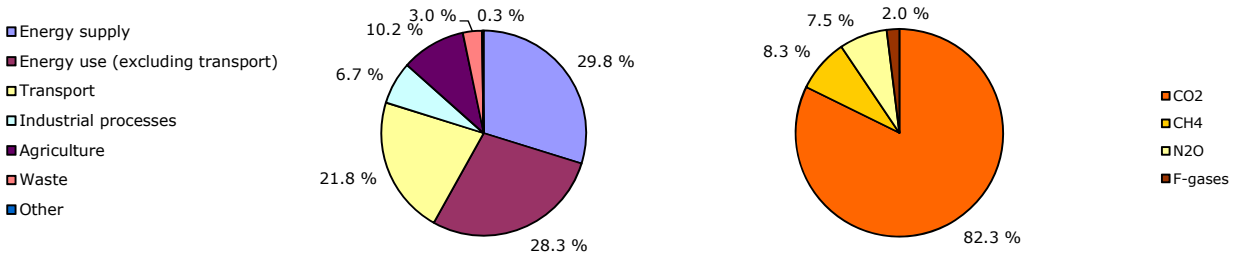
Country profiles have been prepared for each EEA member country. The country profiles present key data on trends in greenhouse gas emissions over the period 1990–2010 (1990–2009 for non-EU Member States) and projections of greenhouse gas emissions until 2020, with additional data on the EU ETS for 2008–2010. All data made available by member countries up to mid May 2011 is included. The country profiles also include brief assessments of past trends (1990–2009, 2008–2009) and progress towards Kyoto targets (where applicable).

GHG trends and projections in the EU-15

European Environment Agency

Key GHG data (1)	1990	2008	2009	2010 (2)	Unit	Rank in EU-27 (3)	Rank in EU-15 (3)
Total greenhouse gas emissions (GHG)	4 264.9	3 998.0	3 723.7	3 811.2	Mt CO_2-eq.	n.a.	n.a.
GHG from international bunkers (4)	170.3	306.1	278.7	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG per capita	11.7	10.1	9.4	9.6	t CO_2-eq. / capita	n.a.	n.a.
GHG per GDP (constant prices) (5)	595	395	384	386	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	76.3 %	80.5 %	80.7 %	80.7 %	%		
EU ETS verified emissions - all installations (6)		1 621.9	1 436.2	1 478.3	Mt CO_2-eq.	n.a.	n.a.
EU ETS verified emissions - constant scope (7)		1 620.5	1 433.5	1 464.1	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		40.6 %	38.6 %	38.8 %	%		
ETS verified emissions compared to annual allowances (8)		7.8 %	– 6.5 %	– 5.6 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 (1) (9)



Key GHG trends	1990–2009		2008–2009		1990–2010 (2)		2009–2010 (2)	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 541.2	– 12.7 %	– 274.3	– 6.9 %	– 453.7	– 10.6 %	87.5	2.3 %
GHG per capita	– 2.3	– 19.6 %	– 0.7	– 7.3 %	– 2.1	– 18.1 %	0.2	1.9 %
EU ETS verified emissions - all installations (6)			– 185.8	– 11.5 %			42.1	2.9 %
EU ETS verified emissions - constant scope (7)			– 187.0	– 11.5 %			– 187.0	– 11.5 %

Assessment of long-term GHG trend (1990–2009)

Leaving aside the 2009 economic recession, a wide range of factors and policies (climatic and non climatic) have contributed to the long-term decline in GHG emissions in the EU, particularly for CO2. These include improvements in the efficiency of transformation of primary energy into heat and electricity, the shift to less carbon-intensive fossil fuels (e.g. coal to gas) and the strong increase in renewable energy use. However, emissions from road transportation, particularly the combustion of diesel in passenger cars and freight transport, have increased very rapidly. CO2emissions from international aviation and shipping, excluded from Kyoto targets, also increased very rapidly during the 20-year period. Consistent with warmer climatic conditions and higher comfort standards, the consumption of HFCs in air conditioning equipment and refrigeration were the only group of greenhouse gases that increased overall since 1990. The direct effects of the Montreal Protocol in reducing emissions of ozone-depleting substances have also indirectly contributed to significant reductions in emissions of some potent greenhouse gases such as CFCs. Other EU policies such as the Nitrates Directive, the Common Agriculture Policy (CAP) and the Landfill Waste Directive have also been successful in indirectly reducing greenhouse gas emissions from non- CO2 gases such as methane and nitrous oxides.

Assessment of short-term GHG trend (2008–2009)

The strength of the 2009 recession affected all economic sectors in the EU. Despite the relatively colder winter of 2009 emissions fell in the residential sector. In relative terms, the largest emission reductions occurred in industrial processes reflecting lower activity levels in the cement, chemical and iron and steel industries. Carbon intensity continued its downward trend in 2009, not so much because of fossil fuel switching but because coal use fell significantly more than oil or gas did. Along with the strong decline of primary consumption of fossil fuels (gas, coal, oil) the energy balances also show a very strong increase in renewable energy, particularly of wind and solar for electricity generation. In absolute terms, biomass still represented over 75 % of the increase in renewables in 2009. Overall, decreased demand for energy linked to the economic recession was accompanied by a strong increase in renewable energy use, which also contributed to lower emissions. Nuclear electricity production fell in 2009. HFCs from industrial processes were the only group of greenhouse gases that increased in 2009, continuing the long trend observed since 1990.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

(2) Based on EEA estimate of 2010 emissions.

(3) Comparison of 2009 values, 1 = highest value among EU countries.

(4) International bunkers: international aviation and international maritime transport.

(5) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

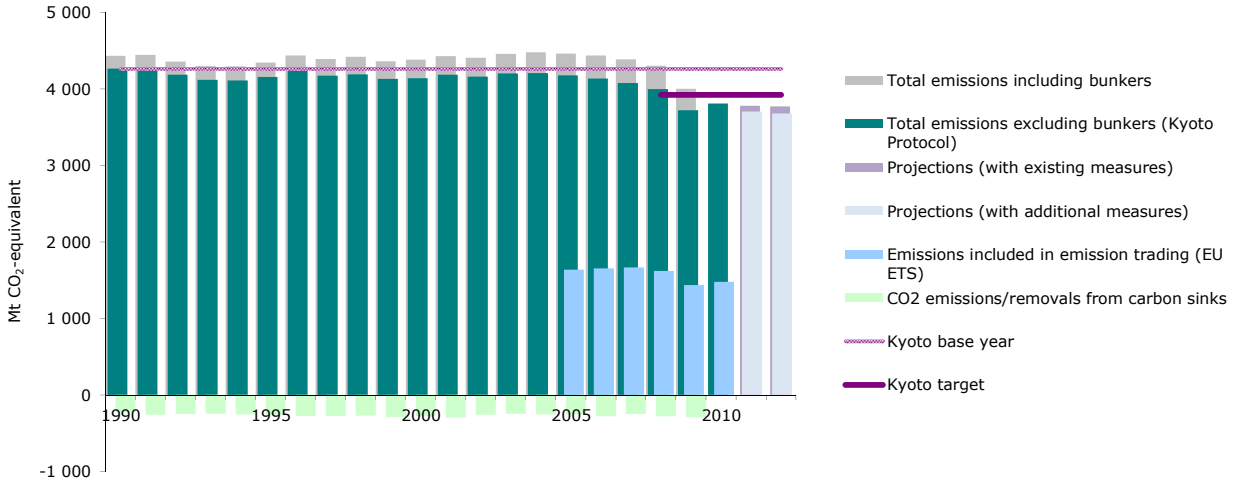
(6) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

(7) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

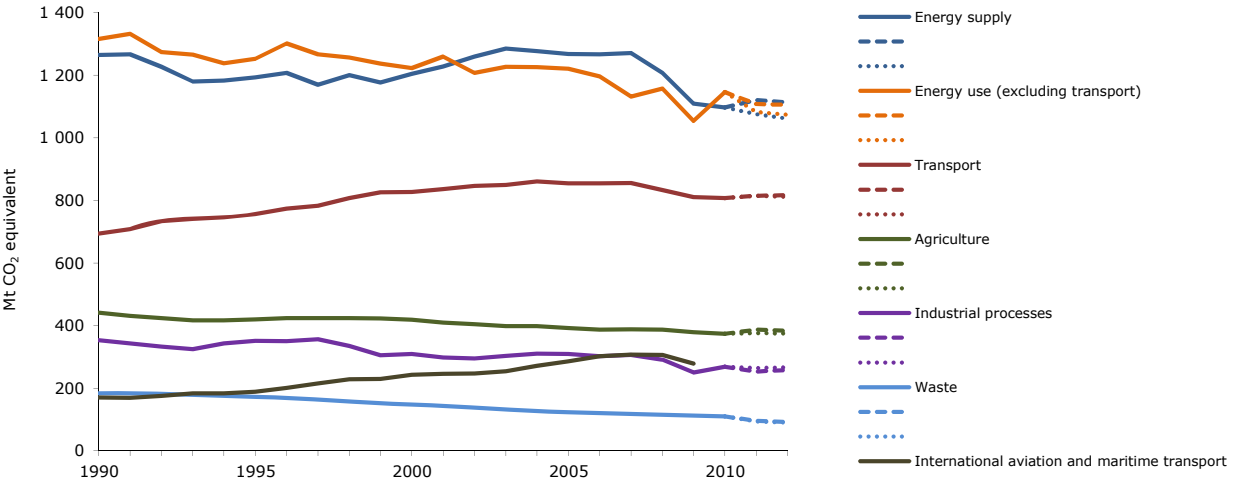
(8) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

(9) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2012 — emissions by sector

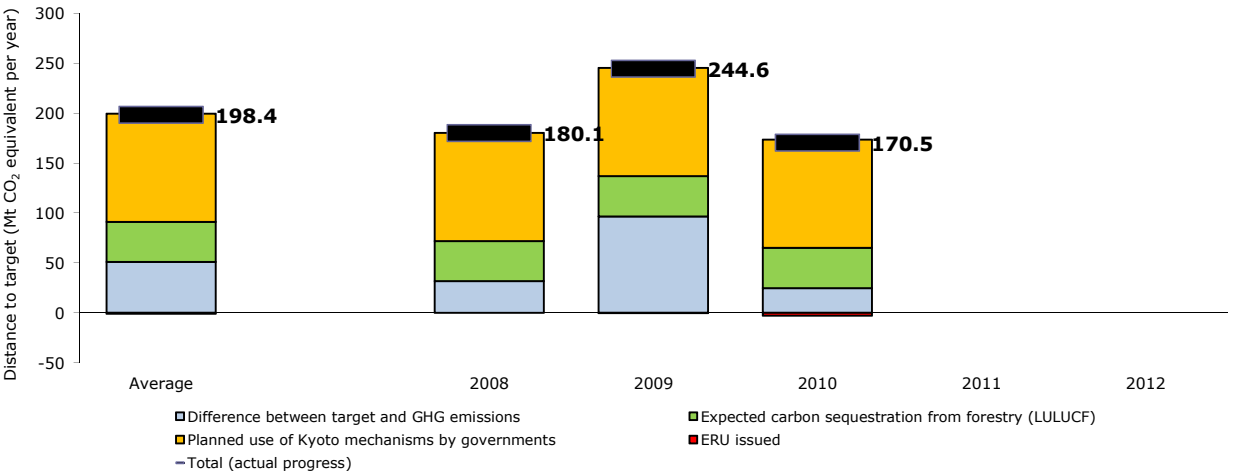


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in EU-15 were 9.9 % lower than the base-year level, below the Kyoto target of -8 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were lower than their respective target, by an amount equivalent to 1.2 % the country's base-year emissions. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 0.9 % of base-year level emissions. EU-15 intends to use the flexible mechanisms at government level by acquiring an amount of Kyoto units equivalent to 2.5 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in EU-15 were standing below their target level, by a gap representing 4.7 % of the base-year emissions. The EU-15 was therefore on track towards its Kyoto target by the end of 2010. Projections also show that over the full commitment period 2008–2012, EU-15 aggregated emissions will stay well below its Kyoto target with the current policies in place. However, failure by any Member State to comply with its burden-sharing target by the end of the commitment period could actually result in the non-achievement of its target by the EU-15.



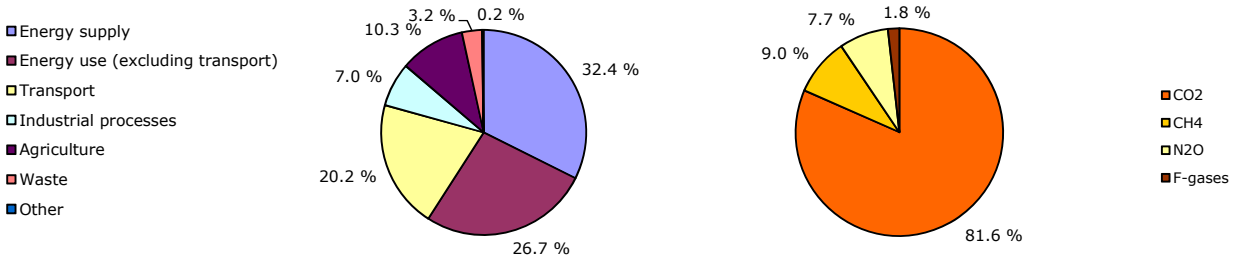
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in the EU-27

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	5 588.8	4 969.1	4 614.5	4 724.1	Mt CO_2-eq.	n.a.	n.a.
GHG from international bunkers ([4])	179.8	319.9	292.5	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG per capita	11.8	10.0	9.2	9.4	t CO_2-eq. / capita	n.a.	n.a.
GHG per GDP (constant prices) ([5])	735	462	448	450	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	n.a.	n.a.	n.a.	n.a.	%		
EU ETS verified emissions - all installations ([6])		2 100.2	1 860.1	1 913.2	Mt CO_2-eq.	n.a.	n.a.
EU ETS verified emissions - constant scope ([7])		2 098.5	1 856.1	1 894.4	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		42.3 %	40.3 %	40.5 %	%		
ETS verified emissions compared to annual allowances ([8])		5.3 %	– 8.5 %	– 7.4 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 974.3	– 17.4 %	– 354.5	– 7.1 %	– 864.7	– 15.5 %	109.6	2.4 %
GHG per capita	– 2.6	– 22.0 %	– 0.7	– 7.5 %	– 2.4	– 20.5 %	0.2	2.0 %
EU ETS verified emissions - all installations ([6])			– 240.2	– 11.4 %			53.1	2.9 %
EU ETS verified emissions - constant scope ([7])			– 242.4	– 11.6 %			– 242.4	– 11.6 %

Assessment of long-term GHG trend (1990–2009)

Leaving aside the 2009 economic recession, a wide range of factors and policies (climatic and non climatic) have contributed to the long-term decline in GHG emissions in the EU, particularly for CO2. These include improvements in the efficiency of transformation of primary energy into heat and electricity, the shift to less carbon-intensive fossil fuels (e.g. coal to gas) and the strong increase in renewable energy use. The largest changes occurred in the 1990s, during the period of restructuring of eastern Europe economies. However, emissions from road transportation, particularly the combustion of diesel in passenger cars and freight transport, have increased very rapidly. CO2emissions from international aviation and shipping, excluded from Kyoto targets, also increased very rapidly during the 20-year period. Consistent with warmer climatic conditions and higher comfort standards, the consumption of HFCs in air conditioning equipment and refrigeration were the only group of greenhouse gases that increased overall since 1990. The direct effects of the Montreal Protocol in reducing emissions of ozone-depleting substances have also indirectly contributed to significant reductions in emissions of some potent greenhouse gases such as CFCs. Other EU policies such as the Nitrates Directive, the Common Agriculture Policy (CAP) and the Landfill Waste Directive have also been successful in indirectly reducing greenhouse gas emissions from non- CO2 gases such as methane and nitrous oxides.

Assessment of short-term GHG trend (2008–2009)

The strength of the 2009 recession affected all economic sectors in the EU. Despite the relatively colder winter of 2009 emissions fell in the residential sector. In relative terms, the largest emission reductions occurred in industrial processes reflecting lower activity levels in the cement, chemical and iron and steel industries. Carbon intensity continued its downward trend in 2009, not so much because of fossil fuel switching but because coal use fell significantly more than oil or gas did. Along with the strong decline of primary consumption of fossil fuels (gas, coal, oil) the energy balances also show a very strong increase in renewable energy, particularly of wind and solar for electricity generation. In absolute terms, biomass still represented over 75 % of the increase in renewables in 2009. Overall, decreased demand for energy linked to the economic recession was accompanied by a strong increase in renewable energy use, which also contributed to lower emissions. Nuclear electricity production fell in 2009. HFCs from industrial processes were the only group of greenhouse gases that increased in 2009, continuing the long trend observed since 1990.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on EEA estimate of 2010 emissions.

([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

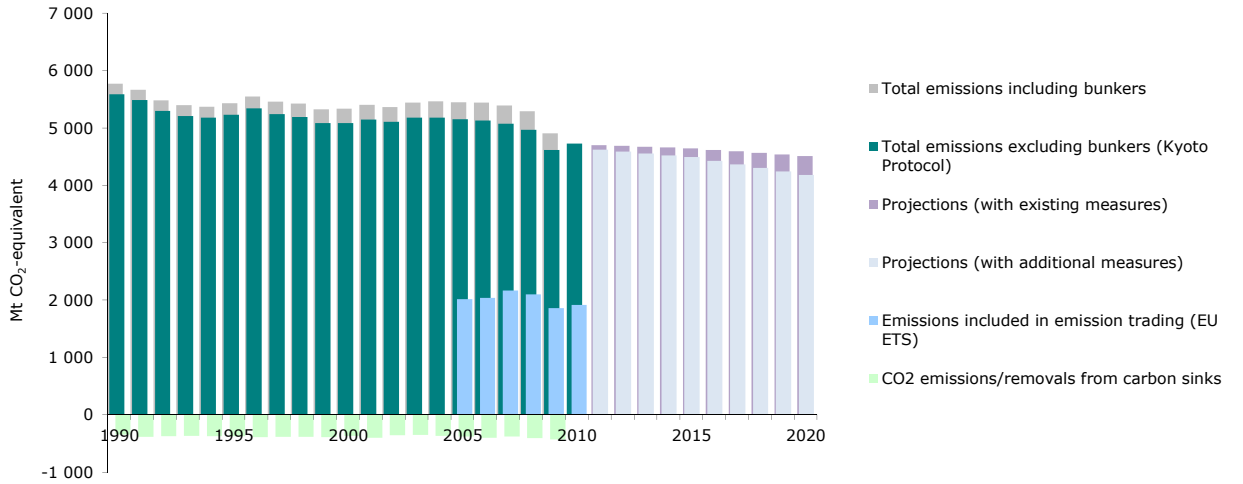
([6]) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

([7]) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

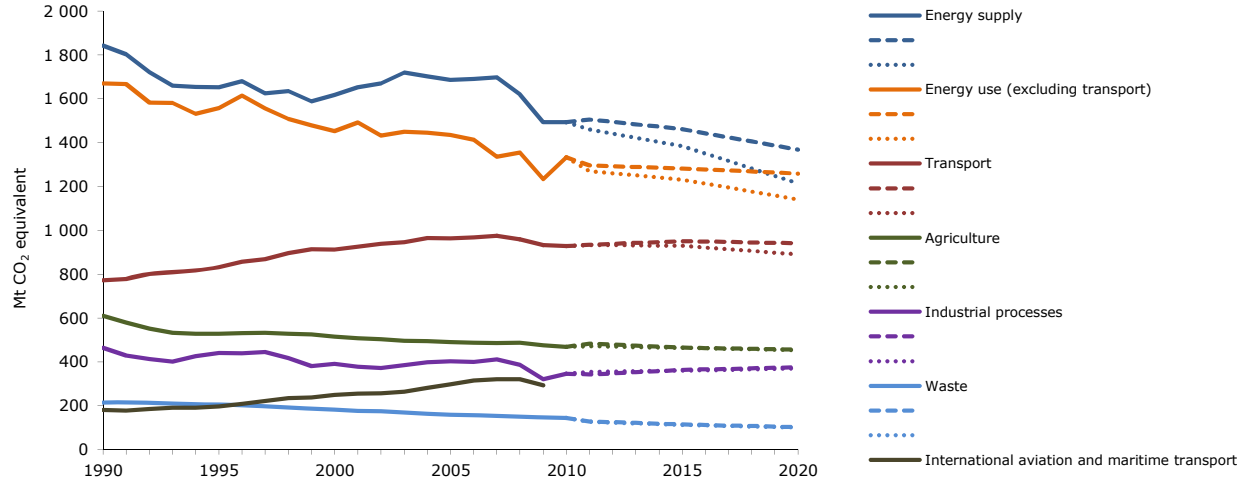
([8]) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector



Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

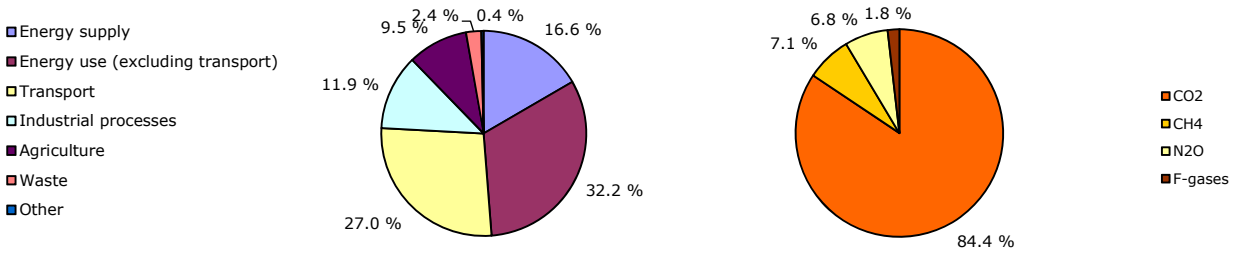
The EU-27 does not have a target under the Kyoto Protocol. Although recent estimates indicate a + 2.4 % emission increase in 2010, projections from Member States indicate that the long-term reduction trend observed since 1990 is expected to continue until 2020 and after. With the current set of measures in place, Member States do not project sufficient emission reductions to allow the EU to meet its unilateral 20 % reduction commitment by 2020. Additional measures, currently planned by Member States, will help in achieving this target but further policies will be needed to achieve even more important emission cuts in the long term.

GHG trends and projections in Austria

European Environment Agency

Key GHG data (1)	1990	2008	2009	2010 (2)	Unit	Rank in EU-27 (3)	Rank in EU-15 (3)
Total greenhouse gas emissions (GHG)	78.2	87.0	80.1	84.4	Mt CO_2-eq.	12	9
GHG from international bunkers (4)	0.9	2.2	1.9	n.a.	Mt CO_2-eq.	16	14
GHG per capita	10.2	10.5	9.6	10.1	t CO_2-eq. / capita	13	9
GHG per GDP (constant prices) (5)	483	353	338	349	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	1.4 %	1.8 %	1.7 %	1.8 %	%		
EU ETS verified emissions - all installations (6)		32.0	27.3	31.0	Mt CO_2-eq.	15	11
EU ETS verified emissions - constant scope (7)		32.0	27.3	30.7	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		36.8 %	34.1 %	36.7 %	%		
ETS verified emissions compared to annual allowances (8)		6.1 %	– 15.5 %	– 6.1 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 (1) (9)



Key GHG trends	1990–2009		2008–2009		1990–2010 (2)		2009–2010 (2)	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	1.9	2.4 %	– 6.9	– 7.9 %	6.2	8.0 %	4.4	5.4 %
GHG per capita	– 0.6	– 6.3 %	– 0.9	– 8.3 %	– 0.1	– 1.4 %	0.5	5.2 %
EU ETS verified emissions - all installations (6)			– 4.7	– 14.7 %			3.7	13.5 %
EU ETS verified emissions - constant scope (7)			– 4.7	– 14.7 %			– 4.7	– 14.7 %

Assessment of long-term GHG trend (1990–2009)

Emissions have overall increased since 1990, although data for recent years indicate a downward trend since 2005. The 9 % increase in CO2 emissions was mainly due to very significant increases in the transport sector (+ 56 % in emissions), although here also emissions have started levelling off since 2005. CH4 emissions decreased by 32 %, mainly due to lower emissions from solid waste disposal, while N2O emissions decreased by 13 % due to lower emissions from agricultural soils and emission reduction measures in the chemical industry. HFC emissions are 41 times higher in 2009 than in 1990, whereas PFC and SF6 emissions decreased by 97 % and 29 % over the period.

Assessment of short-term GHG trend (2008–2009)

Following an overall increase between 1999 and 2005, emissions decreased for the fourth consecutive year in 2009. Compared to 2008, emissions decreased by 7.9 % (CO2: – 8.6 %), mainly due to the economic recession which affected fuel consumption in the transport sector (freight transport on road), solid fuel use for electrical power generation as well as the industrial production of energy-intensive products (steel, cement). A further important reason for the emissions decrease was the increased use of renewables.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

(2) Based on national estimate of 2010 emissions.

(3) Comparison of 2009 values, 1 = highest value among EU countries.

(4) International bunkers: international aviation and international maritime transport.

(5) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

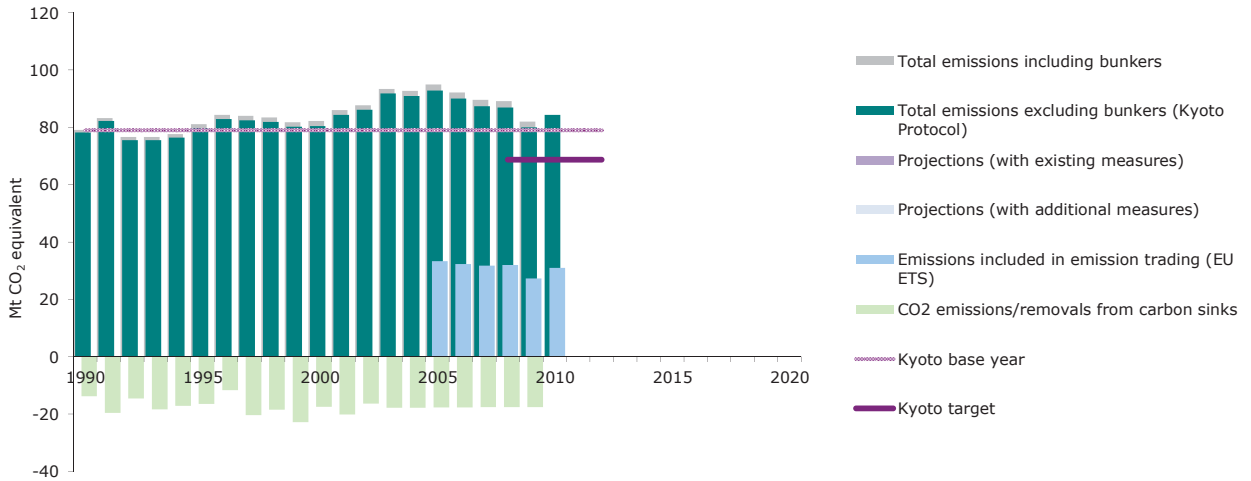
(6) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

(7) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

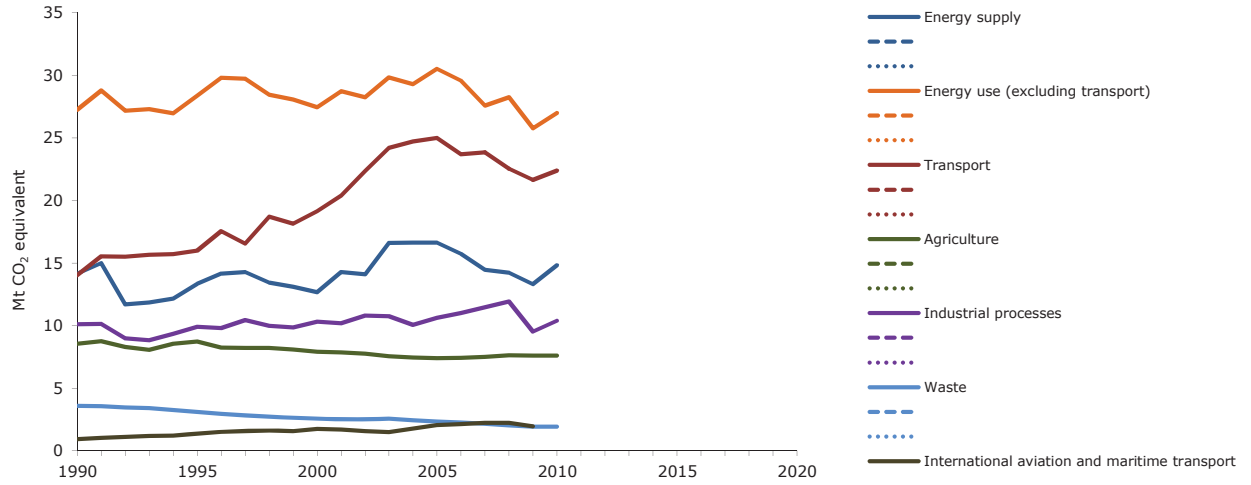
(8) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

(9) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

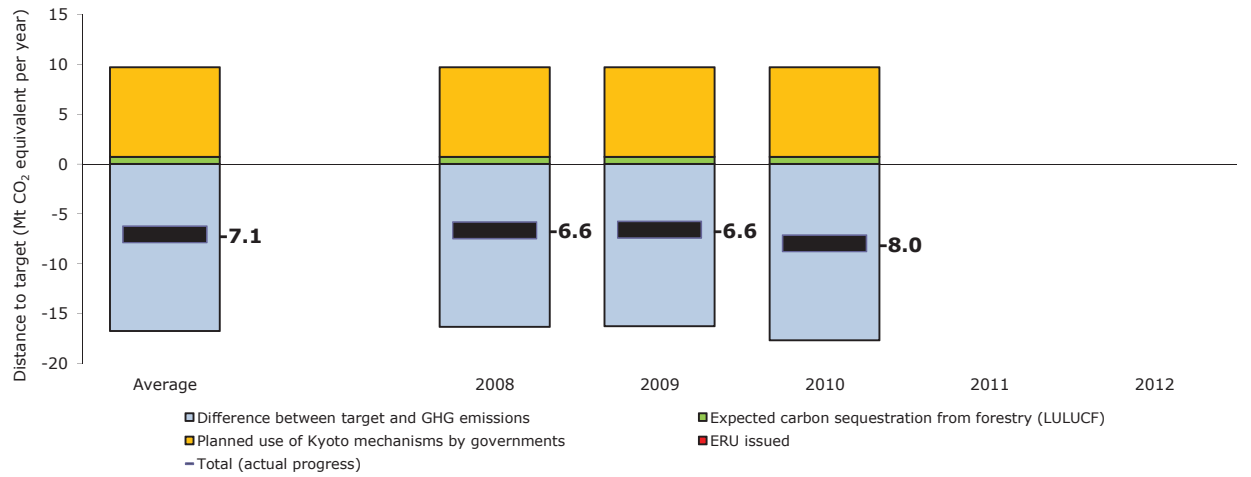


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Austria were 6 % higher than the base-year level, significantly above the burden-sharing target of -13 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly higher than their respective target, by an amount equivalent to 21.2 % the country's base-year emissions. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 0.9 % of base-year level emissions. Austria intends to use the flexible mechanisms at government level by acquiring an amount of Kyoto units equivalent to 11.4 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Austria were standing above their target level, by a gap representing 8.9 % of the base-year emissions. Austria was therefore not on track towards its burden-sharing target by the end of 2010.



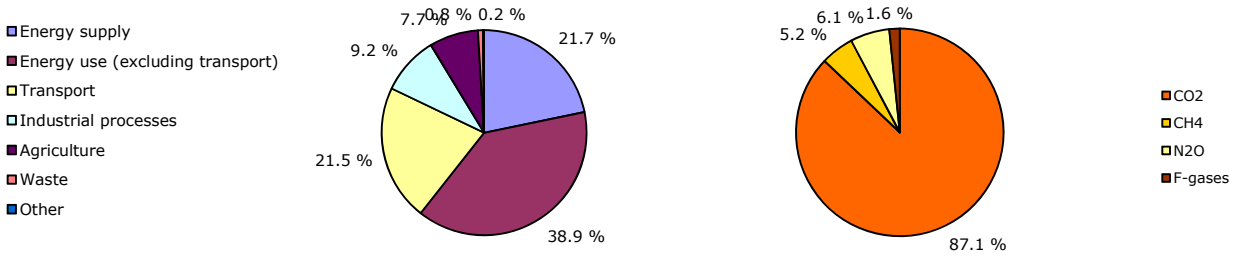
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Belgium

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	143.3	135.2	124.4	132.2	Mt CO_2-eq.	10	7
GHG from international bunkers ([4])	16.4	35.3	27.1	n.a.	Mt CO_2-eq.	5	5
GHG per capita	14.4	12.7	11.6	12.2	t CO_2-eq. / capita	8	5
GHG per GDP (constant prices) ([5])	708	464	440	457	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	2.6 %	2.7 %	2.7 %	2.8 %	%		
EU ETS verified emissions - all installations ([6])		55.5	46.2	50.1	Mt CO_2-eq.	11	8
EU ETS verified emissions - constant scope ([7])		55.5	46.1	46.7	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		41.0 %	37.1 %	37.9 %	%		
ETS verified emissions compared to annual allowances ([8])		0.1 %	– 18.6 %	– 10.5 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 18.9	– 13.2 %	– 10.7	– 7.9 %	– 11.2	– 7.8 %	7.7	6.2 %
GHG per capita	– 2.8	– 19.7 %	– 1.1	– 8.7 %	– 2.2	– 15.4 %	0.6	5.3 %
EU ETS verified emissions - all installations ([6])			– 9.3	– 16.7 %			3.9	8.4 %
EU ETS verified emissions - constant scope ([7])			– 9.4	– 16.9 %			– 9.4	– 16.9 %

Assessment of long-term GHG trend (1990–2009)

Total emissions appear to have remained relatively stable between 1990 and 2004 and have begun decreasing since (although they slightly increased in 2008). A closer look at sectoral trends indicates opposing factors: a sharp increase in road transport emissions (+ 30 %) combined with an increase of emissions from buildings in the commercial sector (+ 40 %), which was counterbalanced by emission reductions in the other sectors, particularly energy use from manufacturing industries (– 40 %) and energy supply (– 8 %).

Assessment of short-term GHG trend (2008–2009)

Compared to 2008, 2009 emissions decreased by 7.9 %. As a consequence of the economic crisis, fuel-related emissions from manufacturing industries and process-related emissions from the mineral and, iron and steel industries decreased most. Even though final energy demand declined, this strong emission reduction was partly offset by increasing emissions from public electricity and heat production (electricity imports fell by 117 % between 2008 and 2009). The increase in renewables also contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on EEA estimate of 2010 emissions.

([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

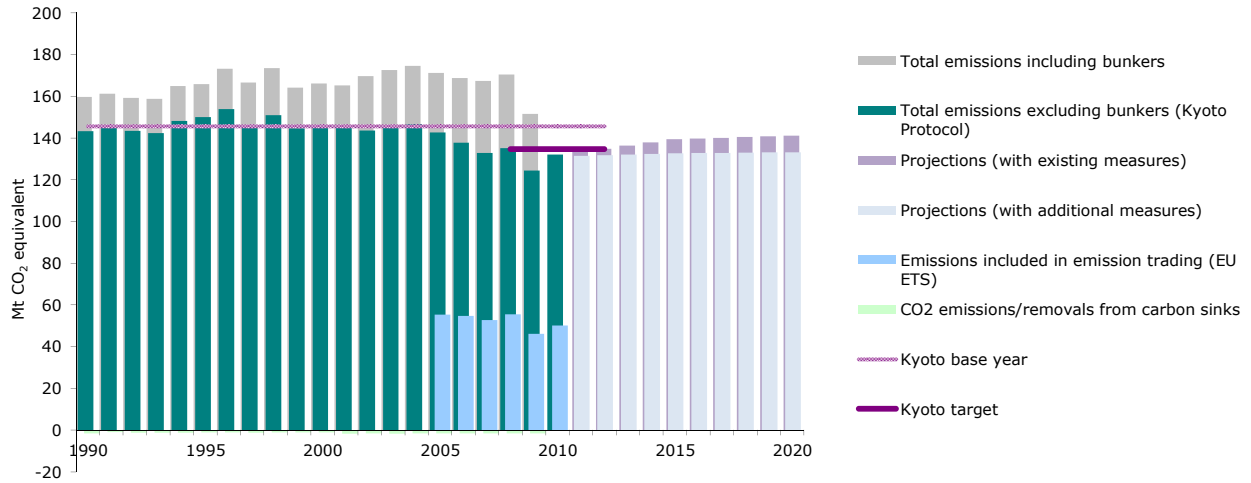
([6]) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

([7]) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

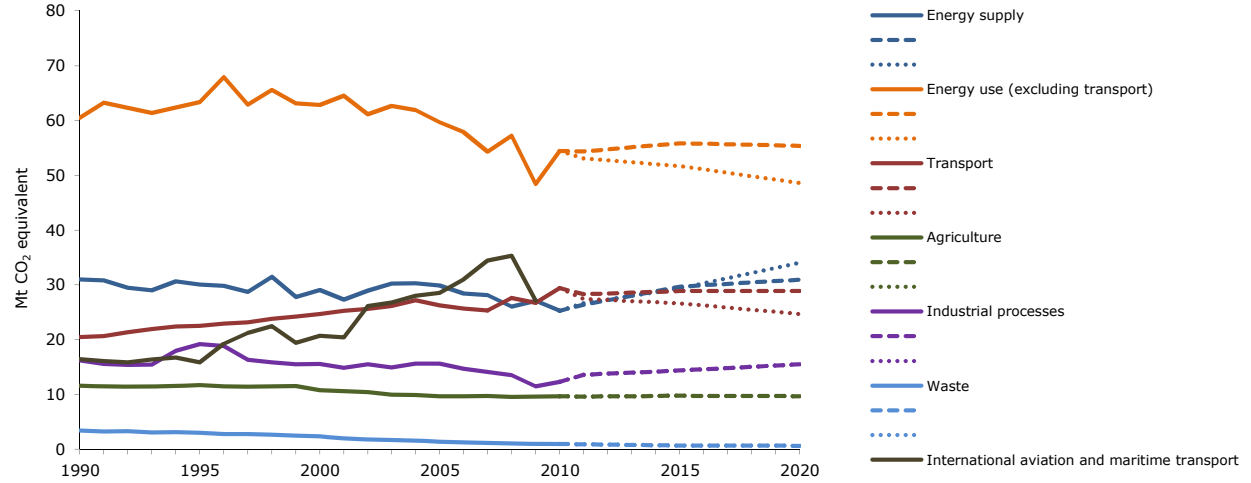
([8]) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

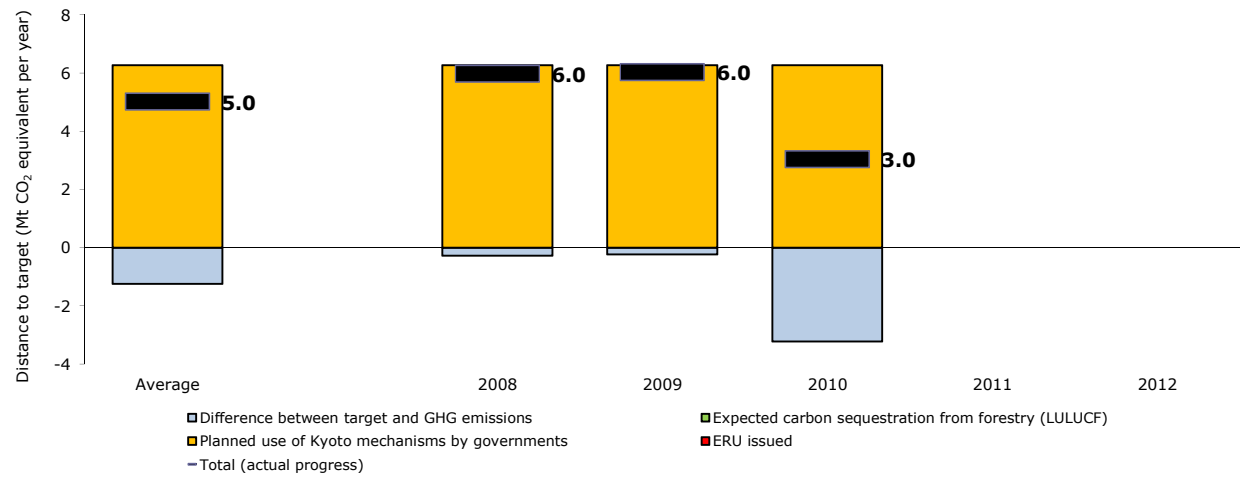


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Belgium were 10.4 % lower than the base-year level, below the burden-sharing target of -7.5 % for the period 2008–2012. However, in the sectors not covered by the EU ETS, emissions were higher than their respective target, by an amount equivalent to 0.9 % the country's base-year emissions. Belgium intends to use the flexible mechanisms at government level by acquiring an amount of Kyoto units equivalent to 4.3 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Belgium were standing below their target level, by a gap representing 3.4 % of the base-year emissions. Belgium was therefore on track towards its burden-sharing target by the end of 2010.



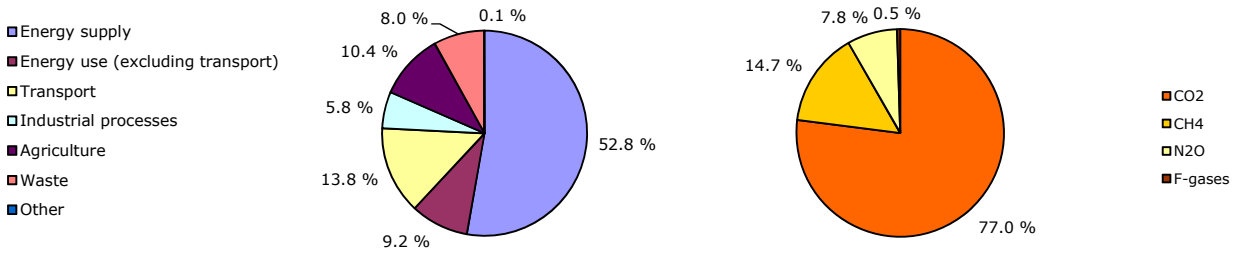
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Bulgaria

European Environment Agency

Key GHG data (1)	1990	2008	2009	2010 (2)	Unit	Rank in EU-27 (3)	Rank in EU-15 (3)
Total greenhouse gas emissions (GHG)	111.4	69.0	59.5	59.1	Mt CO_2-eq.	19	n.a.
GHG from international bunkers (4)	1.0	1.0	1.2	n.a.	Mt CO_2-eq.	19	n.a.
GHG per capita	12.7	9.0	7.8	7.8	t CO_2-eq. / capita	20	n.a.
GHG per GDP (constant prices) (5)	5 992	3 129	2 853	2 827	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	2.0 %	1.4 %	1.3 %	1.3 %	%		
EU ETS verified emissions - all installations (6)		38.3	32.0	33.5	Mt CO_2-eq.	13	n.a.
EU ETS verified emissions - constant scope (7)		38.3	32.0	33.5	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		55.5 %	53.8 %	56.7 %	%		
ETS verified emissions compared to annual allowances (8)		0.0 %	– 21.2 %	– 4.8 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 (1) (9)



Key GHG trends	1990–2009		2008–2009		1990–2010 (2)		2009–2010 (2)	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 51.9	– 46.6 %	– 9.5	– 13.8 %	– 52.3	– 47.0 %	– 0.4	– 0.7 %
GHG per capita	– 4.9	– 38.4 %	– 1.2	– 13.4 %	– 4.9	– 38.6 %	– 0.0	– 0.2 %
EU ETS verified emissions - all installations (6)			– 6.3	– 16.4 %			1.5	4.7 %
EU ETS verified emissions - constant scope (7)			– 6.3	– 16.5 %			– 6.3	– 16.5 %

Assessment of long-term GHG trend (1990–2009)

Emissions decreased sharply in the 1990s in all sectors, due to economic restructuring. They remained relatively stable between 1999 and 2007 and decreased afterwards. Remarkable emission decreases occurred in the production of public electricity and heat, in manufacturing industries and in chemical industries. In the agriculture sector, emissions decreased by over 70 %. In the waste sector, emissions were reduced through improved solid waste management.

Assessment of short-term GHG trend (2008–2009)

The relative decrease in emissions compared to 2008 was the third largest across the whole EU. Reductions took place mainly in fuel-related emissions from public electricity and heat and from manufacturing industries, as well as in process-related emissions from mineral and, iron and steel production. Emissions from agriculture and waste also declined. The increase in renewables also contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

(2) Based on EEA estimate of 2010 emissions.

(3) Comparison of 2009 values, 1 = highest value among EU countries.

(4) International bunkers: international aviation and international maritime transport.

(5) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

(6) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

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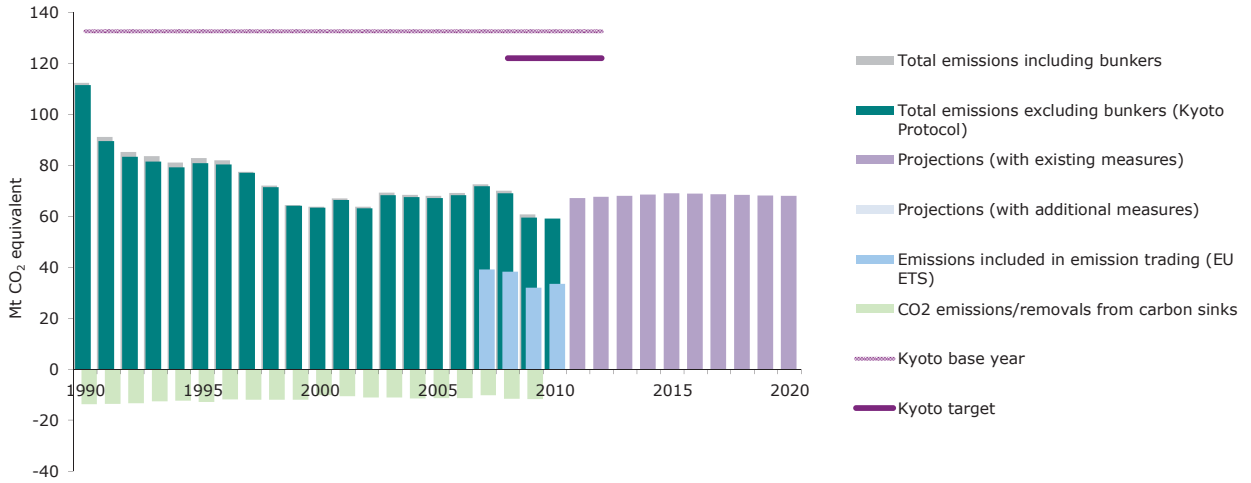
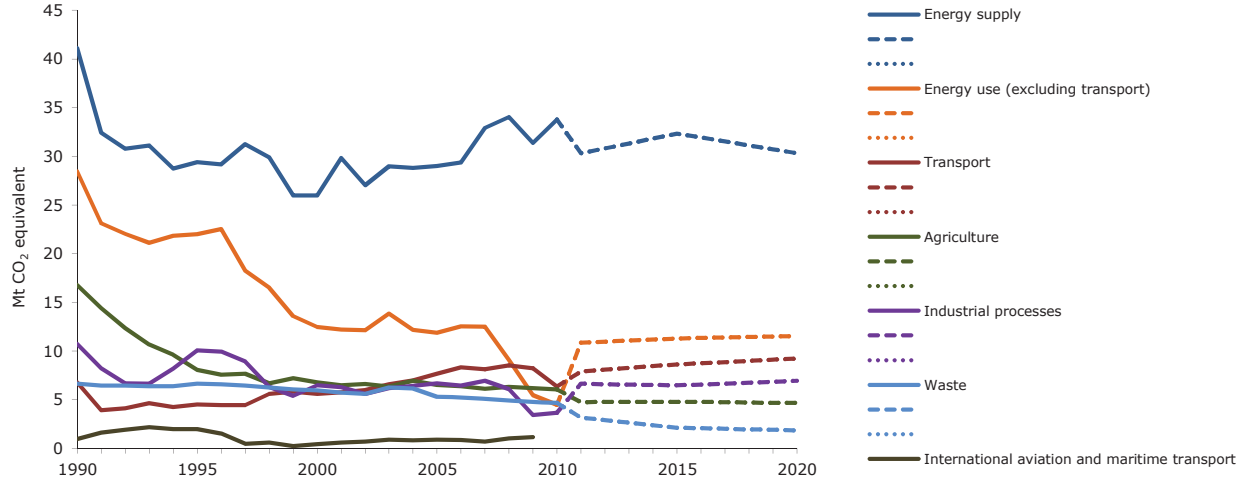
(8) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

(9) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

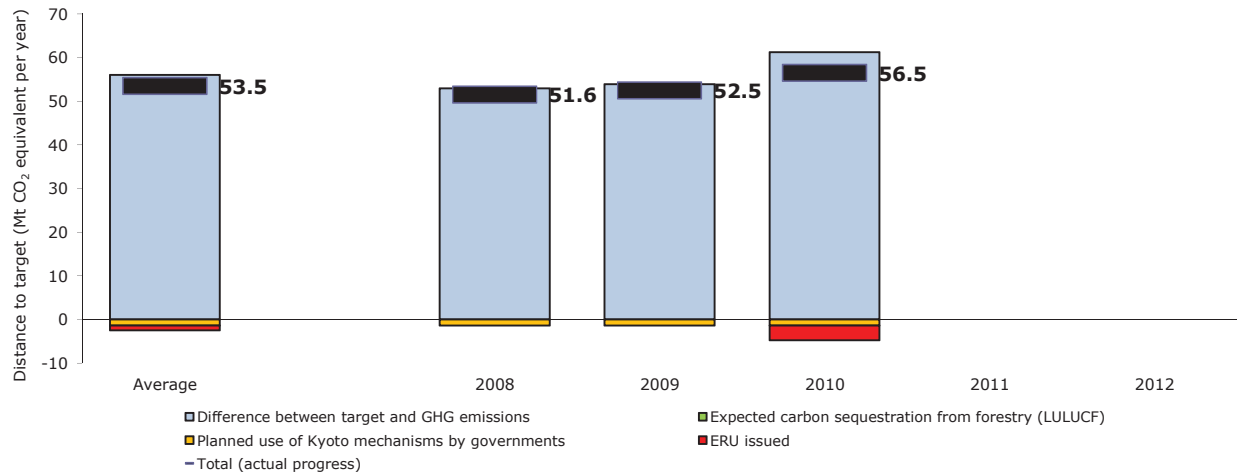


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Bulgaria were 52.9 % lower than the base-year level, well below the Kyoto target of -8 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly lower than their respective target, by an amount equivalent to 42.3 % the country's base-year emissions. Bulgaria intends to use the flexible mechanisms at government level by selling an amount of Kyoto units equivalent to 1.1 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Bulgaria were standing below their target level, by a gap representing 40.4 % of the base-year emissions. Bulgaria was therefore on track towards its Kyoto target by the end of 2010.



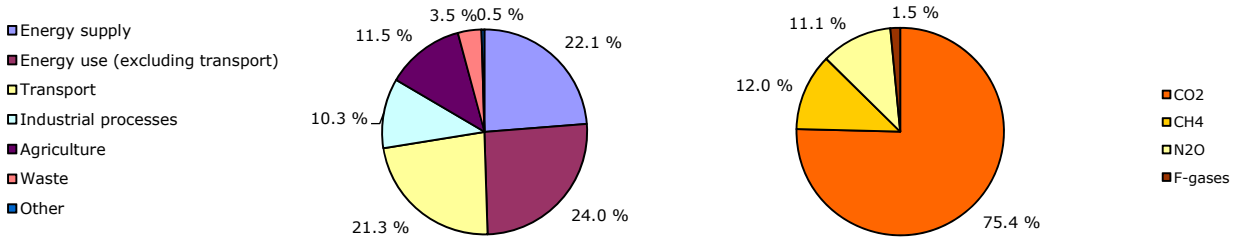
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Croatia

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	31.4	31.0	28.9	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG from international bunkers ([4])	0.5	0.3	0.3	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG per capita	6.6	7.0	6.5	n.a.	t CO_2-eq. / capita	n.a.	n.a.
GHG per GDP (constant prices) ([5])	1 165	948	940	0	g CO_2-eq. / euro		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 2.6	– 8.2 %	– 2.1	– 6.8 %	n.a.	n.a.	n.a.	n.a.
GHG per capita	– 0.1	– 1.2 %	– 0.5	– 6.7 %	n.a.	n.a.	n.a.	n.a.

Assessment of long-term GHG trend (1990–2009)

The overall decline of economic activities and energy consumption in the period 1991–1994, which was mainly the consequence of the war in Croatia, led to a decrease in total emissions of greenhouse gases in that period. The transition of the economy resulted in a reduction of the activity of some energy-intensive industries or the phase out of certain productions (e.g. blast furnaces, primary aluminium production, and coke plant). Emissions started to rise in 1995 at an average rate of 3 per cent per year, increased until 2007 and decreased afterward. The main increase in GHG emissions during the period 1995–2008 occurred in the energy sector (in particular production of public electricity and heat and transport), industrial processes (production of cement, lime, ammonia and nitric acid, and consumption of HFCs) and in the waste sector. Lately, cement, lime, ammonia and nitric acid producers reached their highest producing capacity which has been reflected on emission levels. Waste disposal on land, as well as wastewater handling, have the greatest impact on emission increase in waste sector. In the agriculture sector, the number of cattle decreased continuously between 1990 and 2000 period, which led to important CH4 emission reductions. The number of cattle started to increase again in 2000, until 2006.

Assessment of short-term GHG trend (2008–2009)

The decrease in GHG emissions was mainly due to favourable hydrological conditions, which led to a 23.7 % increase in hydropower production and a 46.6 % decrease in the consumption of coal and coke due to a decrease of working hours in TPP Plomin 2. The reduction of economic activity affected the production of cement (– 22.5 %), lime (– 35.7 %), ammonia (– 15.7 %) and iron and steel (– 66.7 %). This decrease in economic activity had direct consequences on emission levels in these sectors. The increase in renewables also contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on EEA estimate of 2010 emissions.

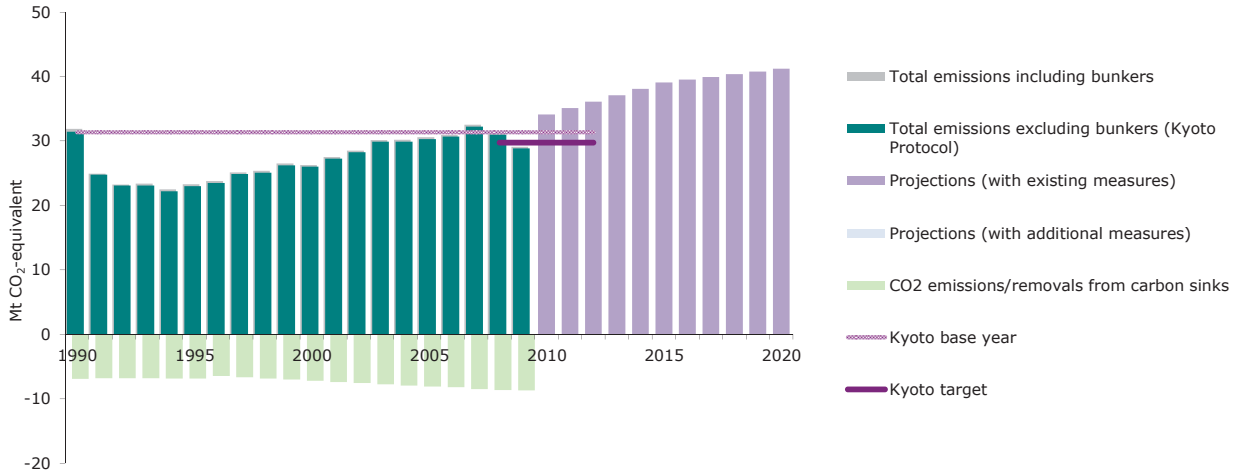
([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

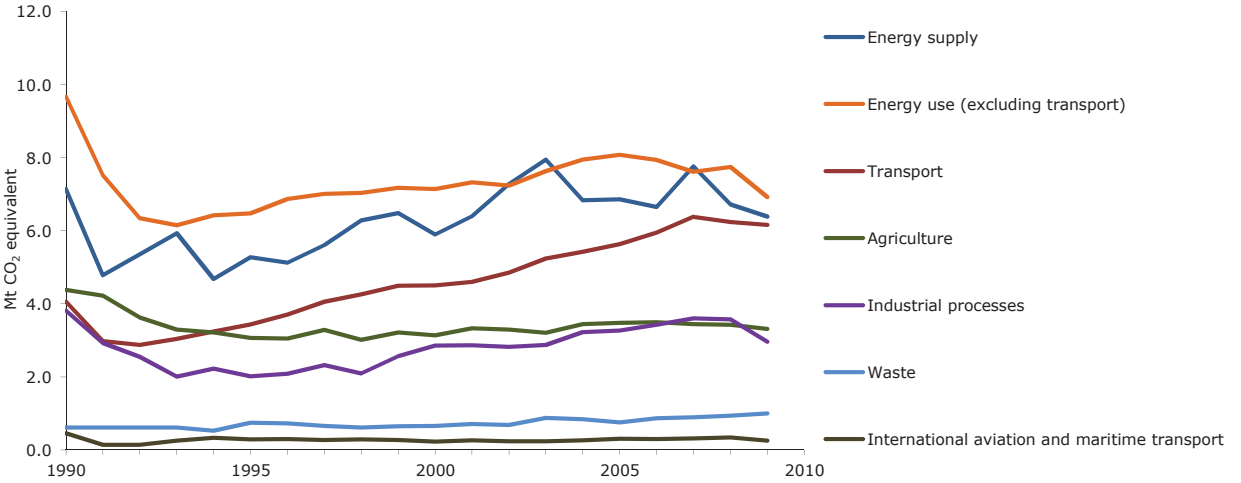
([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



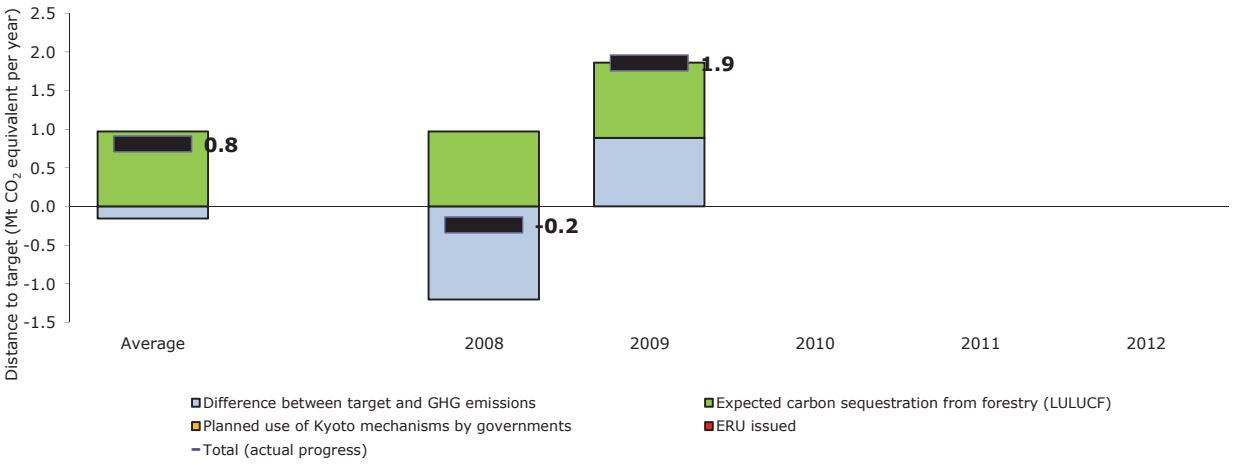
GHG trends 1990–2009 - emissions by sector



Source: National GHG inventory, 2011. See: http://dataservice.eea.europa.eu/PivotApp/pivot.aspx?pivotid=475

Progress towards Kyoto target

Average 2008–2009 emissions in Croatia were 4.5 % lower than the base-year level, above the Kyoto target of -5 % for the period 2008–2012. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 3.1 % of base-year level emissions. Taking all these effects in to account, average emissions Croatia were standing below their target level, by a gap representing 2.6 % of the base-year emissions. Croatia was therefore on track towards its Kyoto target by the end of 2009.



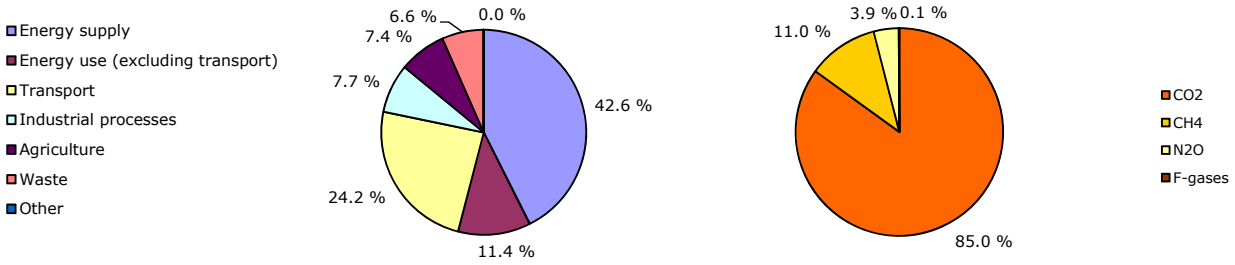
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Cyprus

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	5.3	10.2	9.4	9.2	Mt CO_2-eq.	26	n.a.
GHG from international bunkers ([4])	0.9	1.3	1.1	n.a.	Mt CO_2-eq.	21	n.a.
GHG per capita	9.2	12.9	11.8	11.5	t CO_2-eq. / capita	7	n.a.
GHG per GDP (constant prices) ([5])	816	760	713	693	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	0.1 %	0.2 %	0.2 %	0.2 %	%		
EU ETS verified emissions - all installations ([6])		5.6	5.4	n.a.	Mt CO_2-eq.	24	n.a.
Share of EU ETS verified emissions (all installations) in total GHG		54.8 %	57.0 %	n.a.	%		
ETS verified emissions compared to annual allowances ([8])		15.8 %	5.4 %	n.a.	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	4.1	78.3 %	– 0.8	– 7.7 %	4.0	75.1 %	– 0.2	– 1.8 %
GHG per capita	2.6	28.1 %	– 1.1	– 8.6 %	2.3	24.9 %	– 0.3	– 2.5 %
EU ETS verified emissions - all installations ([6])			– 0.2	– 3.9 %			n.a.	n.a.

Assessment of long-term GHG trend (1990–2009)

Except for brief periods of decreases (1995, 2009) or of stabilisation (2000–2003), emissions have overall been increasing since the early 1990s, driven by sustained economic development (reflected for example in the very large increase in transport emissions). The strong emission increase (+ 78 %) is mainly due to public electricity and heat production (+ 134 %) as well as emissions from road transport (+ 190 %).

Assessment of short-term GHG trend (2008–2009)

As a result of the economic crisis, 2009 fuel-related emissions from manufacturing industries and process-related emissions from cement production decreased most. In addition, emissions from agriculture declined considerably. The sustained growth in the use of renewables also contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on EEA estimate of 2010 emissions.

([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

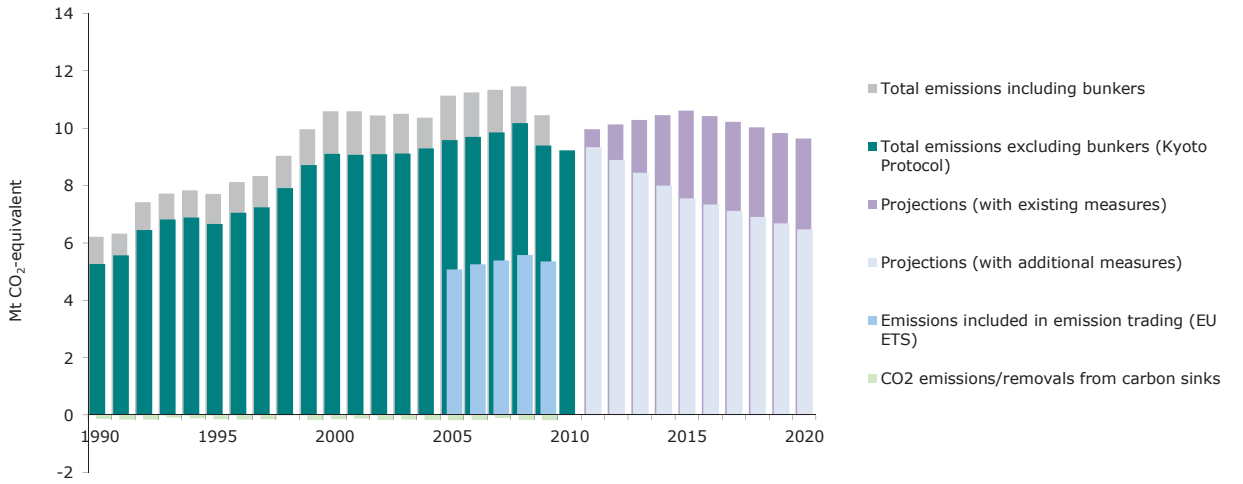
([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

([6]) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

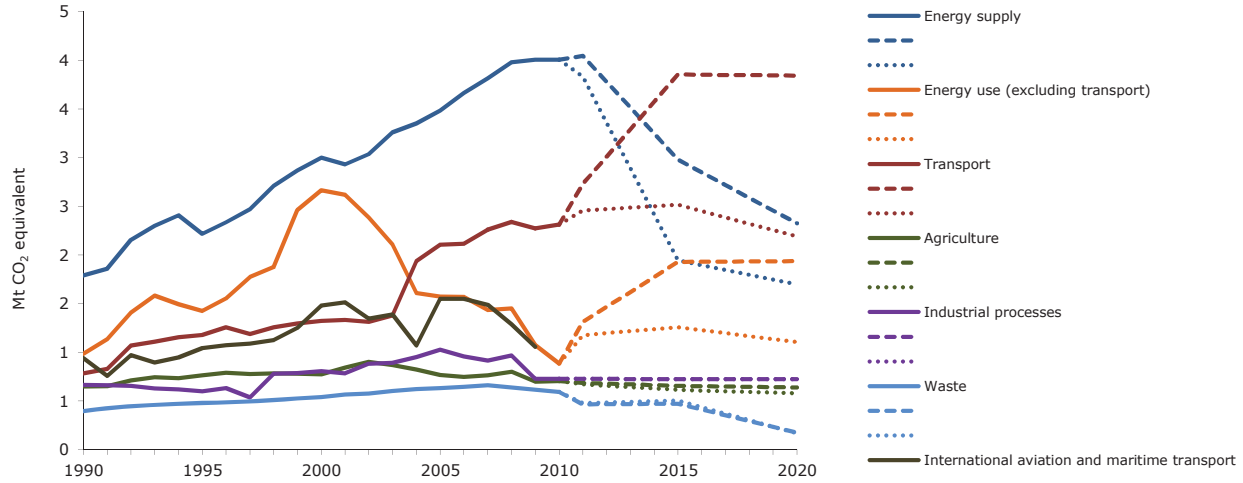
([8]) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector



Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

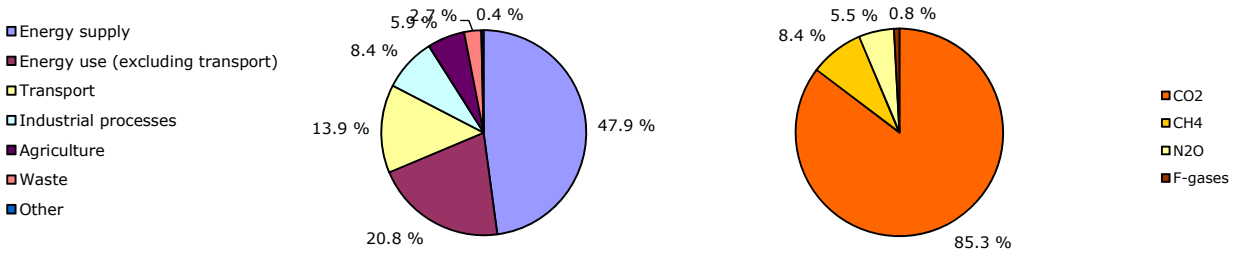
Cyprus does not have a target under the Kyoto Protocol.

GHG trends and projections in the Czech Republic

European Environment Agency

Key GHG data (1)	1990	2008	2009	2010 (2)	Unit	Rank in EU-27 (3)	Rank in EU-15 (3)
Total greenhouse gas emissions (GHG)	195.5	141.1	132.9	135.6	Mt CO_2-eq.	8	n.a.
GHG from international bunkers (4)	0.7	1.2	1.1	n.a.	Mt CO_2-eq.	20	n.a.
GHG per capita	18.9	13.6	12.7	12.9	t CO_2-eq. / capita	3	n.a.
GHG per GDP (constant prices) (5)	3 261	1 645	1 616	1 611	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	3.5 %	2.8 %	2.9 %	2.9 %	%		
EU ETS verified emissions - all installations (6)		80.4	73.8	75.6	Mt CO_2-eq.	8	n.a.
EU ETS verified emissions - constant scope (7)		80.4	73.8	73.8	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		57.0 %	55.5 %	55.7 %	%		
ETS verified emissions compared to annual allowances (8)		– 6.0 %	– 14.2 %	– 12.3 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 (1) (9)



Key GHG trends	1990–2009		2008–2009		1990–2010 (2)		2009–2010 (2)	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 62.6	– 32.0 %	– 8.2	– 5.8 %	– 59.9	– 30.6 %	2.7	2.0 %
GHG per capita	– 6.2	– 32.7 %	– 0.9	– 6.6 %	– 6.0	– 31.6 %	0.2	1.6 %
EU ETS verified emissions - all installations (6)			– 6.6	– 8.2 %			1.8	2.4 %
EU ETS verified emissions - constant scope (7)			– 6.6	– 8.2 %			– 6.6	– 8.2 %

Assessment of long-term GHG trend (1990–2009)

Total emissions strongly decreased in the early 1990s due to the economic restructuring (transition to the market economy), but slowly increased between 2000 and 2007. They decreased strongly in 2008 and 2009. The overall decrease affected primarily the energy sector (– 30 %), due to lower fuel consumption in manufacturing industry and in households and to switching from coal to natural gas. On the other hand, emissions from transport more than doubled (+ 140 %) — an increase which was overall practically compensated by a sharp decrease in agricultural emissions (– 99 %) and emissions from industrial processes (– 43 %).

Assessment of short-term GHG trend (2008–2009)

Emissions decreased for the second consecutive year, affected by the effects of the economic crisis. Emissions from public electricity and heat production and process-related emissions from manufacturing industries (in particular from cement production and iron and steel production) decreased most. Furthermore, transport emissions decreased for the second year in a row. The increase in renewables also contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

(2) Based on EEA estimate of 2010 emissions.

(3) Comparison of 2009 values, 1 = highest value among EU countries.

(4) International bunkers: international aviation and international maritime transport.

(5) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

(6) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

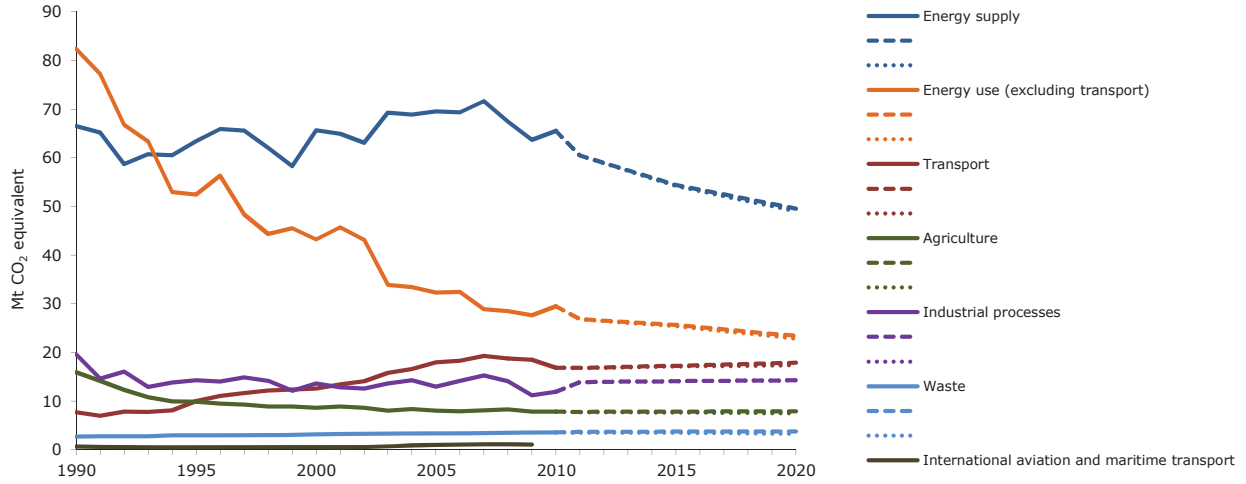
(7) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

(8) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

(9) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions

GHG trends and projections 1990–2020 — emissions by sector

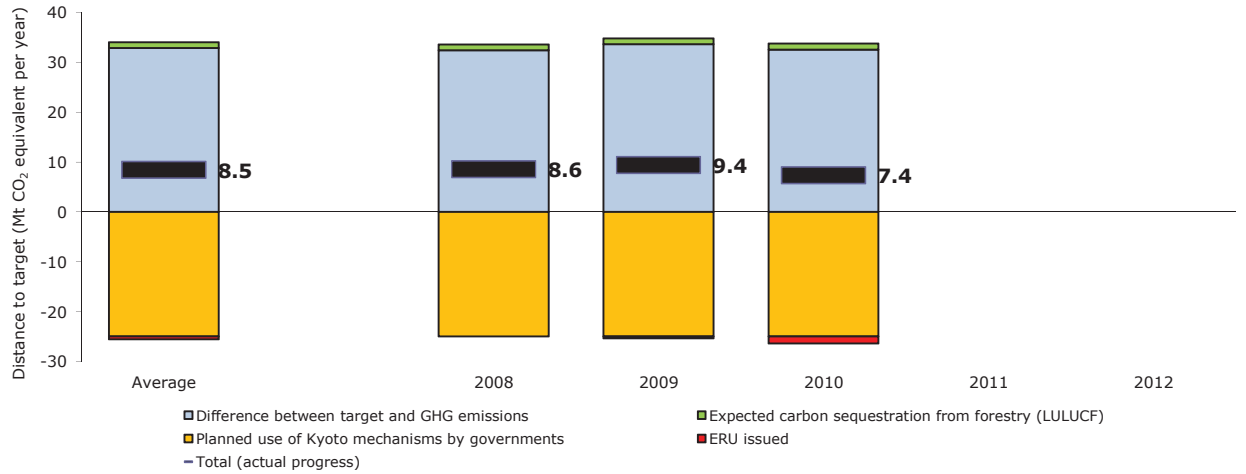


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Czech Republic were 29.7 % lower than the base-year level, well below the Kyoto target of -8 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly lower than their respective target, by an amount equivalent to 16.9 % the country's base-year emissions. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 0.6 % of base-year level emissions. Czech Republic intends to use the flexible mechanisms at government level by selling an amount of Kyoto units equivalent to 12.9 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Czech Republic were standing below their target level, by a gap representing 4.4 % of the base-year emissions. The Czech Republic was therefore on track towards its Kyoto target by the end of 2010.



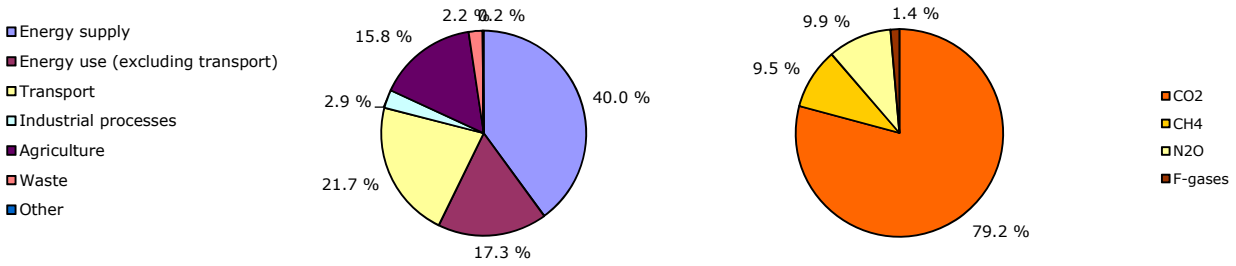
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Denmark

European Environment Agency

Key GHG data (1)	1990	2008	2009	2010 (2)	Unit	Rank in EU-27 (3)	Rank in EU-15 (3)
Total greenhouse gas emissions (GHG)	68.0	63.7	61.0	61.4	Mt CO_2-eq.	17	13
GHG from international bunkers (4)	4.8	5.5	3.9	n.a.	Mt CO_2-eq.	11	11
GHG per capita	13.2	11.6	11.1	11.1	t CO_2-eq. / capita	10	7
GHG per GDP (constant prices) (5)	506	332	335	330	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	1.2 %	1.3 %	1.3 %	1.3 %	%		
EU ETS verified emissions - all installations (6)		26.5	25.5	25.3	Mt CO_2-eq.	16	12
EU ETS verified emissions - constant scope (7)		26.5	25.5	25.3	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		41.7 %	41.7 %	41.2 %	%		
ETS verified emissions compared to annual allowances (8)		10.7 %	6.5 %	5.7 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 (1) (9)



Key GHG trends	1990–2009		2008–2009		1990–2010 (2)		2009–2010 (2)	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 7.0	– 10.3 %	– 2.7	– 4.2 %	– 6.6	– 9.7 %	0.40	0.7 %
GHG per capita	– 2.2	– 16.4 %	– 0.6	– 4.8 %	– 2.2	– 16.5 %	– 0.01	– 0.1 %
EU ETS verified emissions - all installations (6)			– 1.08	– 4.1 %			– 0.19	– 0.8 %
EU ETS verified emissions - constant scope (7)			– 1.09	– 4.1 %			– 1.09	– 4.1 %

Assessment of long-term GHG trend (1990–2009)

The large fluctuations of total emissions reflect the inter-country electricity trade in the Nordic energy market. Thus, the high emissions in 1991, 1996, 2003 and 2006 reflect a large electricity export while low emissions in 1990 and 2005 were due to la

Assessment of short-term GHG trend (2008–2009)

Emissions decreased for the third consecutive year. The annual decrease is mainly related to decreased fuel use in industry and declining process-related emissions from cement production (cement production itself dropped by 34 %). Transport emissions also

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

(2) Based on national estimate of 2010 emissions.

(3) Comparison of 2009 values, 1 = highest value among EU countries.

(4) International bunkers: international aviation and international maritime transport.

(5) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

(6) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

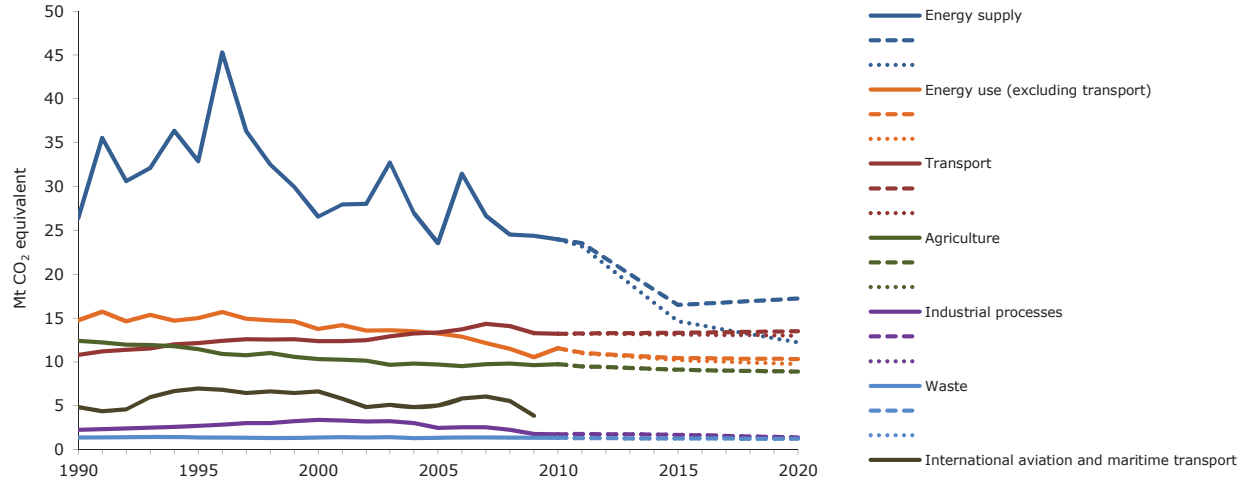
(7) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

(8) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

(9) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions

GHG trends and projections 1990–2020 — emissions by sector

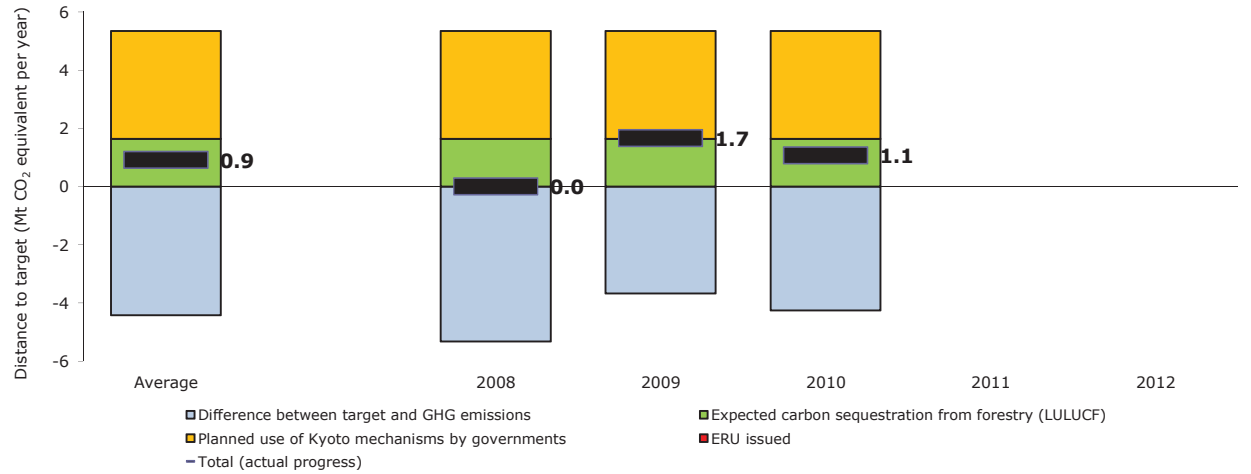


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Denmark were 10.6 % lower than the base-year level, significantly above the burden-sharing target of -21 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly higher than their respective target, by an amount equivalent to 6.4 % the country's base-year emissions. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 2.4 % of base-year level emissions. Denmark intends to use the flexible mechanisms at government level by acquiring an amount of Kyoto units equivalent to 5.3 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Denmark were standing below their target level, by a gap representing 1.3 % of the base-year emissions. Denmark was therefore on track towards its burden-sharing target by the end of 2010.



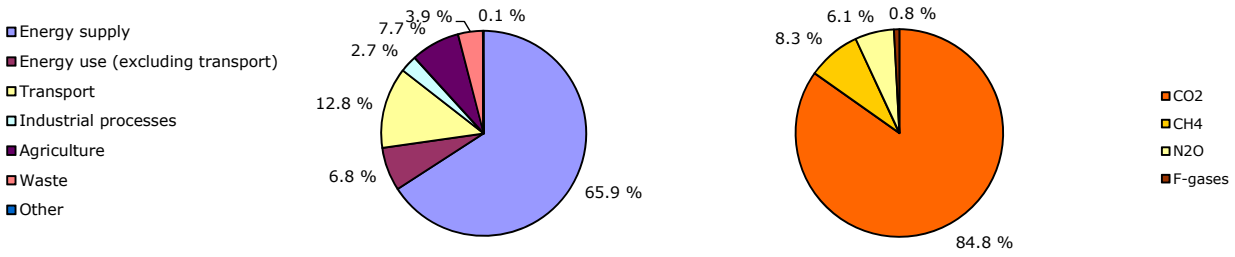
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Estonia

European Environment Agency

Key GHG data (1)	1990	2008	2009	2010 (2)	Unit	Rank in EU-27 (3)	Rank in EU-15 (3)
Total greenhouse gas emissions (GHG)	41.1	20.1	16.8	20.2	Mt CO_2-eq.	23	n.a.
GHG from international bunkers (4)	0.7	0.9	0.8	n.a.	Mt CO_2-eq.	23	n.a.
GHG per capita	26.1	15.0	12.6	15.1	t CO_2-eq. / capita	4	n.a.
GHG per GDP (constant prices) (5)	4 900	1 982	1 931	2 248	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	0.7 %	0.4 %	0.4 %	0.4 %	%		
EU ETS verified emissions - all installations (6)		13.5	10.3	14.4	Mt CO_2-eq.	21	n.a.
EU ETS verified emissions - constant scope (7)		13.5	10.3	14.4	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		67.5 %	61.3 %	71.4 %	%		
ETS verified emissions compared to annual allowances (8)		15.9 %	– 12.9 %	21.6 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 (1) (9)



Key GHG trends	1990–2009		2008–2009		1990–2010 (2)		2009–2010 (2)	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 24.2	– 59.0 %	– 3.2	– 16.1 %	– 20.8	– 50.8 %	3.4	20.0 %
GHG per capita	– 13.6	– 51.9 %	– 2.4	– 16.1 %	– 11.1	– 42.3 %	2.5	20.1 %
EU ETS verified emissions - all installations (6)			– 3.2	– 23.8 %			4.1	39.7 %
EU ETS verified emissions - constant scope (7)			– 3.2	– 23.8 %			– 3.2	– 23.8 %

Assessment of long-term GHG trend (1990–2009)

The decrease in total emissions was mainly caused by the transition from planned to market economy and the implementation of reforms, after Estonia's independence in 1991. Over the period 1990–2009, energy-related emissions decreased by 60 %, mainly due to the closing of factories which reduced the fuel consumption of energy industries. Emissions from agriculture fell by 57 % and waste emissions decreased by 16 %. During the same period, emissions from industrial processes were subject to great variability and dropped sharply in 2009.

Assessment of short-term GHG trend (2008–2009)

Estonia had the highest relative emission decrease in Europe between 2008 and 2009 (– 16 %). The effects of the economic recession were reflected by an 18 % decrease in electricity generation by conventional thermal power plants and a decrease in electricity exports. Additionally, transport emissions decreased for the second consecutive year, as well as process-related emissions from the mineral and chemical industries. The increase in renewables also contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

(2) Based on EEA estimate of 2010 emissions.

(3) Comparison of 2009 values, 1 = highest value among EU countries.

(4) International bunkers: international aviation and international maritime transport.

(5) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

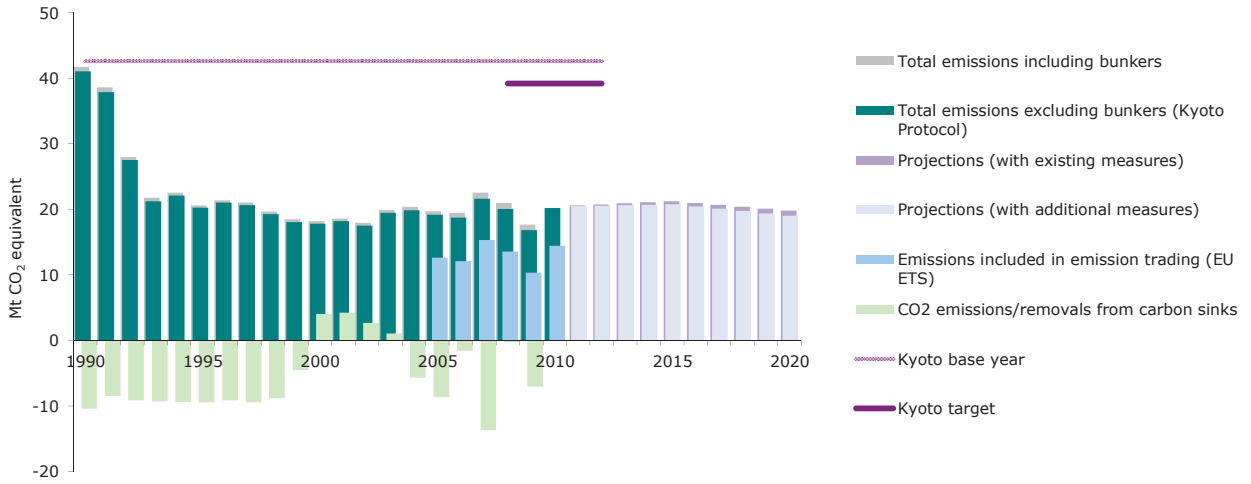
(6) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

(7) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

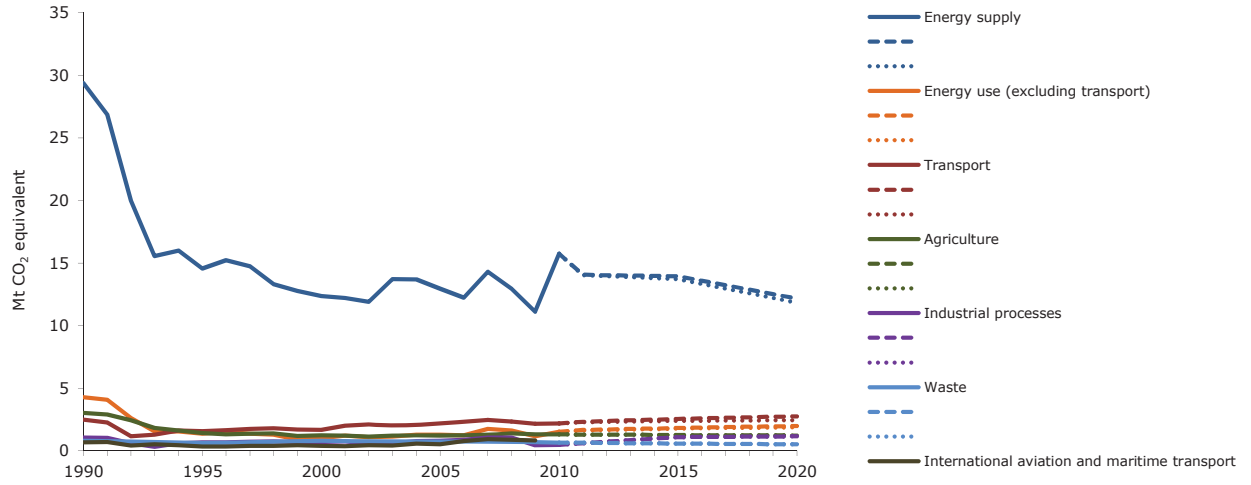
(8) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

(9) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

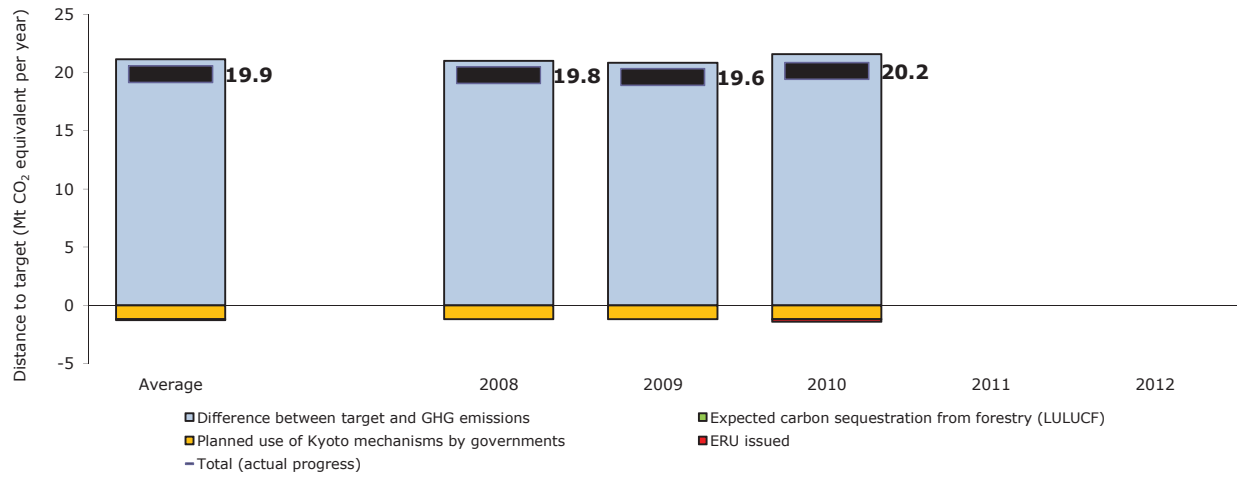


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Estonia were 55.3 % lower than the base-year level, well below the Kyoto target of -8 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly lower than their respective target, by an amount equivalent to 49.6 % the country's base-year emissions. Estonia intends to use the flexible mechanisms at government level by selling an amount of Kyoto units equivalent to 2.8 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Estonia were standing below their target level, by a gap representing 46.6 % of the base-year emissions. Estonia was therefore on track towards its Kyoto target by the end of 2010.



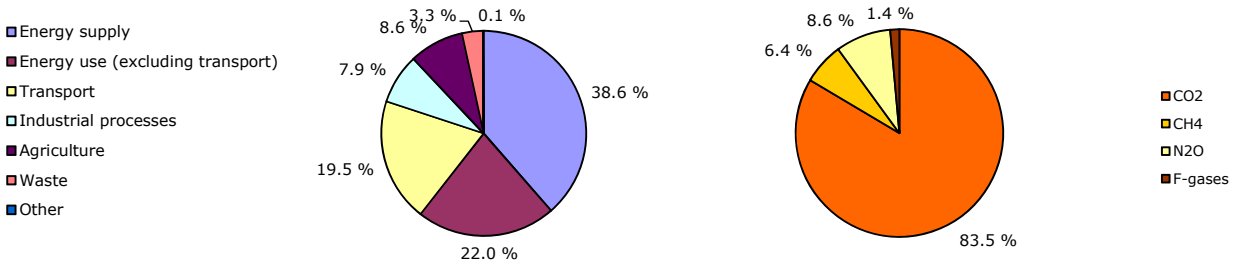
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Finland

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	70.4	70.4	66.3	74.4	Mt CO_2-eq.	15	11
GHG from international bunkers ([4])	2.9	3.1	2.4	n.a.	Mt CO_2-eq.	14	13
GHG per capita	14.1	13.3	12.5	13.9	t CO_2-eq. / capita	5	3
GHG per GDP (constant prices) ([5])	653	422	433	471	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	1.3 %	1.4 %	1.4 %	1.6 %	%		
EU ETS verified emissions - all installations ([6])		36.2	34.3	41.3	Mt CO_2-eq.	12	9
EU ETS verified emissions - constant scope ([7])		36.1	34.2	40.4	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		51.4 %	51.7 %	55.5 %	%		
ETS verified emissions compared to annual allowances ([8])		– 1.0 %	– 7.5 %	8.9 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 4.0	– 5.7 %	– 4.1	– 5.8 %	4.1	5.8 %	8.1	12.2 %
GHG per capita	– 1.7	– 12.0 %	– 0.8	– 6.3 %	– 0.2	– 1.7 %	1.5	11.7 %
EU ETS verified emissions - all installations ([6])			– 1.9	– 5.2 %			7.0	20.4 %
EU ETS verified emissions - constant scope ([7])			– 1.9	– 5.3 %			– 1.9	– 5.3 %

Assessment of long-term GHG trend (1990–2009)

The fluctuations of total emissions over the period are mostly due to the important variations of energy-related CO2 emissions, depending on the economic trend, the energy supply structure, electricity trade and climate conditions. Emissions from industrial processes have increased since 1993, but decreased in 2009 due to the economic downturn. In the early 1990s, several plants were closed down due to an earlier economic recession. Emissions in the agriculture and waste sectors have decreased since 1990. The decrease can largely be attributed to changes in waste legislation, in particular the implementation of the Landfill Directive (1999/31/EC), and changes in agricultural policy and farming subsidies.

Assessment of short-term GHG trend (2008–2009)

The contraction in industrial output due to the economic downturn cut energy consumption in 2009, mainly in energy-dominated manufacturing sectors, the forest industry and manufacture of basic metals. The economic recession also resulted in a considerable decrease of road transport emissions. Furthermore emissions from nitric acid production declined considerably due to the implementation a new N2O abatement technology. These emission decreases were partly offset by emission increases from public electricity and heat production due to the scarcity of hydropower and due to increased use of coal. Lower prices of emission allowances compared with the previous year encouraged the use of coal in electricity and heat production instead of fuels with lower emission rates. The weather was also colder than in the year before, and this heightened the need for heating. On the other hand, the relatively colder weather compared to 2008 increased heating needs. The scarcity of hydropower and increased use of coal, encouraged by lower prices of carbon allowances compared with the previous year, resulted in emission increases from public electricity and heat production.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on EEA estimate of 2010 emissions.

([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

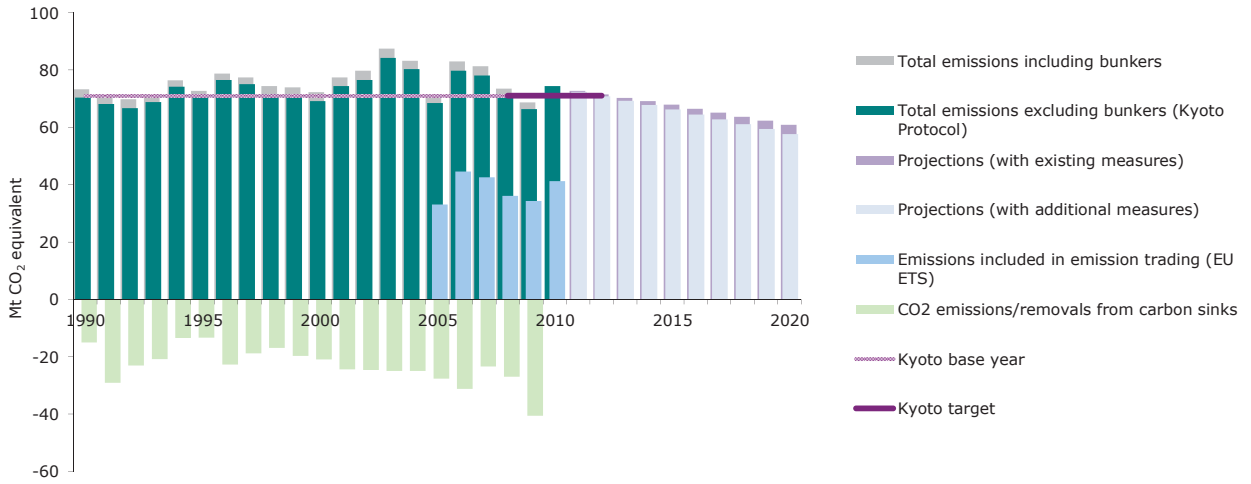
([6]) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

([7]) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

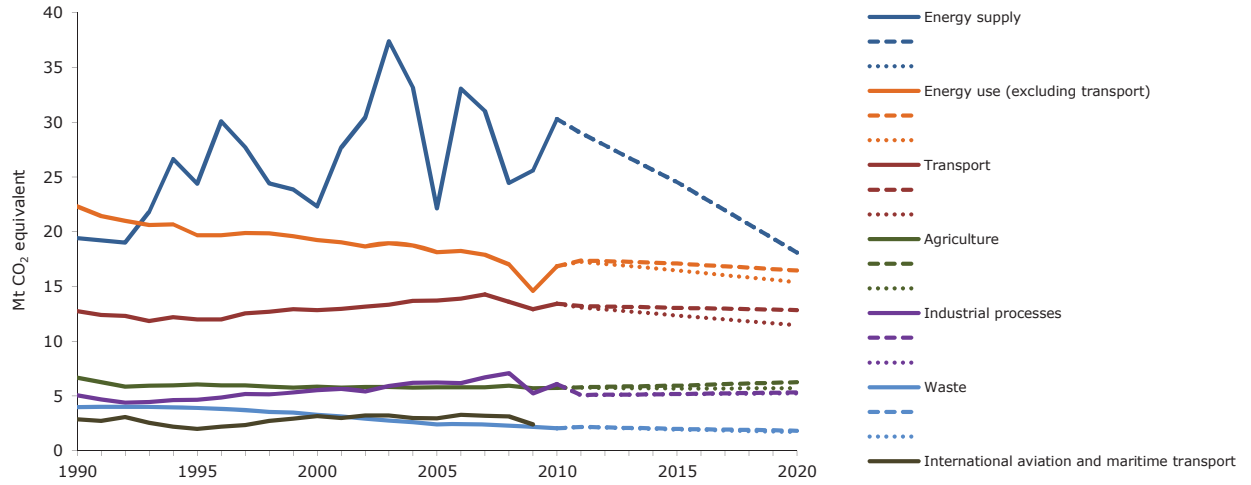
([8]) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

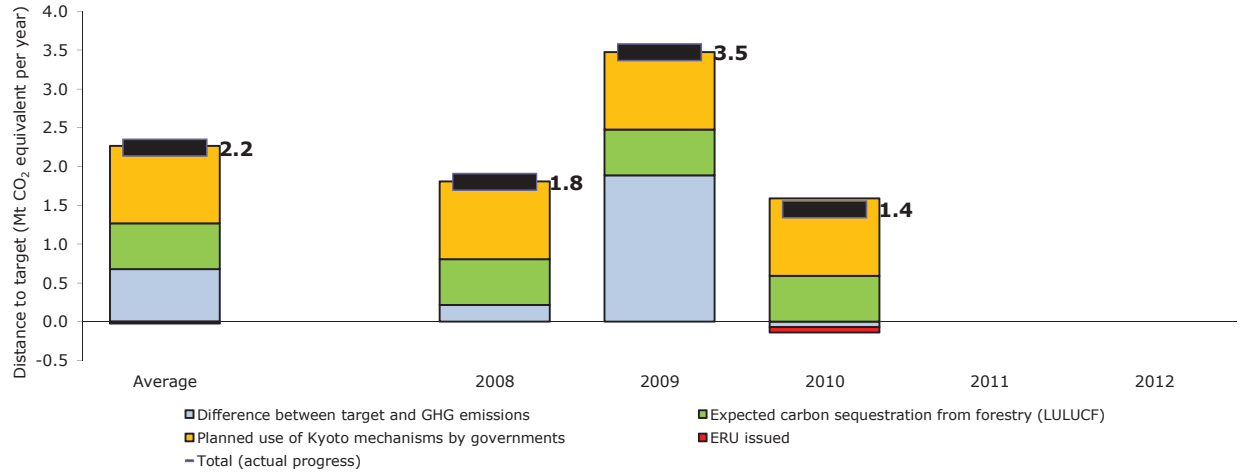


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Finland were 0.8 % lower than the base-year level, below the burden-sharing target of 0 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were lower than their respective target, by an amount equivalent to 1 % the country's base-year emissions. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 0.8 % of base-year level emissions. Finland intends to use the flexible mechanisms at government level by acquiring an amount of Kyoto units equivalent to 1.4 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Finland were standing below their target level, by a gap representing 3.2 % of the base-year emissions. Finland was therefore on track towards its burden-sharing target by the end of 2010.



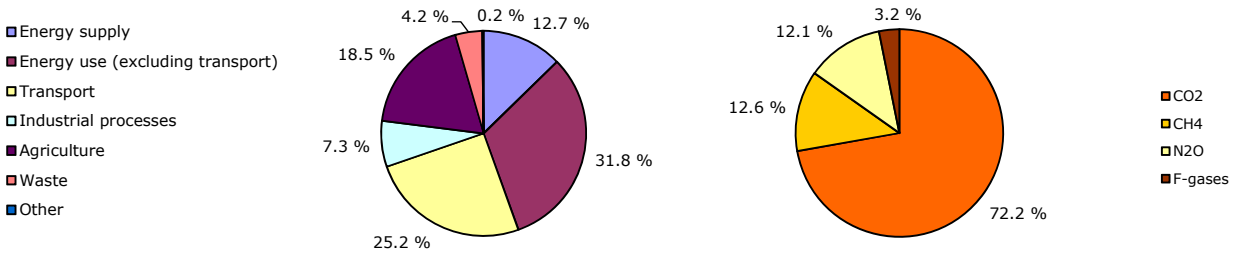
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in France

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	562.9	539.2	517.2	524.6	Mt CO_2-eq.	3	3
GHG from international bunkers ([4])	16.6	25.6	23.9	n.a.	Mt CO_2-eq.	6	6
GHG per capita	9.7	8.4	8.0	8.1	t CO_2-eq. / capita	17	12
GHG per GDP (constant prices) ([5])	475	328	324	323	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	10.1 %	10.9 %	11.2 %	11.1 %	%		
EU ETS verified emissions - all installations ([6])		124.1	111.1	114.7	Mt CO_2-eq.	6	5
EU ETS verified emissions - constant scope ([7])		124.0	110.3	112.7	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		23.0 %	21.5 %	21.9 %	%		
ETS verified emissions compared to annual allowances ([8])		– 7.6 %	– 16.7 %	– 11.9 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 45.6	– 8.1 %	– 21.9	– 4.1 %	– 38.3	– 6.8 %	7.4	1.4 %
GHG per capita	– 1.7	– 17.1 %	– 0.4	– 4.6 %	– 1.6	– 16.4 %	0.1	0.9 %
EU ETS verified emissions - all installations ([6])			– 13.0	– 10.5 %			3.6	3.2 %
EU ETS verified emissions - constant scope ([7])			– 13.7	– 11.1 %			– 13.7	– 11.1 %

Assessment of long-term GHG trend (1990–2009)

Emissions remained relatively stable in the 1990s and have been slightly decreasing since 1998. Key emission trends include a steady increase in emissions from road transport since 1990 (although these emissions have been decreasing since 2004), and in halocarbons consumption (refrigeration and air conditioning), a considerable reduction in N2O emissions due to reduction measures in adipic acid production and a fall in CH4 emissions as a combined result of increased productivity in the dairy sector, the decline in coal mining, and biogas recovery from landfill sites.

Assessment of short-term GHG trend (2008–2009)

France shows a rather low emission reduction compared to other countries in Europe (– 4 %). The largest decrease occurred in fuel-related emissions from public electricity and heat production and manufacturing industries (especially iron and steel). Reductions were also observed in process-related emissions from mineral and metal production. In the households and services sectors, the observed decrease in emissions reflects partly a warmer winter compared to 2008. Emissions from waste continued to increase. The small increase in renewables partly contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on EEA estimate of 2010 emissions.

([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

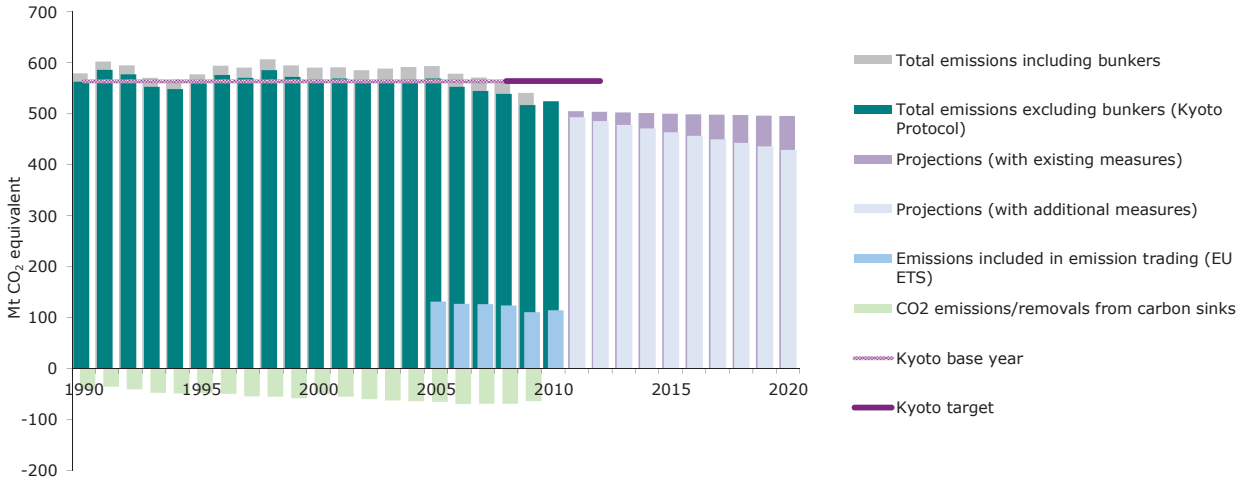
([6]) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

([7]) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

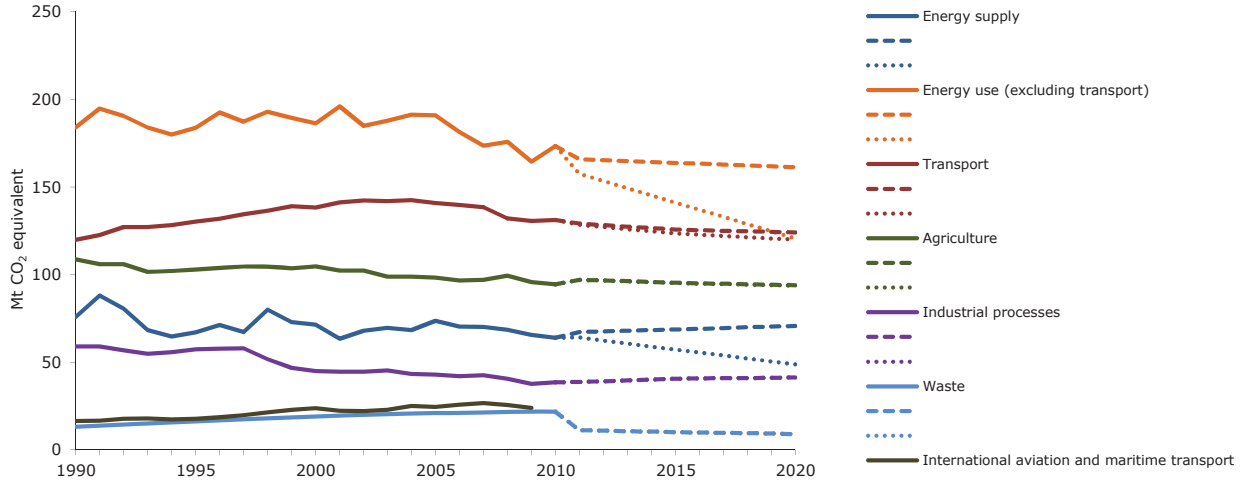
([8]) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

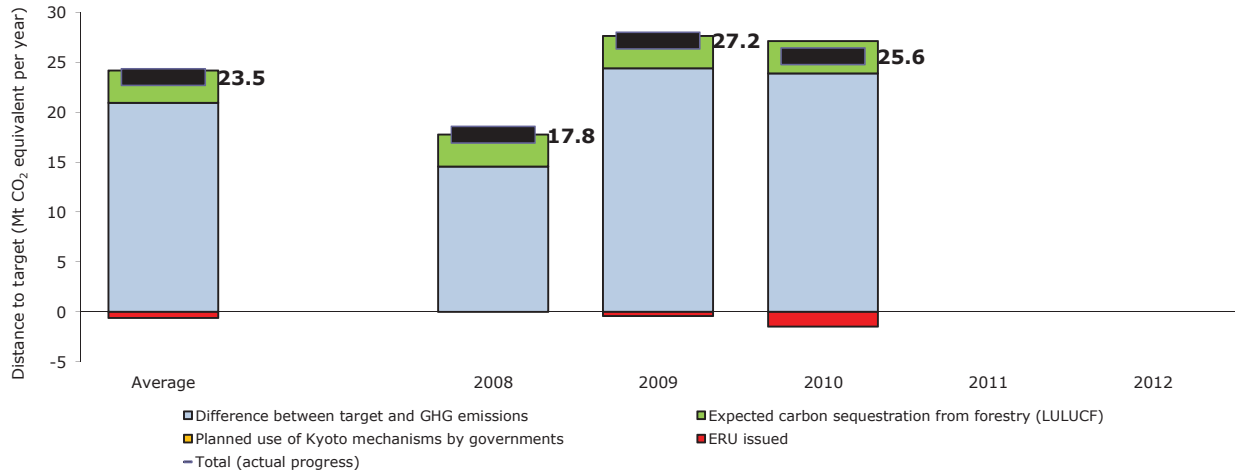


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in France were 6.5 % lower than the base-year level, well below the burden-sharing target of 0 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were lower than their respective target, by an amount equivalent to 3.7 % the country's base-year emissions. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 0.6 % of base-year level emissions. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in France were standing below their target level, by a gap representing 4.2 % of the base-year emissions. France was therefore on track towards its burden-sharing target by the end of 2010.



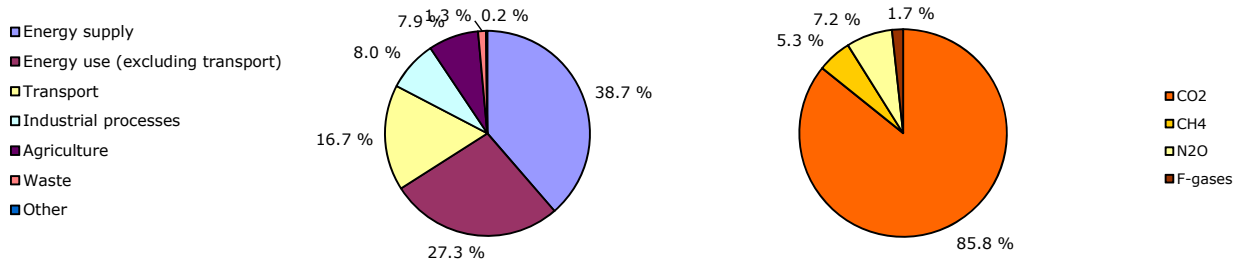
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Germany

European Environment Agency

Key GHG data (1)	1990	2008	2009	2010 (2)	Unit	Rank in EU-27 (3)	Rank in EU-15 (3)
Total greenhouse gas emissions (GHG)	1 247.9	981.1	919.7	960.1	Mt CO_2-eq.	1	1
GHG from international bunkers (4)	20.1	35.5	34.0	n.a.	Mt CO_2-eq.	4	4
GHG per capita	15.8	11.9	11.2	11.7	t CO_2-eq. / capita	9	6
GHG per GDP (constant prices) (5)	683	431	424	427	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	22.3 %	19.7 %	19.9 %	20.3 %	%		
EU ETS verified emissions - all installations (6)		472.7	428.2	454.7	Mt CO_2-eq.	1	1
EU ETS verified emissions - constant scope (7)		472.3	428.1	454.1	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		48.2 %	46.6 %	47.4 %	%		
ETS verified emissions compared to annual allowances (8)		7.9 %	– 1.1 %	3.0 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 (1) (9)



Key GHG trends	1990–2009		2008–2009		1990–2010 (2)		2009–2010 (2)	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 328.2	– 26.3 %	– 61.4	– 6.3 %	– 287.8	– 23.1 %	40.4	4.4 %
GHG per capita	– 4.6	– 28.9 %	– 0.7	– 6.0 %	– 4.0	– 25.6 %	0.5	4.6 %
EU ETS verified emissions - all installations (6)			– 44.5	– 9.4 %			26.5	6.2 %
EU ETS verified emissions - constant scope (7)			– 44.2	– 9.4 %			– 44.2	– 9.4 %

Assessment of long-term GHG trend (1990–2009)

Total emissions have been steadily decreasing since 1990. Energy-related emissions decreased by 25 %, which is due to fuel switching, increased energy and technical efficiency and the increased use of emission-free energy sources. In the early 1990s, the economic restructuring and efficiency improvements reflecting the restructuring after the German reunification led to strong emission declines. Remarkably, emissions from road transport have been decreasing since 1999. Emissions from industrial processes closely reflect production intensities (e.g. production of iron and steel, chemical industry, cement industry), but also the implementation of abatement measures (e.g. adipic acid production). The decrease in agricultural emissions is mainly caused by reduced livestock, fewer emissions from agricultural soils and less fertilizer use. The waste sector shows the highest reduction due to increased recycling and the ban concerning the disposal of biodegradable waste on landfills.

Assessment of short-term GHG trend (2008–2009)

Emissions decreased mainly in the production of public electricity and heat, in industry (in particular iron and steel production) and the households and services sectors. Power production in thermal power plants declined considerably, mainly reflecting decreasing final electricity demand. A 30 % drop steel production resulted in a drop of industrial emissions. Despite of a colder winter compared to 2008, the important reduction in liquid fuel consumption (based on fuel sales) resulted in a decrease of emissions from households and services. This suggests a reduced refuelling of tanks in 2009. In addition, the lower consumption of liquid fuels might have been compensated by the increased consumption of low-carbon or renewable energy sources (such as gas, district heat, biomass and solar heat).

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

(2) Based on national estimate of 2010 emissions.

(3) Comparison of 2009 values, 1 = highest value among EU countries.

(4) International bunkers: international aviation and international maritime transport.

(5) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

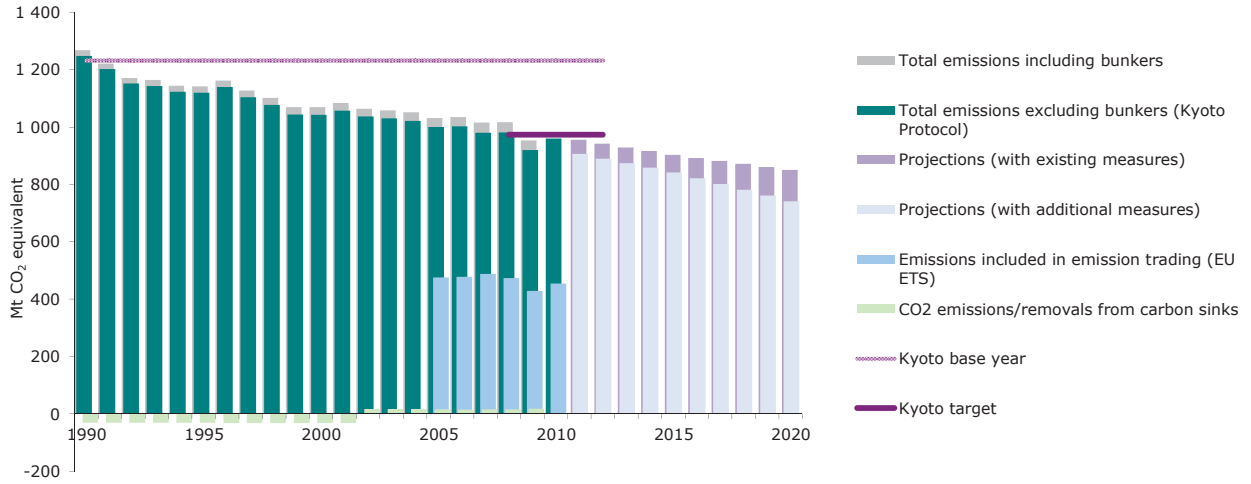
(6) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

(7) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

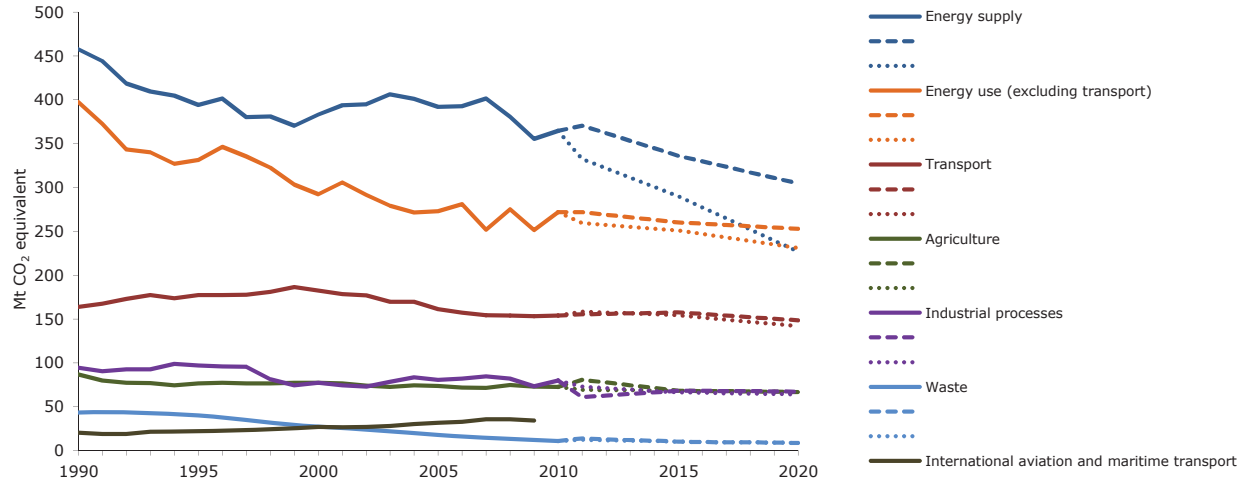
(8) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

(9) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

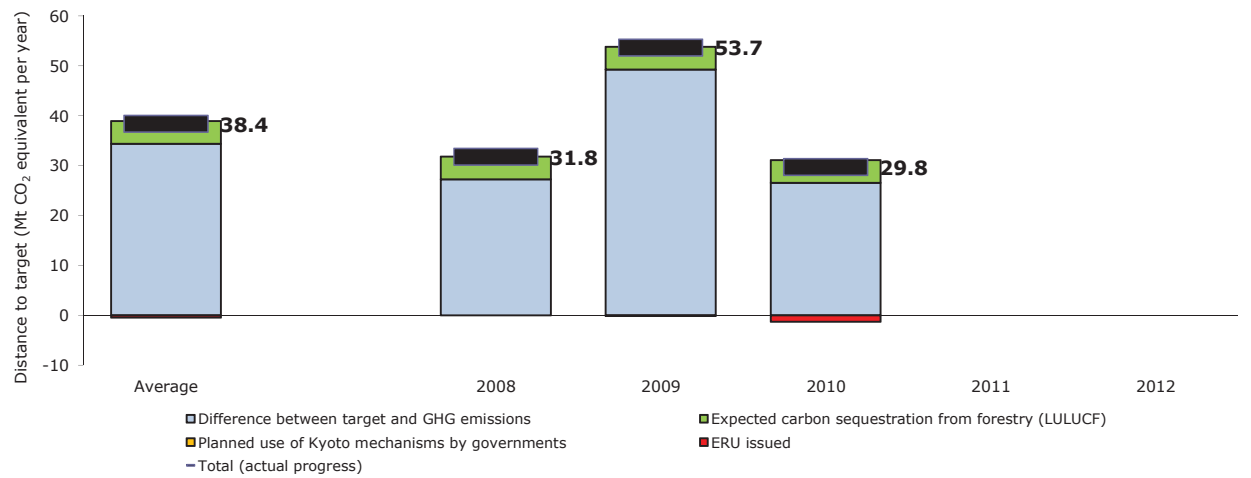


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Germany were 22.6 % lower than the base-year level, below the burden-sharing target of -21 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were lower than their respective target, by an amount equivalent to 2.8 % the country's base-year emissions. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 0.4 % of base-year level emissions. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Germany were standing below their target level, by a gap representing 3.1 % of the base-year emissions. Germany was therefore on track towards its burden-sharing target by the end of 2010.



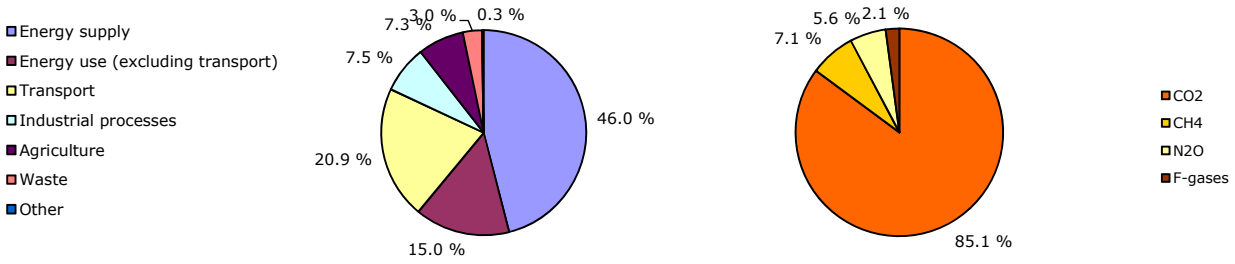
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Greece

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	104.4	128.6	122.5	120.3	Mt CO_2-eq.	11	8
GHG from international bunkers ([4])	10.6	12.9	11.0	n.a.	Mt CO_2-eq.	8	8
GHG per capita	10.3	11.5	10.9	10.6	t CO_2-eq. / capita	11	8
GHG per GDP (constant prices) ([5])	954	690	672	690	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	1.9 %	2.6 %	2.7 %	2.5 %	%		
EU ETS verified emissions - all installations ([6])		69.9	63.7	59.9	Mt CO_2-eq.	9	7
EU ETS verified emissions - constant scope ([7])		69.9	63.6	59.9	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		54.3 %	52.0 %	49.8 %	%		
ETS verified emissions compared to annual allowances ([8])		9.7 %	0.7 %	– 7.3 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	18.2	17.4 %	– 6.0	– 4.7 %	16.0	15.3 %	– 2.2	– 1.8 %
GHG per capita	0.6	5.5 %	– 0.6	– 5.1 %	0.3	3.2 %	– 0.2	– 2.2 %
EU ETS verified emissions - all installations ([6])			– 6.2	– 8.9 %			– 3.7	– 5.8 %
EU ETS verified emissions - constant scope ([7])			– 6.2	– 8.9 %			– 6.2	– 8.9 %

Assessment of long-term GHG trend (1990–2009)

Emissions have overall increased since 1990 (+ 17 %), although they have been levelling off since 2005. The improvement of living standards, due to the economic development during the period 1990–2007, the significant growth of the services sector and the introduction of natural gas in the Greek energy system represent the basic factors explaining energy-related emission trends. The substantial increase of GHG emissions from road transport (+ 78 %) is directly linked to the increase of vehicles fleet but also to the increase of transport activity. Emissions from industrial processes increased until 1999, stabilised over the period 2000–2005 and decreased sharply afterwards. The intense fluctuation of these emissions is mainly due to the cease of HCFC-22 production. Emissions reduction from agricultural sector is mainly due to the reduction of N2O emissions from agricultural soils, because of the reduction in the use of synthetic nitrogen fertilizers.

Assessment of short-term GHG trend (2008–2009)

The reduction of emissions in public electricity and heat production reflects a marked decline in thermal power production, mainly due to a 3.4 % reduction in final electricity consumption and an increase in electricity generation from hydropower. Other main emission decreases occurred in manufacturing industries and construction, as well as in process-related emissions in the cement industry. Also emission from household and services decreased. The increase in renewables also contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on EEA estimate of 2010 emissions.

([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

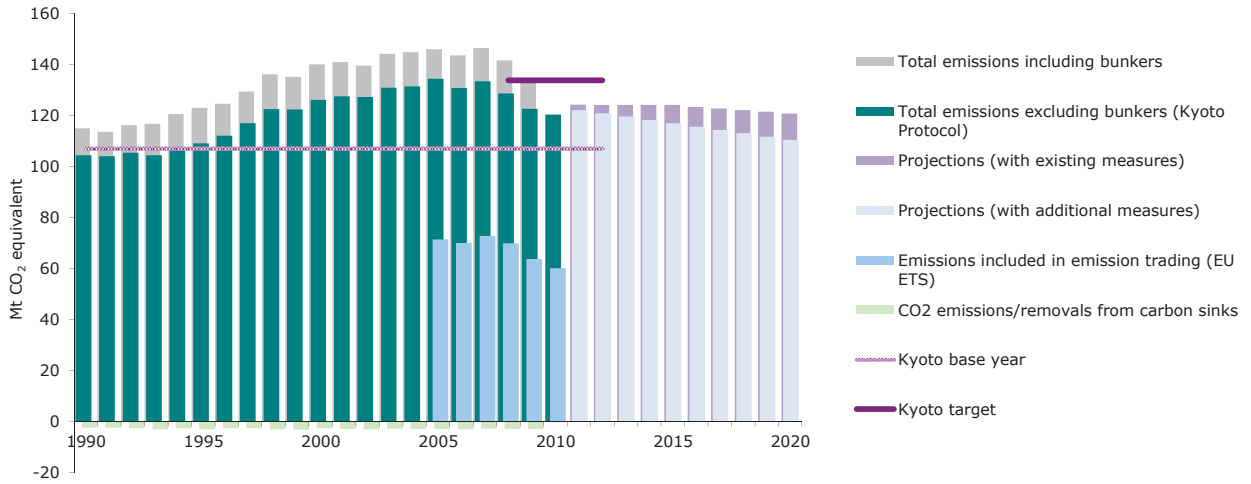
([6]) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

([7]) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

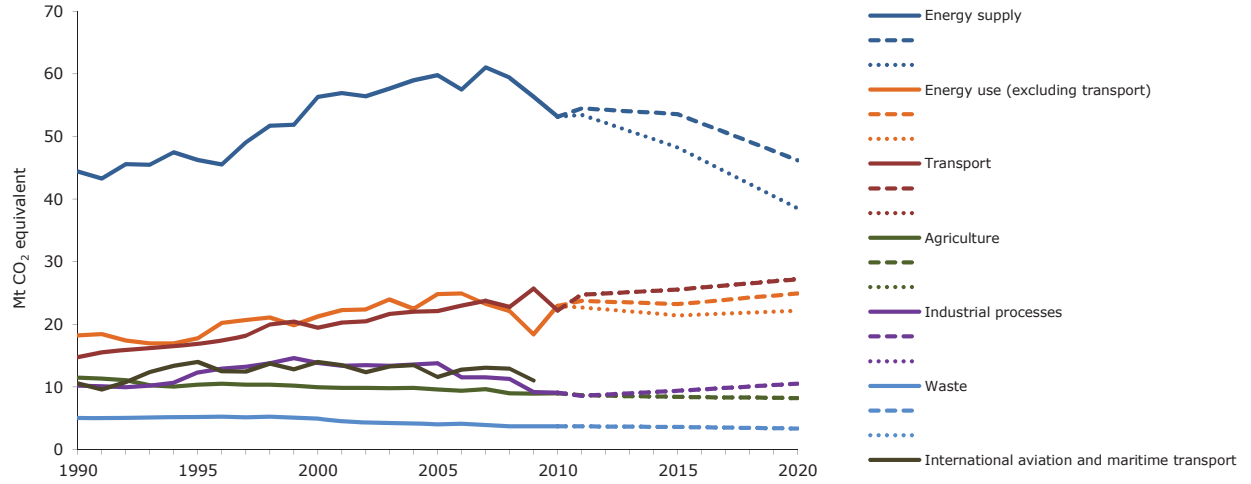
([8]) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

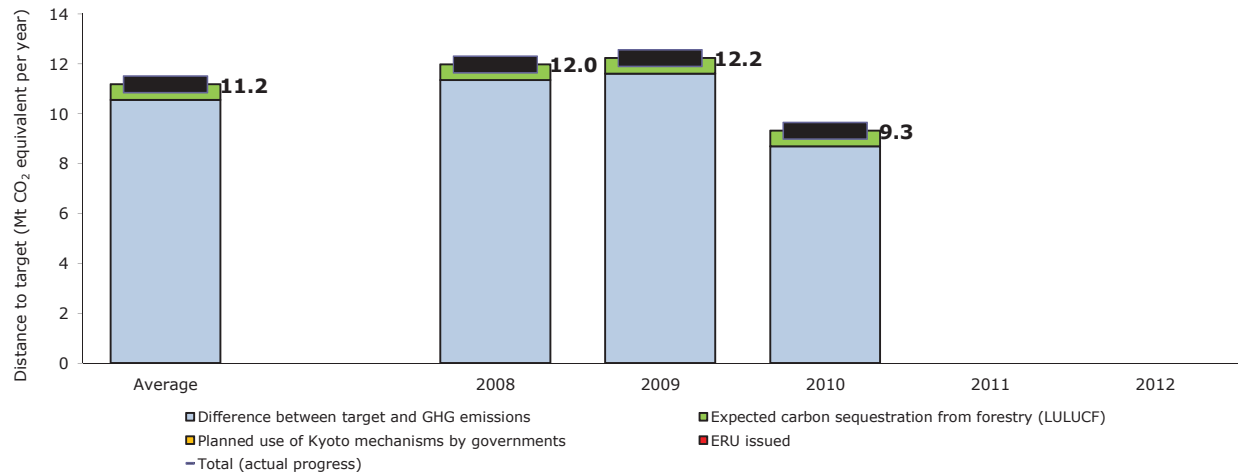


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Greece were 15.7 % higher than the base-year level, well below the burden-sharing target of 25 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly lower than their respective target, by an amount equivalent to 9.9 % the country's base-year emissions. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 0.6 % of base-year level emissions. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Greece were standing below their target level, by a gap representing 10.5 % of the base-year emissions. Greece was therefore on track towards its burden-sharing target by the end of 2010.



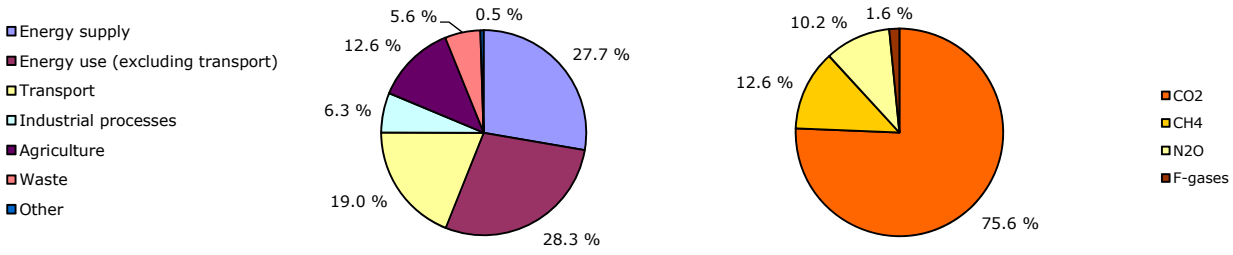
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Hungary

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	96.8	73.1	66.7	67.7	Mt CO_2-eq.	14	n.a.
GHG from international bunkers ([4])	0.5	0.8	0.7	n.a.	Mt CO_2-eq.	24	n.a.
GHG per capita	9.3	7.3	6.7	6.8	t CO_2-eq. / capita	23	n.a.
GHG per GDP (constant prices) ([5])	2 109	1 114	1 090	1 093	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	1.7 %	1.5 %	1.4 %	1.4 %	%		
EU ETS verified emissions - all installations ([6])		27.2	22.4	23.0	Mt CO_2-eq.	17	n.a.
EU ETS verified emissions - constant scope ([7])		27.2	22.4	22.9	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		37.3 %	33.6 %	34.0 %	%		
ETS verified emissions compared to annual allowances ([8])		8.4 %	– 6.3 %	– 10.5 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 30.1	– 31.1 %	– 6.4	– 8.7 %	– 29.1	– 30.1 %	1.0	1.4 %
GHG per capita	– 2.7	– 28.7 %	– 0.6	– 8.6 %	– 2.6	– 27.6 %	0.1	1.6 %
EU ETS verified emissions - all installations ([6])			– 4.8	– 17.8 %			0.6	2.7 %
EU ETS verified emissions - constant scope ([7])			– 4.9	– 17.8 %			– 4.9	– 17.8 %

Assessment of long-term GHG trend (1990–2009)

Large emission reductions occurred particularly in the early 1990s, due to reduced energy demand in the years of economic transformation and changes in the fuel structure with the replacement of solid fuel by natural gas. Transport emissions increased steadily between 1994 and 2008; however, they decreased for the first time in 2009 by 2 %. Total emissions from agriculture decreased significantly over the period 1985–1995. The bulk of this decrease occurred between 1985 and 1995, when agricultural production underwent a drastic decrease. Emission reductions were also observed in industrial processes, in particular for the mineral and the chemical industries. The growth in emissions from waste has shown signs of stabilisation in recent years.

Assessment of short-term GHG trend (2008–2009)

Emissions decreased in all major sectors. The highest relative reduction (– 17.2 %) occurred in the industrial processes sector mainly due to lower production volumes especially in mineral production (– 28.9 %). The reduction in fuel combustion contributed towards a reduction of 4.9 Mt of the total 6.4 Mt reduction. Although less favourable weather conditions raised energy demand in the heating season, the fall in the production of energy-intensive sectors led to an overall decline in energy use, supported also by an increasing share of nuclear and renewable energy in electricity and heat production. The increase in renewables also contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on EEA estimate of 2010 emissions.

([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

([6]) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

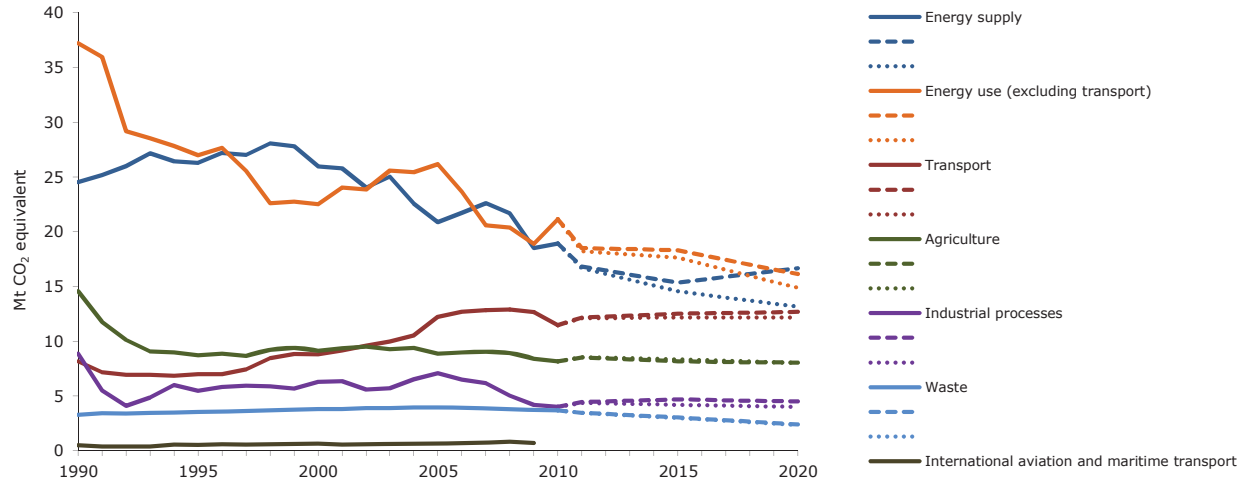
([7]) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

([8]) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions

GHG trends and projections 1990–2020 — emissions by sector

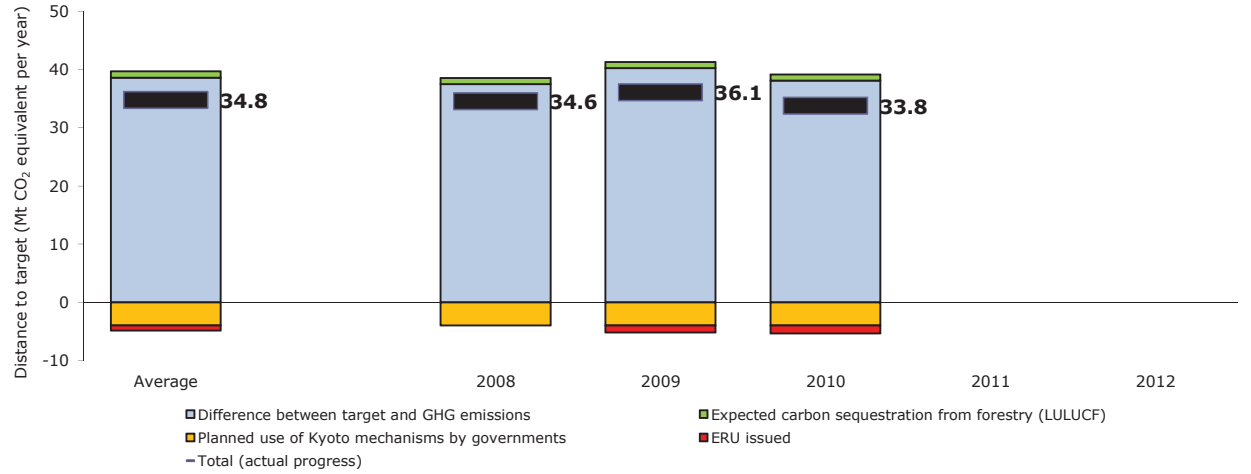


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Hungary were 40.1 % lower than the base-year level, well below the Kyoto target of -6 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly lower than their respective target, by an amount equivalent to 33.5 % the country's base-year emissions. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 0.9 % of base-year level emissions. Hungary intends to use the flexible mechanisms at government level by selling an amount of Kyoto units equivalent to 3.5 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Hungary were standing below their target level, by a gap representing 30.2 % of the base-year emissions. Hungary was therefore on track towards its Kyoto target by the end of 2010.



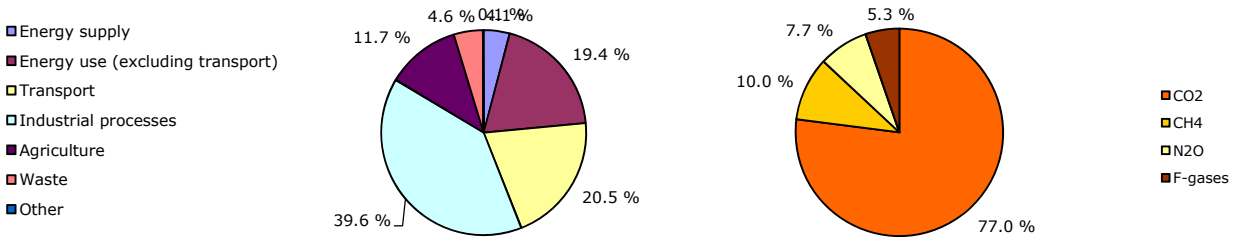
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Iceland

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	3.4	4.9	4.6	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG from international bunkers ([4])	0.3	0.7	0.5	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG per capita	13.5	15.5	14.5	n.a.	t CO_2-eq. / capita	n.a.	n.a.
GHG per GDP (constant prices) ([5])	466	374	380	0	g CO_2-eq. / euro		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	1.2	35.2 %	– 0.3	– 5.4 %	n.a.	n.a.	n.a.	n.a.
GHG per capita	1.0	7.5 %	– 1.0	– 6.5 %	n.a.	n.a.	n.a.	n.a.

Assessment of long-term GHG trend (1990–2009)

Around 80 % of Iceland's energy — and almost all stationary energy — come from renewable resources, hydro and geothermal. This means that Iceland has few possibilities to reduce greenhouse emissions from the production of electricity and space heating, as Iceland had already almost abolished the use of fossil fuels for these purposes in 1990. The main driver behind increased emissions since 1990 has been the expansion of the metal production sector. In 1990, 88 thousand tonnes (Kt) of aluminium were produced in one aluminium plant in Iceland, whereas 817 Kt were produced in 2009 by three aluminium plants. Parallel investments in increased power capacity were needed to accommodate for a nine-fold increase in aluminium production. The size of these investments is large relative to the Icelandic economy. While they were relatively stable over the period 1999–2005, emissions have dramatically increased between 2005 and 2008, almost exclusively driven by the expansion of heavy industry in Iceland, mainly in the field of aluminium production. Iceland was severely hit by an economic crisis, which resulted in decreases in greenhouse gas emissions from most sectors. Since 1990 emission from the transport sector have risen considerably, owing to the fact that a larger share of the population uses private cars for their daily travel. Land-use change (land conversion to cropland and grassland) is also a significant contributor to CO2 emissions. However, increased government funding to afforestation and revegetation is increasing

Assessment of short-term GHG trend (2008–2009)

Late year 2008, Iceland was severely hit by an economic crisis when its three largest banks collapsed. The blow was particularly hard owing to the large size of the banking sector in relation to the overall economy as it had grown to be ten times the annual GDP. The crisis has resulted in serious contraction of the economy followed by increase in unemployment, a depreciation of the Icelandic króna (ISK), and a drastic increase in external debt. Private consumption has contracted by a quarter since 2007. Emissions of greenhouse gases decreased from most sectors between 2008 and 2009. In 2008 and 2009 fuel prices rose significantly leading to lower emissions from the sector compared to the years before. The construction sector collapsed in autumn 2008. Emissions from fuel combustion in the transport and construction sector decreased in 2008 by 5% compared to 2007 and in 2009 by 2% compared to 2008, because of the economic crises.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on EEA estimate of 2010 emissions.

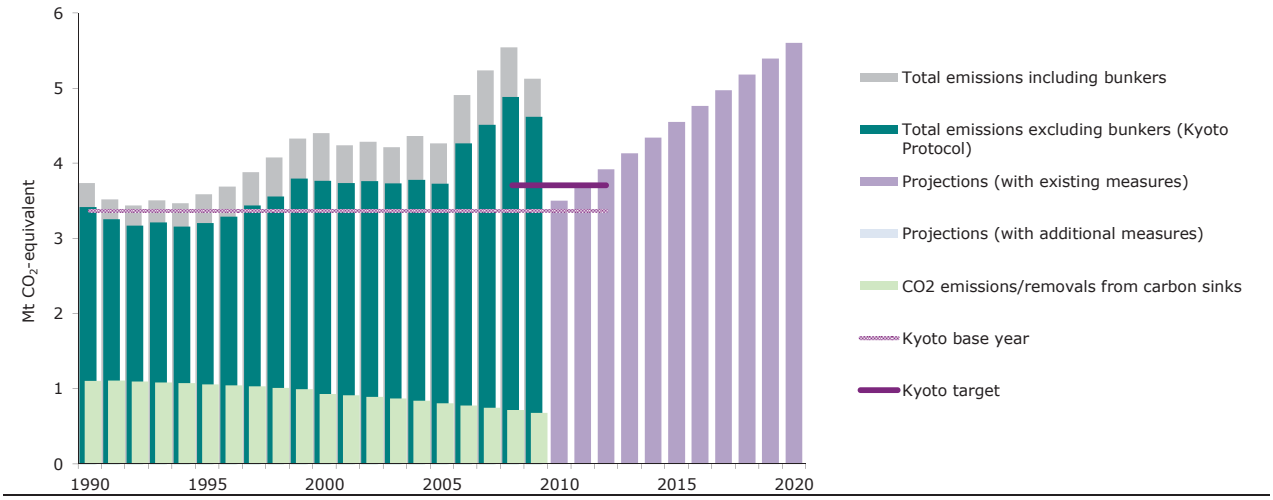
([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

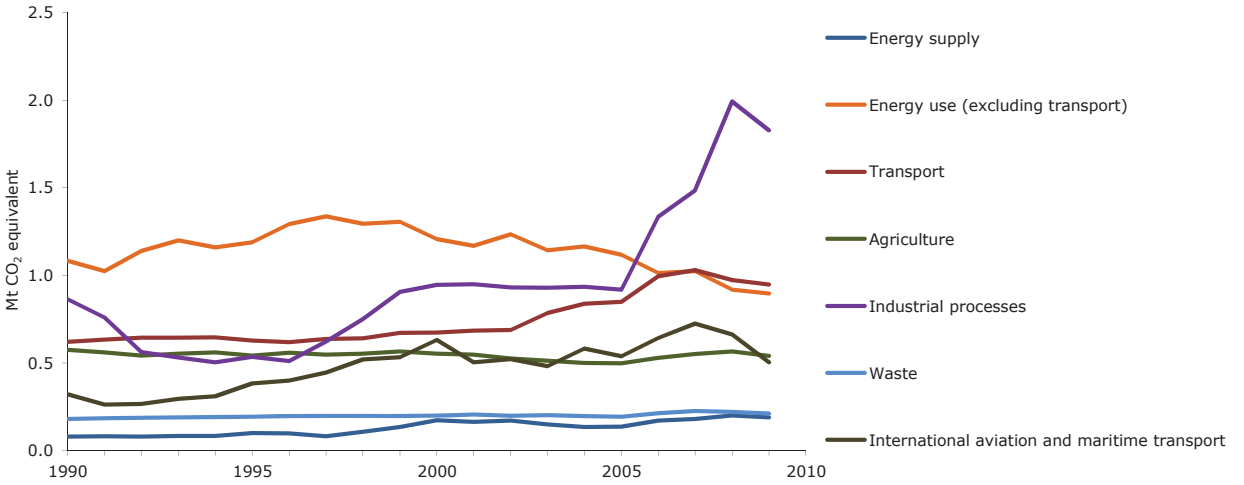
([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



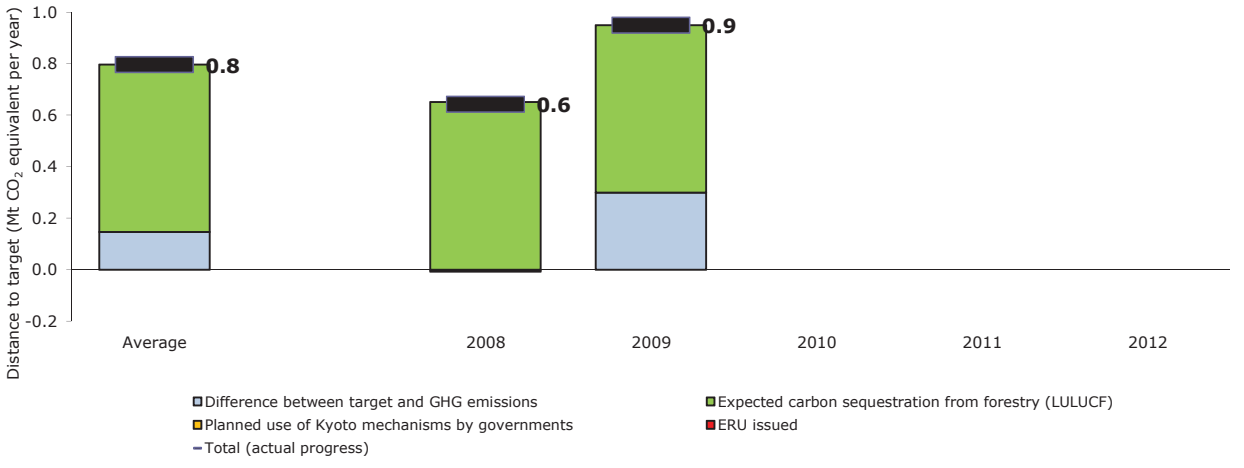
GHG trends 1990–2009 - emissions by sector



Source: National GHG inventory, 2011. See: http://dataservice.eea.europa.eu/PivotApp/pivot.aspx?pivotid=475

Progress towards Kyoto target

Average 2008–2009 emissions in Iceland were 5.7 % higher than the base-year level, below the Kyoto target of 10 % for the period 2008–2012. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 19.3 % of base-year level emissions. Taking all these effects in to account, average emissions Iceland were standing below their target level, by a gap representing 23.7 % of the base-year emissions. Iceland was therefore on track towards its Kyoto target by the end of 2009. These calculations take into account the provisions of COP Decision 14/CP.7, according to which any Annex I Party accounting for less than 0.05 % of all Annex I Parties 1990 emissions (as is the case for Iceland), can exclude from its national total emissions during the commitment period, the emissions from single projects provided that renewable energy is used, resulting in a reduction in GHG emissions per unit of production, and best environmental practice is used to minimize process emissions.



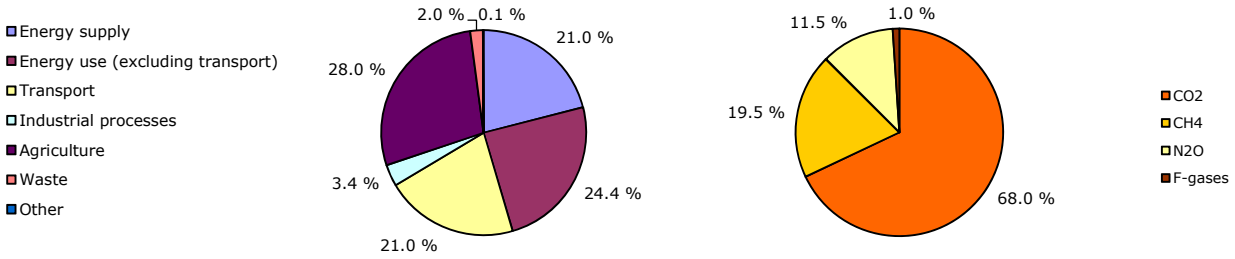
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Ireland

European Environment Agency

Key GHG data (1)	1990	2008	2009	2010 (2)	Unit	Rank in EU-27 (3)	Rank in EU-15 (3)
Total greenhouse gas emissions (GHG)	54.8	67.8	62.4	60.6	Mt CO_2-eq.	16	12
GHG from international bunkers (4)	1.1	3.0	2.5	n.a.	Mt CO_2-eq.	13	12
GHG per capita	15.6	15.4	14.0	13.6	t CO_2-eq. / capita	2	2
GHG per GDP (constant prices) (5)	1 040	462	459	451	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	1.0 %	1.4 %	1.4 %	1.3 %	%		
EU ETS verified emissions - all installations (6)		20.4	17.2	17.4	Mt CO_2-eq.	20	14
EU ETS verified emissions - constant scope (7)		20.4	17.2	16.4	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		30.1 %	27.6 %	28.6 %	%		
ETS verified emissions compared to annual allowances (8)		2.1 %	– 14.5 %	– 18.1 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 (1) (9)



Key GHG trends	1990–2009		2008–2009		1990–2010 (2)		2009–2010 (2)	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	7.6	13.8 %	– 5.4	– 8.0 %	5.8	10.5 %	– 1.8	– 2.9 %
GHG per capita	– 1.6	– 10.3 %	– 1.4	– 9.0 %	– 2.1	– 13.2 %	– 0.5	– 3.3 %
EU ETS verified emissions - all installations (6)			– 3.2	– 15.5 %			0.1	0.8 %
EU ETS verified emissions - constant scope (7)			– 3.2	– 15.7 %			– 3.2	– 15.7 %

Assessment of long-term GHG trend (1990–2009)

The large increase in emissions during the period 1990–2001 was clearly driven by the growth in CO2 emissions from energy use. During the 1994–2001 period, during which Ireland experienced an unprecedented economic growth, energy emissions grew by an average of 4.3 per cent annually. The rate of economic growth slowed down from 2000 to 2004, which together with the closure of ammonia and nitric acid production plants and continued decline in cattle populations and fertilizer use resulted in some reduction in the emission levels in 2002–2004. Emissions increased in 2005 due largely to road transport and electricity generation where two new peat-fired stations entered into service. The recent declining trend between 2005 and 2009 can be largely attributed to decreases in the agriculture and waste sectors and in 2008 to reduced process emissions in the mineral industry. The single largest decrease in emissions occurred in 2009 when emissions decreased by 8.0 per cent due to the economic crisis. In addition, the sustained increase in transport emissions, a major contributor to the trend, came to an end in 2008 and in 2009 decreased to the level pre 2006.

Assessment of short-term GHG trend (2008–2009)

The effects of the economic downturn are mainly evident in the 20 % reduction in emissions from the industry and commercial sector (mainly food processing and cement production) and in reduced power production (– 10 % emission reduction) due to a reduced electricity demand of end-users and an increased share of renewables in gross electricity consumption whilst carbon-intensive fuels in power generation decreased in 2009 relative to 2008. Emissions from road transport have decreased for the second consecutive year (8 % compared to 2008) as a consequence of the economic downturn as well as changes in vehicle registration tax and road tax introduced in mid-2008. The increase in renewables also contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

(2) Based on EEA estimate of 2010 emissions.

(3) Comparison of 2009 values, 1 = highest value among EU countries.

(4) International bunkers: international aviation and international maritime transport.

(5) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

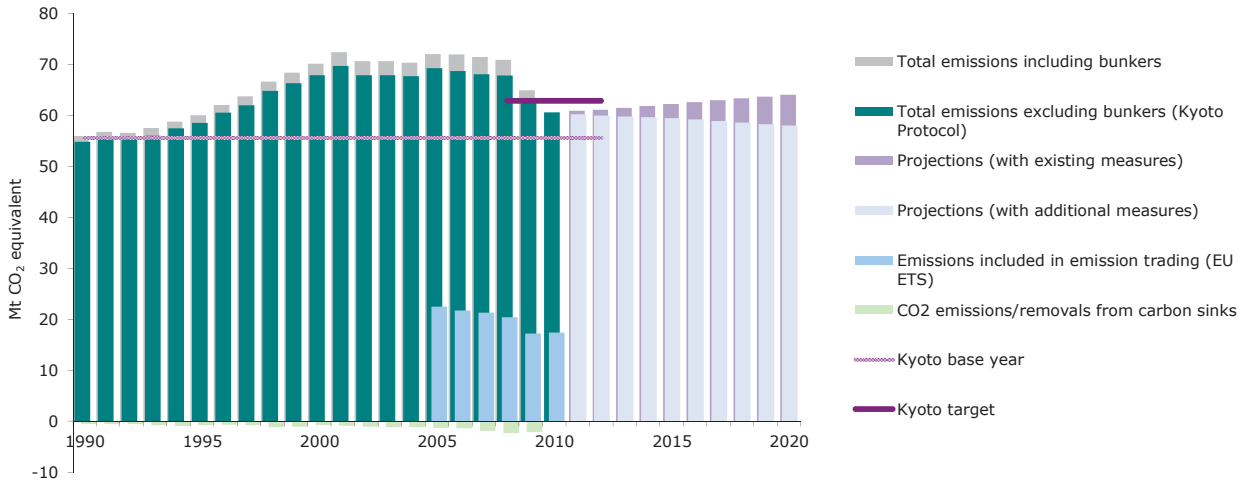
(6) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

(7) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

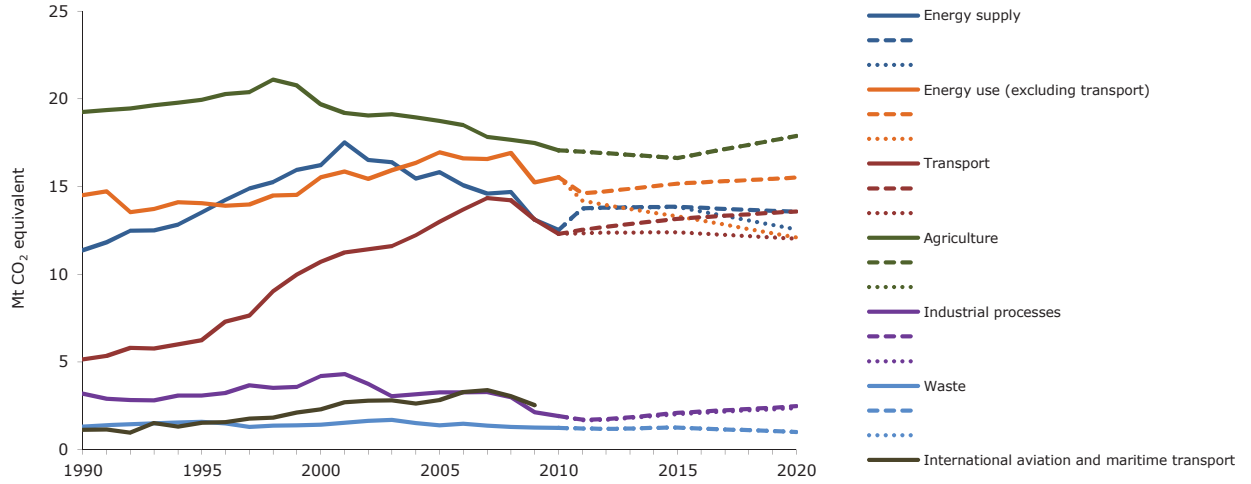
(8) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

(9) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

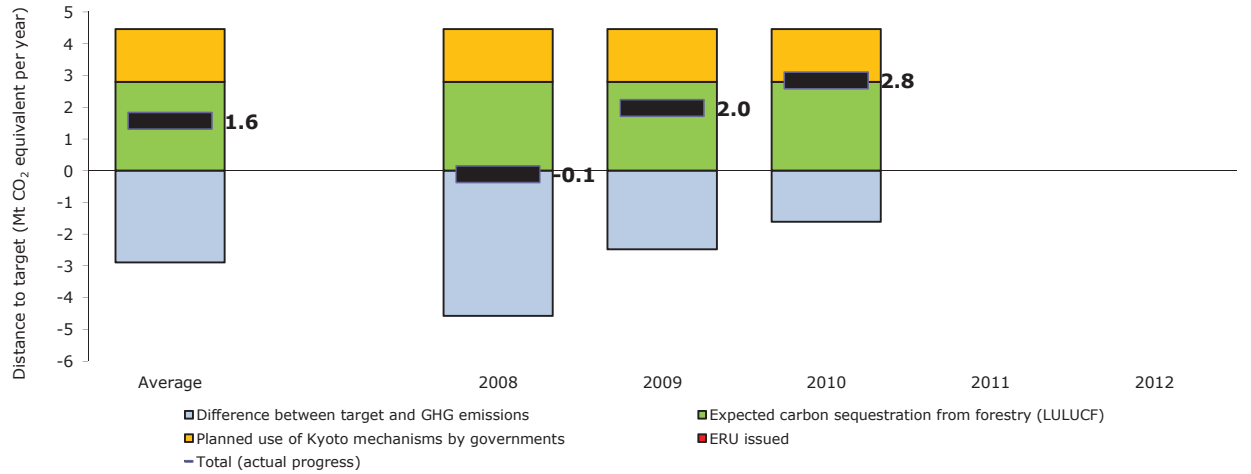


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Ireland were 14.4 % higher than the base-year level, above the burden-sharing target of 13 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly higher than their respective target, by an amount equivalent to 5.2 % the country's base-year emissions. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 5 % of base-year level emissions. Ireland intends to use the flexible mechanisms at government level by acquiring an amount of Kyoto units equivalent to 3 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Ireland were standing below their target level, by a gap representing 2.8 % of the base-year emissions. Ireland was therefore on track towards its burden-sharing target by the end of 2010.



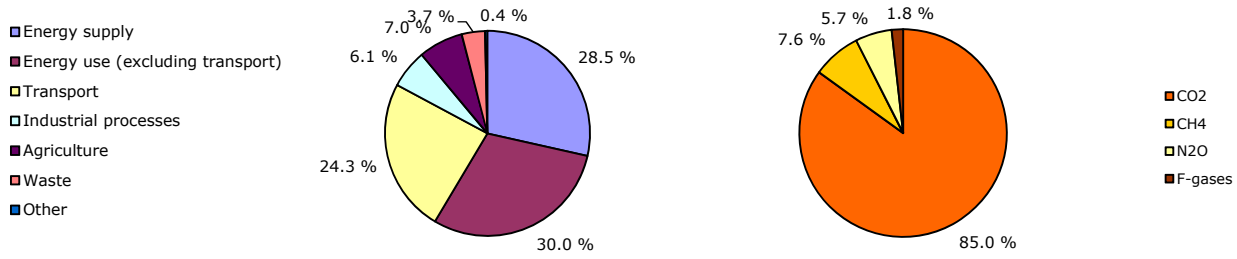
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Italy

European Environment Agency

Key GHG data (1)	1990	2008	2009	2010 (2)	Unit	Rank in EU-27 (3)	Rank in EU-15 (3)
Total greenhouse gas emissions (GHG)	519.2	541.7	491.1	493.6	Mt CO_2-eq.	4	4
GHG from international bunkers (4)	8.6	18.7	16.4	1.0	Mt CO_2-eq.	7	7
GHG per capita	9.2	9.1	8.2	8.2	t CO_2-eq. / capita	16	11
GHG per GDP (constant prices) (5)	510	426	407	404	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	9.3 %	10.9 %	10.6 %	10.4 %	%		
EU ETS verified emissions - all installations (6)		220.7	184.9	191.5	Mt CO_2-eq.	4	3
EU ETS verified emissions - constant scope (7)		220.6	184.5	189.6	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		40.7 %	37.6 %	38.8 %	%		
ETS verified emissions compared to annual allowances (8)		4.0 %	– 11.5 %	– 4.3 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 (1) (9)



Key GHG trends	1990–2009		2008–2009		1990–2010 (2)		2009–2010 (2)	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 28.0	– 5.4 %	– 50.6	– 9.3 %	– 25.6	– 4.9 %	2.5	0.5 %
GHG per capita	– 1.0	– 10.7 %	– 0.9	– 10.0 %	– 1.0	– 10.7 %	0.0	0.0 %
EU ETS verified emissions - all installations (6)			– 35.8	– 16.2 %			6.6	3.6 %
EU ETS verified emissions - constant scope (7)			– 36.1	– 16.4 %			– 36.1	– 16.4 %

Assessment of long-term GHG trend (1990–2009)

After a long period of increasing emissions between 1994 and 2004, emissions have been regularly decreasing since. Energy-related emissions decreased by about 2.8 % from 1990 to 2009. Significant increases were observed in the transport and in the households and services sectors, while emissions from energy industries decreased mainly between 2007 and 2009. The decrease in emissions from industrial processes was attributed to the chemical industry (production of nitric acid and adipic acid) and metal production (pig iron and steel). Emissions from adipic acid productions were significantly reduced through abatement technology. Emissions of fluorinated gases also increased considerably (253 %). In the agricultural sector, reductions were observed in CH4 emissions from enteric fermentation and N2O emissions from agricultural soils. Improved disposal of solid waste on land reduced emissions in the waste sector.

Assessment of short-term GHG trend (2008–2009)

Emissions continued to decrease for the fifth consecutive year. In particular, reductions were observed in emissions from energy industries, iron and steel industry, chemical industry, cement production and road transport. This latter notable decrease was possibly due to the economic recession. Emissions from households and services, on the other hand, increased, partly due to a colder winter. The increase in renewables also contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

(2) Based on national estimate of 2010 emissions.

(3) Comparison of 2009 values, 1 = highest value among EU countries.

(4) International bunkers: international aviation and international maritime transport.

(5) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

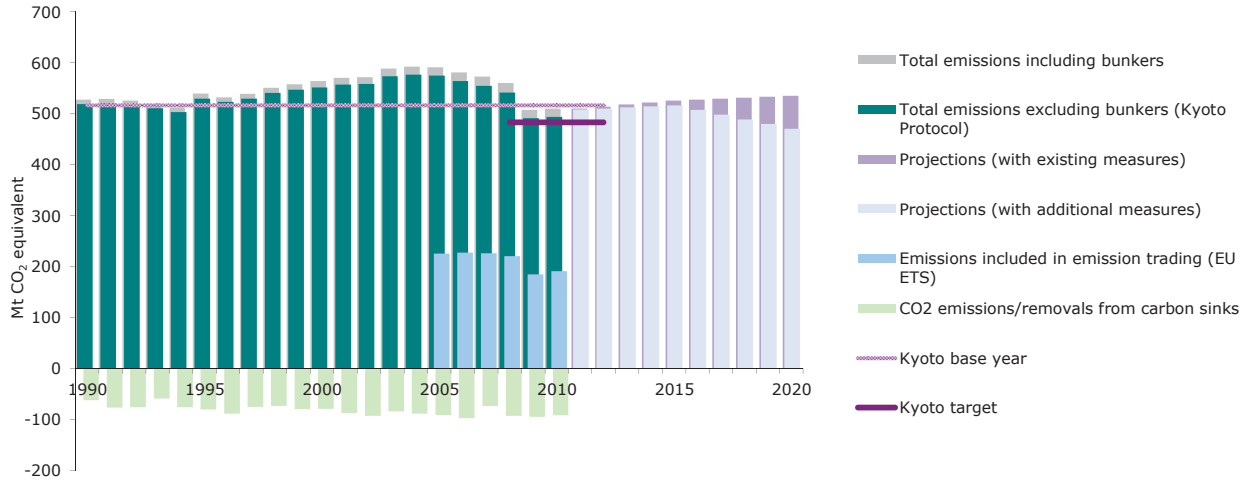
(6) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

(7) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

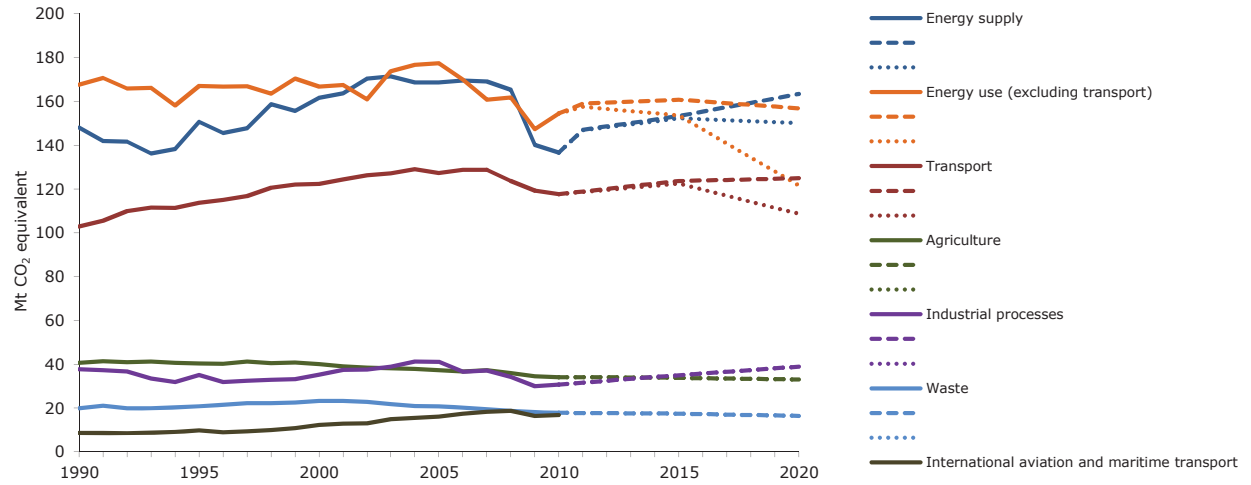
(8) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

(9) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

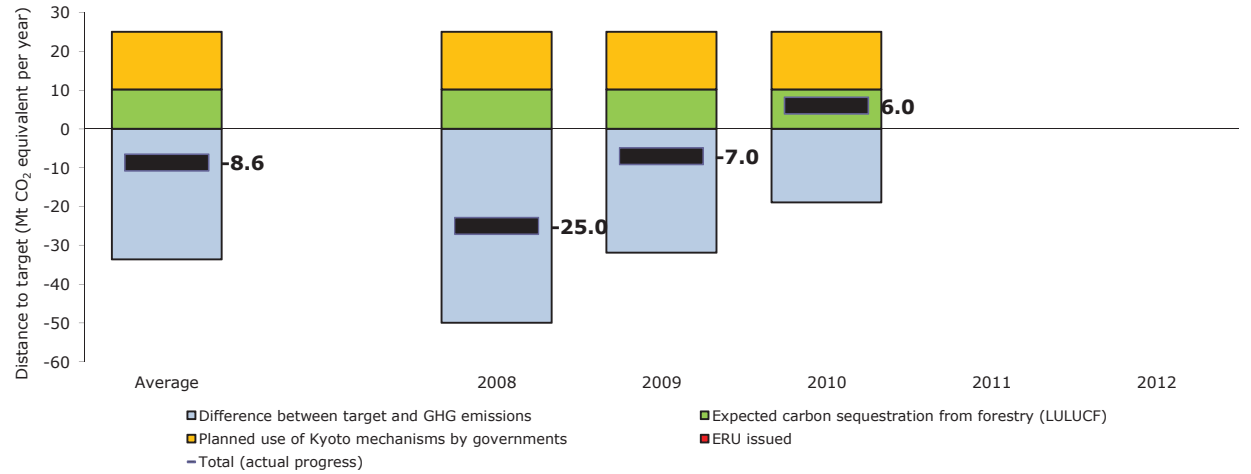


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Italy were 1.6 % lower than the base-year level, above the burden-sharing target of -6.5 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly higher than their respective target, by an amount equivalent to 6.5 % the country's base-year emissions. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 2 % of base-year level emissions. Italy intends to use the flexible mechanisms at government level by acquiring an amount of Kyoto units equivalent to 2.9 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Italy were standing above their target level, by a gap representing 1.7 % of the base-year emissions. Italy was therefore not on track towards its burden-sharing target by the end of 2010.



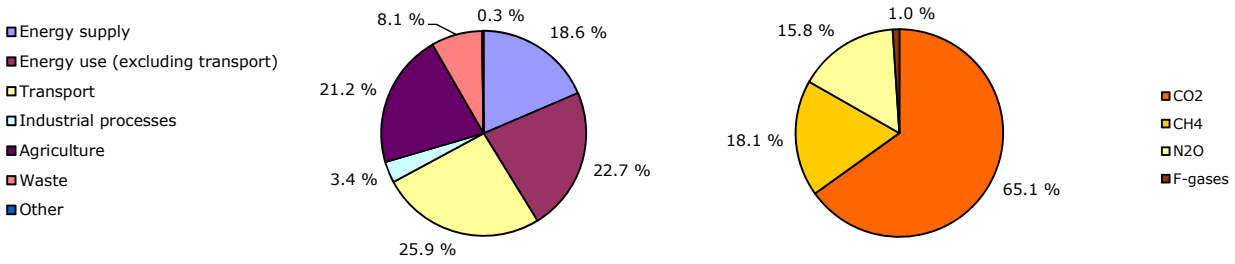
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Latvia

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	26.6	11.9	10.7	11.5	Mt CO_2-eq.	25	n.a.
GHG from international bunkers ([4])	1.8	1.0	1.2	n.a.	Mt CO_2-eq.	18	n.a.
GHG per capita	10.0	5.2	4.7	5.1	t CO_2-eq. / capita	27	n.a.
GHG per GDP (constant prices) ([5])	2 164	801	878	944	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	0.5 %	0.2 %	0.2 %	0.2 %	%		
EU ETS verified emissions - all installations ([6])		2.7	2.5	3.2	Mt CO_2-eq.	25	n.a.
EU ETS verified emissions - constant scope ([7])		2.7	2.3	2.6	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		23.0 %	23.2 %	28.2 %	%		
ETS verified emissions compared to annual allowances ([8])		– 6.7 %	– 29.5 %	– 8.2 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 15.9	– 59.7 %	– 1.2	– 10.0 %	– 15.1	– 56.8 %	0.8	7.1 %
GHG per capita	– 5.2	– 52.4 %	– 0.5	– 9.6 %	– 4.9	– 48.7 %	0.4	7.7 %
EU ETS verified emissions - all installations ([6])			– 0.3	– 9.2 %			0.8	30.1 %
EU ETS verified emissions - constant scope ([7])			– 0.4	– 15.7 %			– 0.4	– 15.7 %

Assessment of long-term GHG trend (1990–2009)

Emissions have decreased considerably in the 1990s, influenced by the economic restructuring affecting the country during that period. The transition process to market economy, which started after independence in 1991, provoked essential changes in all sectors of the national economy and resulted in large decreases of emissions. Between 2000 and 2007, emissions increased under the influence of increasing energy demand and road transport. Emissions decreased in 2008 and 2009, due to the economic crisis.

Assessment of short-term GHG trend (2008–2009)

The economic recession resulted in an overall emission decrease in all the main energy-related sources, in particular road transport (– 23 %). The increase in renewables also contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on EEA estimate of 2010 emissions.

([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

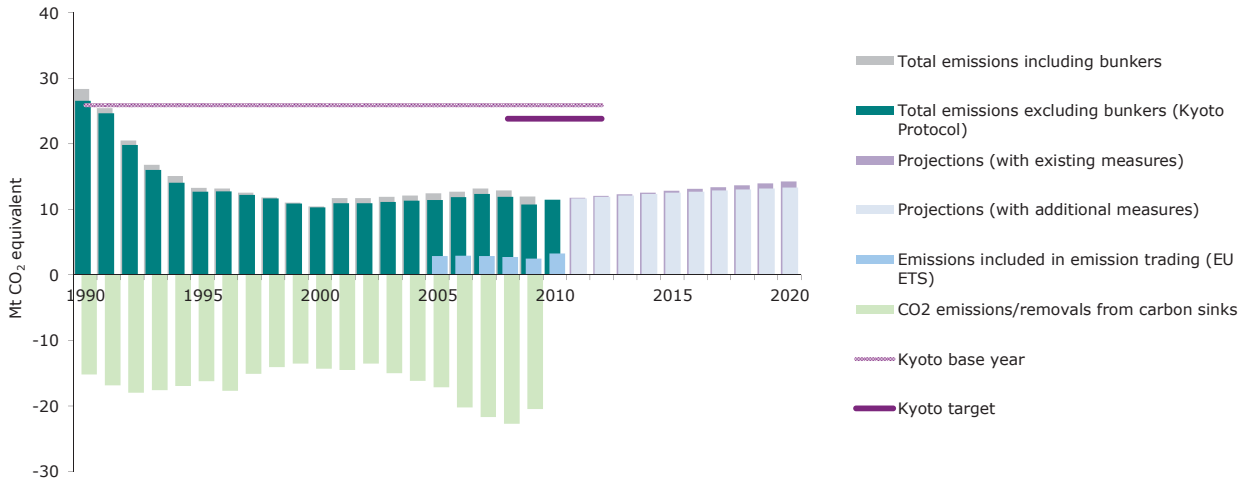
([6]) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

([7]) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

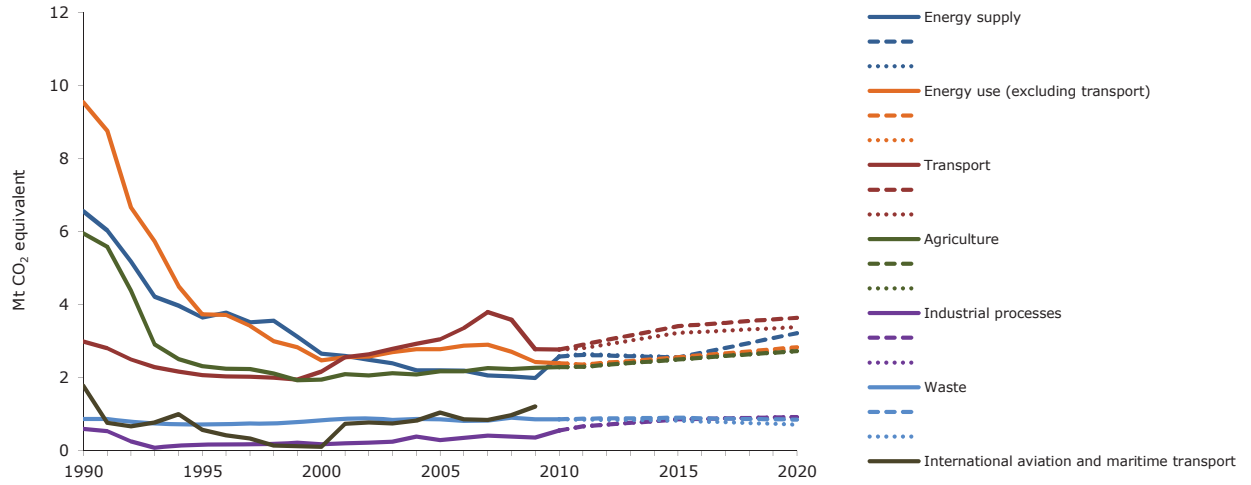
([8]) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

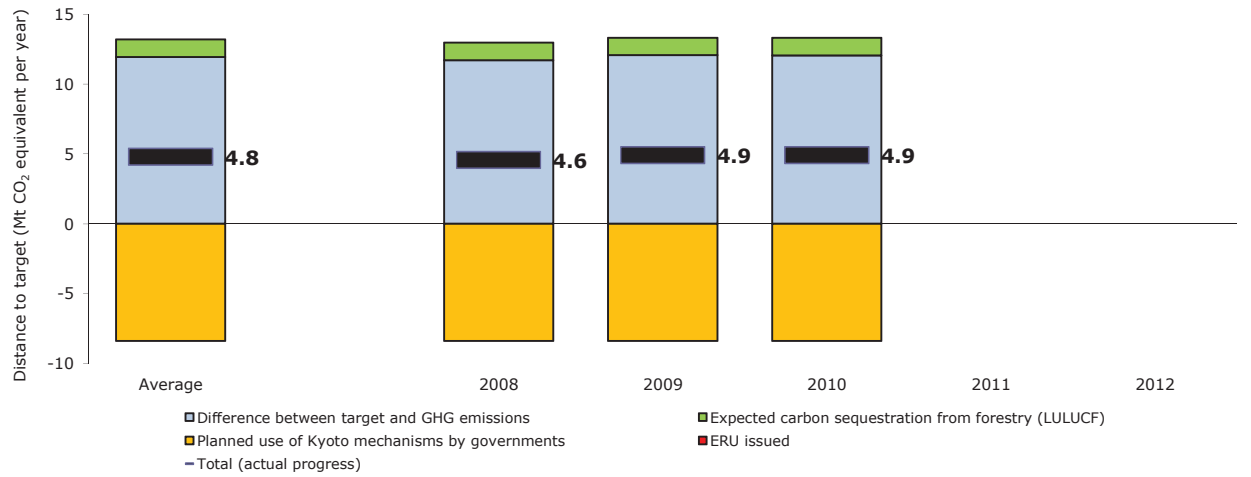


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Latvia were 56.1 % lower than the base-year level, well below the Kyoto target of -8 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly lower than their respective target, by an amount equivalent to 46.1 % the country's base-year emissions. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 4.8 % of base-year level emissions. Latvia intends to use the flexible mechanisms at government level by selling an amount of Kyoto units equivalent to 32.4 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Latvia were standing below their target level, by a gap representing 18.6 % of the base-year emissions. Latvia was therefore on track towards its Kyoto target by the end of 2010.



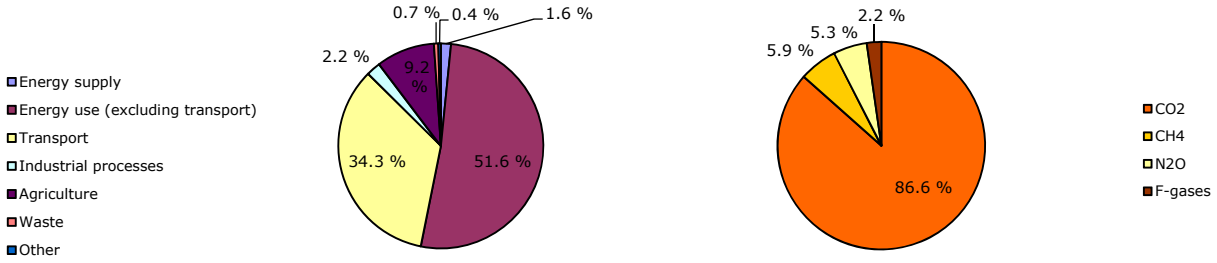
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Liechtenstein

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	0.23	0.26	0.25	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG from international bunkers ([4])	0.0004	0.0007	0.0009	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG per capita	8.1	7.4	7.0	n.a.	t CO_2-eq. / capita	n.a.	n.a.
GHG per GDP (constant prices) ([5])	n.a	n.a	n.a	n.a	g CO_2-eq. / euro		
EU ETS verified emissions - all installations ([6])		0.020	0.013	0.002	Mt CO_2-eq.	n.a.	n.a.
EU ETS verified emissions - constant scope ([7])		0.020	0.013	0.002	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		7.5 %	5.4 %	n.a.	%		
ETS verified emissions compared to annual allowances ([8])		– 5.8 %	– 31.4 %	– 89.8 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	0.018	7.8 %	– 0.016	– 6.1 %	n.a.	n.a.	n.a.	n.a.
GHG per capita	– 1.1	– 13.8 %	– 0.498	– 6.7 %	n.a.	n.a.	n.a.	n.a.
EU ETS verified emissions - all installations ([6])			– 0.007	– 32.7 %			– 0.012	– 86.6 %
EU ETS verified emissions - constant scope ([7])			– 0.007	– 32.7 %			– 0.007	– 32.7 %

Assessment of long-term GHG trend (1990–2009)

The main emission sources are the transport and the commercial sectors, along with the residential sector. Emissions have been increasing since the early 1990s, due to increased fuel combustion by households and services. During the period 1990–2008, the number of inhabitants increased by 23 % whereas employment increased by 40 %. This is reflected in a 31 % increase of related GHG emissions until 2006, with fluctuations caused by warm and cold winter periods. Emissions fell by almost a fourth between 2006 and 2007. This may have been due to a very high price for gas oil, which led people to reduce fuel consumption and to hold off the filling of their oil tanks. Simultaneously, warm winter months at the beginning and at the end of 2007 caused lower consumption of heating fuels. Accompanied by an extension of the gas-grid, natural gas has replaced gas oil as the main heating fuel in buildings. In parallel with the built-up of the gas supply network since 1990, fugitive emissions have strongly increased over the period. Emissions from agriculture show a minimum around 2000 due to decreasing and increasing animal numbers. Only few emissions from the waste sector are occurring, because municipal solid waste is exported to a Swiss incineration plant.

Assessment of short-term GHG trend (2008–2009)

Annual variations are mostly observed in energy use from households and services for heating purposes. CO2 emissions decreased between 2008 and 2009, while CH4 emissions remained stable. Beside the fluctuations in 2007 and 2008 caused by fuel price fluctuations followed by changing stocking behaviour for fuel tanks, a negative trend from 2006 to 2009 becomes apparent. High prices of fossil led to a smaller consumption of fossil fuels in 2007, when stocks were depleted, and higher apparent consumption in 2008, when fuel tanks were refilled. In 2009, the lower prices raised the demand of gas oil and the increase of the CO2-Tax on 1.1.2010 induced the consumers to refill their fuel tanks at the end of 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on EEA estimate of 2010 emissions.

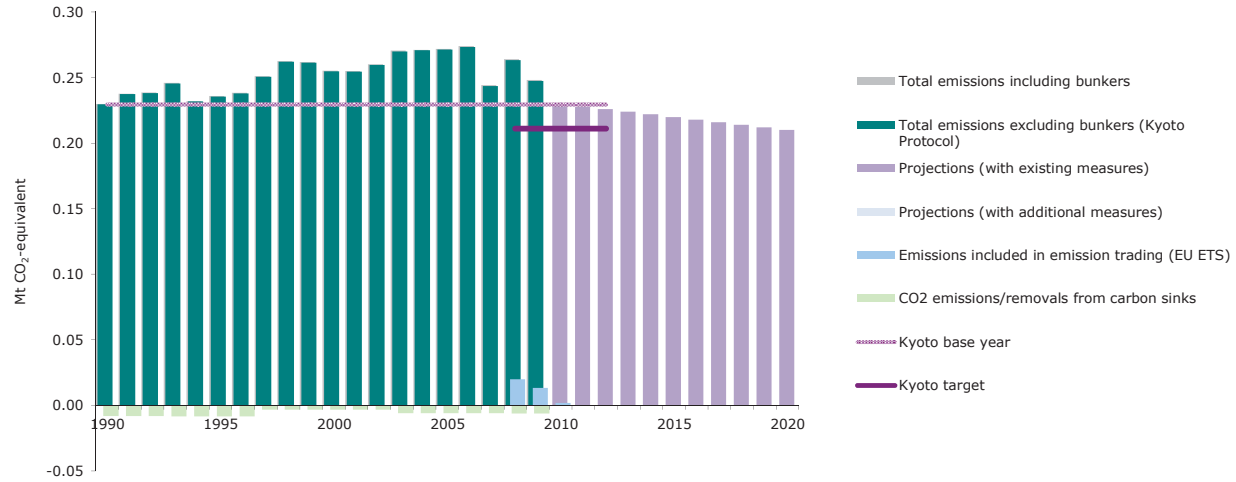
([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

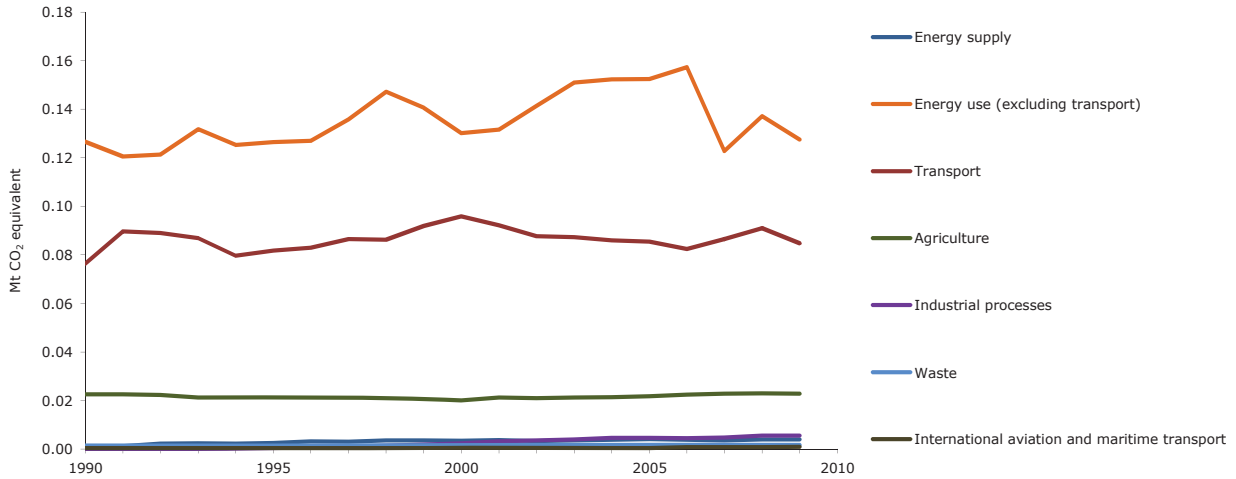
([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



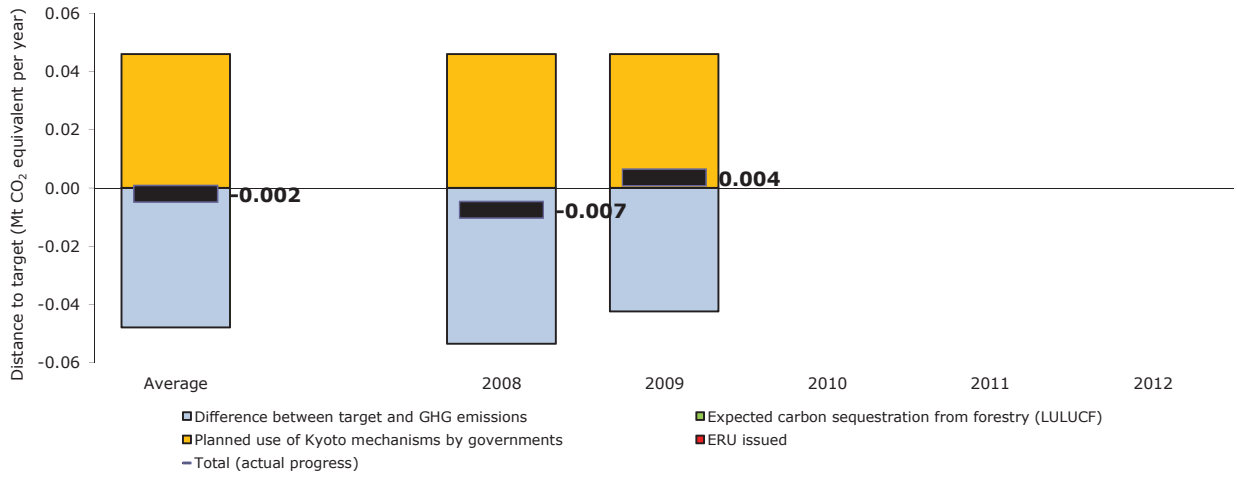
GHG trends 1990–2009 - emissions by sector



Source: National GHG inventory, 2011.

Progress towards Kyoto target

Average 2008–2009 emissions in Liechtenstein were 11.3 % higher than the base-year level, significantly above the Kyoto target of -8 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly higher than their respective target, by an amount equivalent to 20.9 % the country's base-year emissions. Liechtenstein intends to use the flexible mechanisms at government level by acquiring an amount of Kyoto units equivalent to 20 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Liechtenstein were standing above their target level, by a gap representing 0.8 % of the base-year emissions. Liechtenstein was therefore not on track towards its Kyoto target by the end of 2009. This gap can be considered small, however, especially in comparison with the gaps currently observed in other countries for which emissions are also above their respective target.



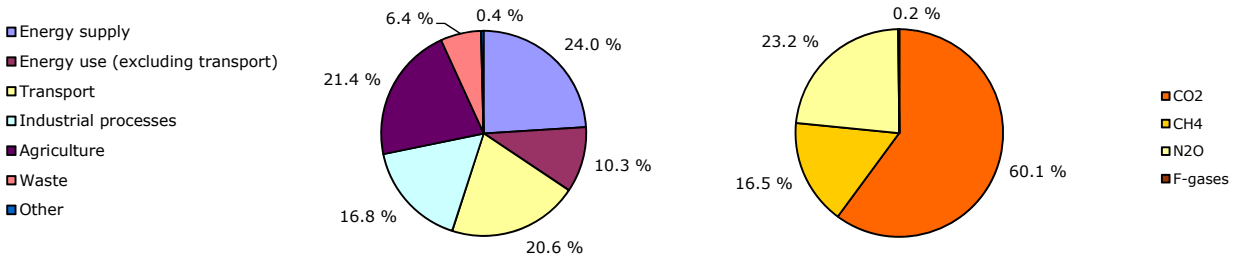
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Lithuania

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	49.6	24.0	21.6	22.3	Mt CO_2-eq.	21	n.a.
GHG from international bunkers ([4])	0.7	0.5	0.5	n.a.	Mt CO_2-eq.	25	n.a.
GHG per capita	13.4	7.1	6.5	6.7	t CO_2-eq. / capita	25	n.a.
GHG per GDP (constant prices) ([5])	2 885	1 094	1 154	1 177	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	0.9 %	0.5 %	0.5 %	0.5 %	%		
EU ETS verified emissions - all installations ([6])		6.1	5.8	6.4	Mt CO_2-eq.	23	n.a.
EU ETS verified emissions - constant scope ([7])		6.1	5.8	6.4	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		25.4 %	26.8 %	28.6 %	%		
ETS verified emissions compared to annual allowances ([8])		– 18.7 %	– 23.6 %	– 21.7 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 28.0	– 56.4 %	– 2.4	– 10.1 %	– 27.2	– 54.9 %	0.7	3.4 %
GHG per capita	– 7.0	– 51.9 %	– 0.7	– 9.6 %	– 6.7	– 50.0 %	0.3	4.0 %
EU ETS verified emissions - all installations ([6])			– 0.3	– 5.2 %			0.6	10.5 %
EU ETS verified emissions - constant scope ([7])			– 0.3	– 5.2 %			– 0.3	– 5.2 %

Assessment of long-term GHG trend (1990–2009)

The most significant reduction in GHG emissions was observed immediately after the declaration of independence. From 1991 to 1993, total emissions decreased by more than 50 %, mainly due to the sharp decline of activity in energy and industrial sectors. A 3-fold decrease of emissions was observed for manufacturing and construction industries. The reduction of GHG emissions in agriculture was less dramatic, but still reached about 40 % within two years. After the 1990s, emissions have increased steadily until 2007, driven by economic development. Lithuania was hit hard by the economic crisis, leading to a first decline in emissions in 2008, followed by a 10 % reduction between 2008 and 2009.

Assessment of short-term GHG trend (2008–2009)

With a 14.8 % drop of GDP in 2009, Lithuania was severely affected by the economic crisis. Emission reductions mainly occurred in the cement and chemical (ammonia and nitric acid production) industries. Another important decrease was reported for emissions from road transportation. The increase in renewables also contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on EEA estimate of 2010 emissions.

([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

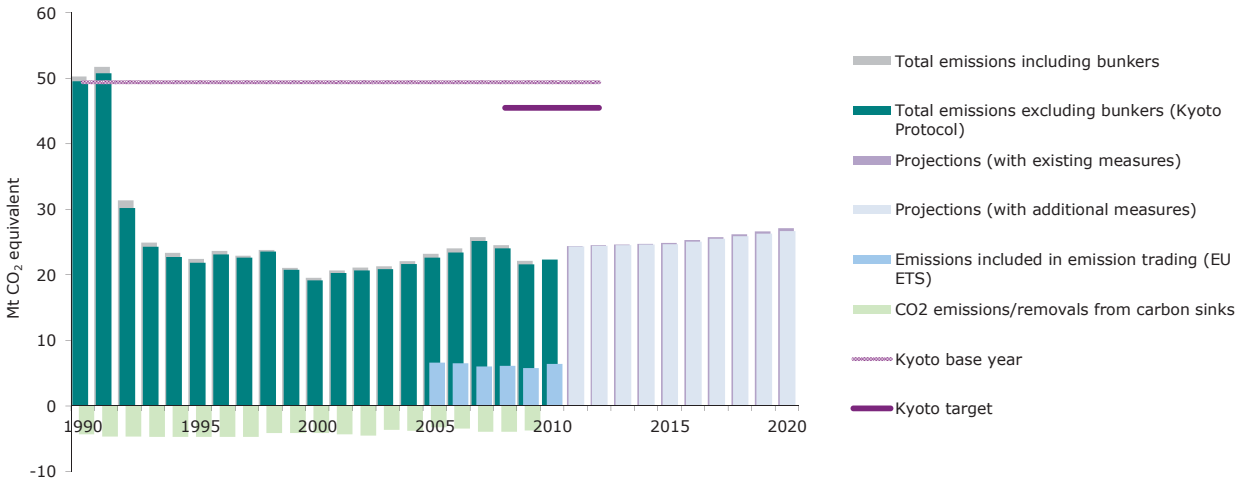
([6]) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

([7]) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

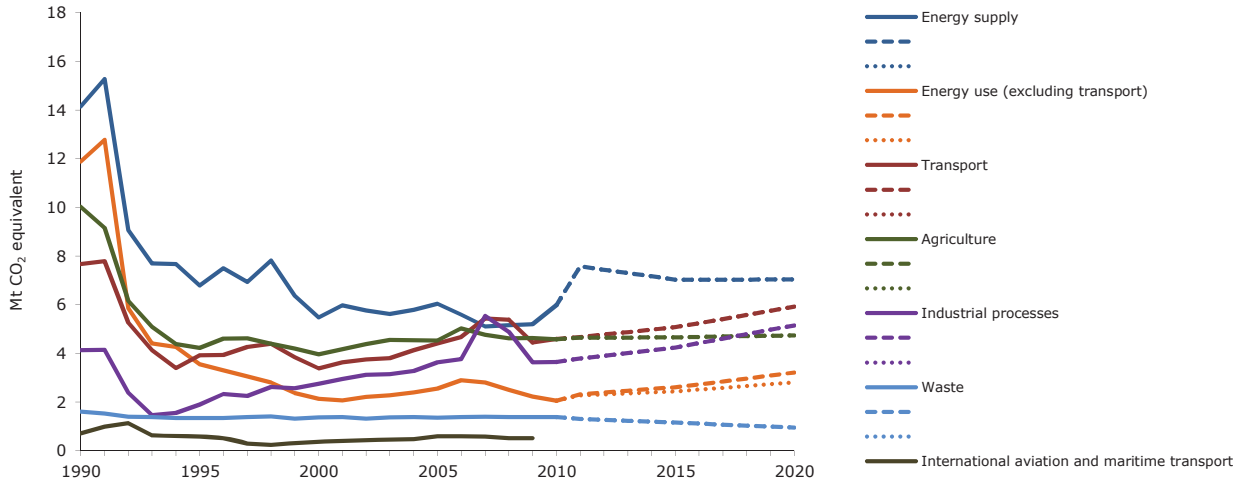
([8]) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

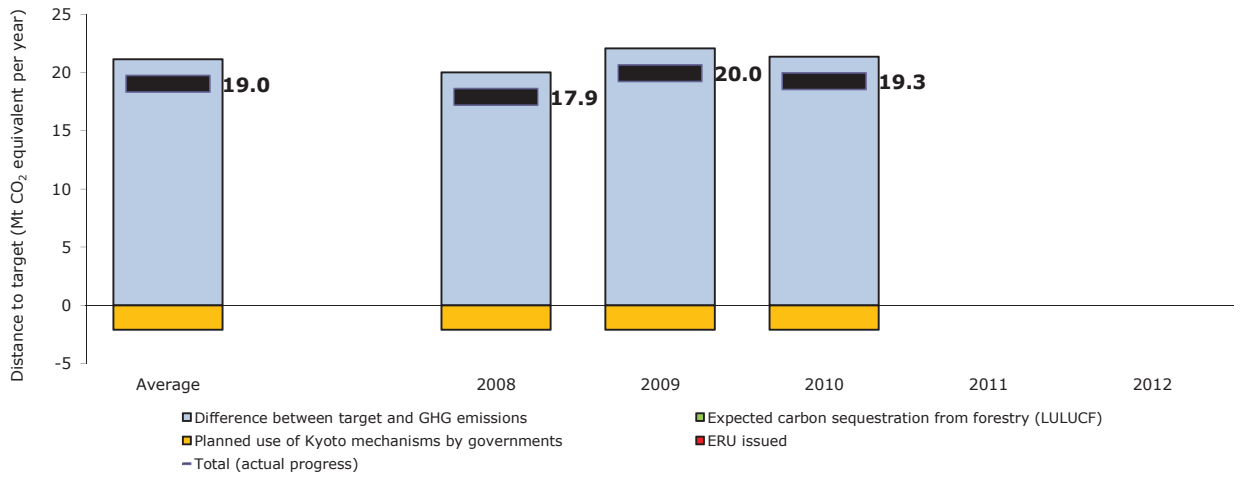


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Lithuania were 54.1 % lower than the base-year level, well below the Kyoto target of -8 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly lower than their respective target, by an amount equivalent to 42.8 % the country's base-year emissions. Lithuania intends to use the flexible mechanisms at government level by selling an amount of Kyoto units equivalent to 4.2 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Lithuania were standing below their target level, by a gap representing 38.5 % of the base-year emissions. Lithuania was therefore on track towards its Kyoto target by the end of 2010.



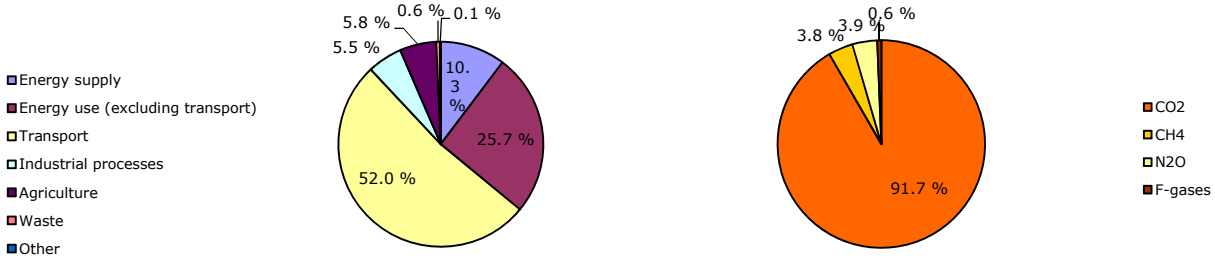
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Luxembourg

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	12.8	12.3	11.7	12.2	Mt CO_2-eq.	24	15
GHG from international bunkers ([4])	0.40	1.32	1.27	n.a.	Mt CO_2-eq.	17	15
GHG per capita	33.8	25.3	23.7	24.4	t CO_2-eq. / capita	1	1
GHG per GDP (constant prices) ([5])	953	411	407	411	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	0.2 %	0.2 %	0.3 %	0.3 %	%		
EU ETS verified emissions - all installations ([6])		2.10	2.18	2.25	Mt CO_2-eq.	26	15
EU ETS verified emissions - constant scope ([7])		2.10	2.18	2.25	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		17.1 %	18.7 %	18.4 %	%		
ETS verified emissions compared to annual allowances ([8])		– 15.6 %	– 12.3 %	– 9.5 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 1.1	– 8.9 %	– 0.6	– 4.7 %	– 0.6	– 4.7 %	0.5	4.6 %
GHG per capita	– 10.1	– 30.0 %	– 1.7	– 6.6 %	– 9.5	– 28.0 %	0.7	2.9 %
EU ETS verified emissions - all installations ([6])			0.08	3.9 %			0.07	3.3 %
EU ETS verified emissions - constant scope ([7])			0.08	3.9 %			0.08	3.9 %

Assessment of long-term GHG trend (1990–2009)

After a strong decline between 1993 and 1998, due in particular to the conversion of the steel industry to electric arc furnaces, emissions increased sharply up to 2004, mainly driven by the road transport and power generation sectors. They stabilized between 2004 and 2006 and experienced in 2007 a significant decrease for the first time since 1998. High transport emissions are mainly driven by 'road fuel exports' (road fuels sold to non-residents) resulting from lower fuel prices, an important cross–border workforce and of Luxembourg's location at the heart of a main traffic axes for Western Europe. However, these emissions decreased between 2006 and 2009, combined with a diminution of GHG emissions from the power generation sector.

Assessment of short-term GHG trend (2008–2009)

Repercussions of the economic crisis to heavy good transportation were the main reason for emission decreases. Declining steel production added to this trend. These reductions were partly offset by increases in public electricity and heat production, mainly due to the increased electricity production level by the Twinerg gas turbine, which was on a maintenance stop for several months in 2008.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on national estimate of 2010 emissions.

([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

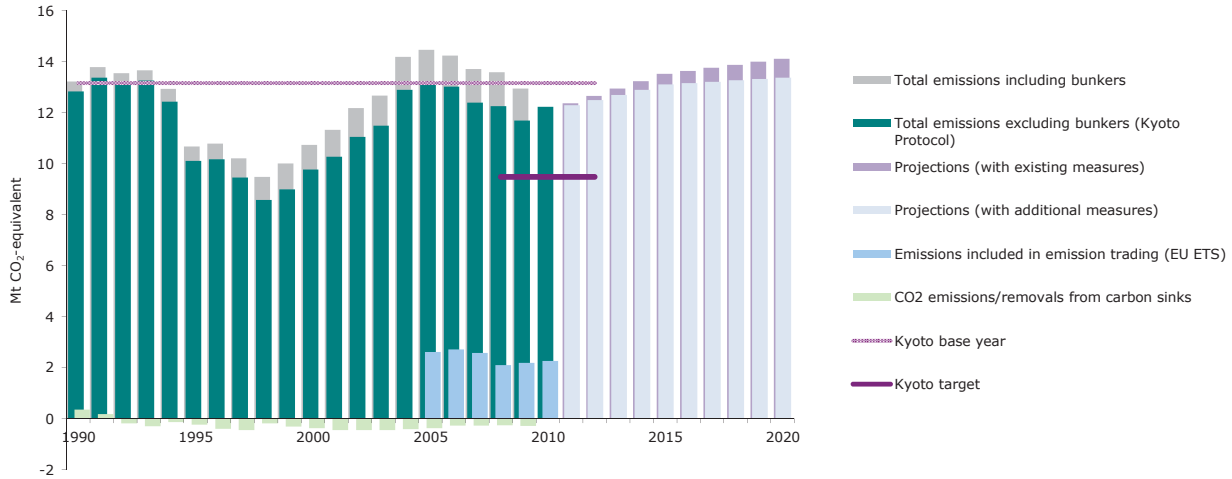
([6]) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

([7]) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

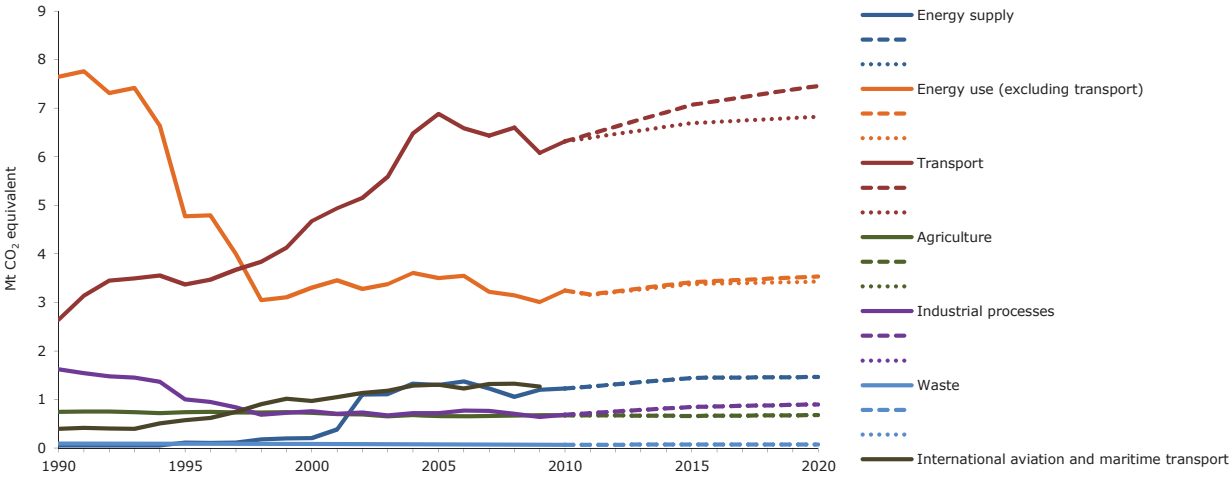
([8]) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

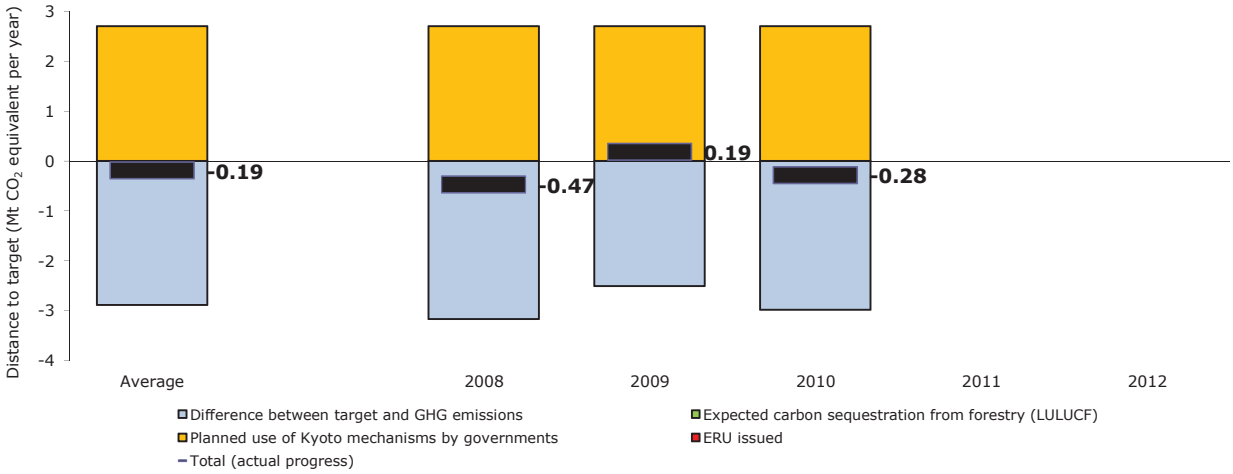


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Luxembourg were 8.4 % lower than the base-year level, significantly above the burden-sharing target of -28 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly higher than their respective target, by an amount equivalent to 21.9 % the country's base-year emissions. Luxembourg intends to use the flexible mechanisms at government level by acquiring an amount of Kyoto units equivalent to 20.5 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Luxembourg were standing above their target level, by a gap representing 1.4 % of the base-year emissions. Luxembourg was therefore not on track towards its burden-sharing target by the end of 2010. This gap can be considered small, however, especially in comparison with the gaps currently observed in other Member States for which emissions are also above their respective target.



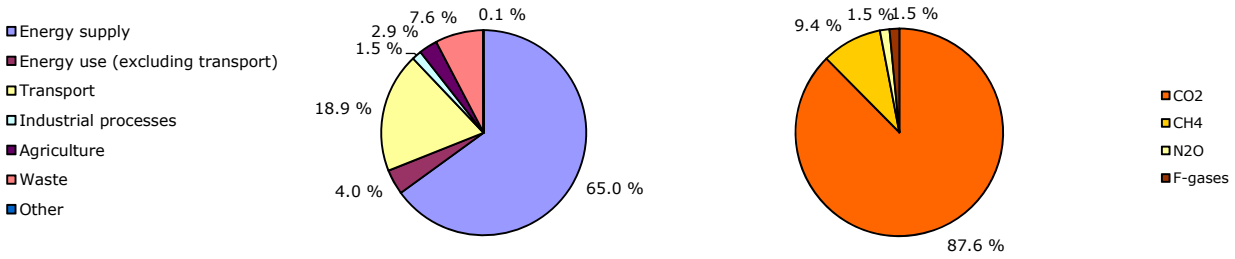
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Malta

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	2.07	3.01	2.87	2.87	Mt CO_2-eq.	27	n.a.
GHG from international bunkers ([4])	n.a.	2.96	3.65	n.a.	Mt CO_2-eq.	12	n.a.
GHG per capita	5.9	7.3	6.9	6.9	t CO_2-eq. / capita	22	n.a.
GHG per GDP (constant prices) ([5])	816	596	588	567	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	0.0 %	0.1 %	0.1 %	0.1 %	%		
EU ETS verified emissions - all installations ([6])		2.0	1.9	1.9	Mt CO_2-eq.	27	n.a.
EU ETS verified emissions - constant scope ([7])		2.0	1.9	1.9	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		67.1 %	66.2 %	65.5 %	%		
ETS verified emissions compared to annual allowances ([8])		– 4.2 %	– 10.6 %	– 13.0 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	0.80	38.8 %	– 0.14	– 4.7 %	0.8	38.9 %	0.00	0.1 %
GHG per capita	1.07	18.2 %	– 0.40	– 5.5 %	1.1	18.5 %	0.02	0.3 %
EU ETS verified emissions - all installations ([6])			– 0.12	– 6.0 %			– 0.02	– 1.0 %
EU ETS verified emissions - constant scope ([7])			– 0.12	– 6.0 %			– 0.12	– 6.0 %

Assessment of long-term GHG trend (1990–2009)

Emissions increased by 39 % over the whole period, but declined in 2008 and 2009 following a long period of increase. The trends observed over the last two decades reflect the strong economic development that has taken place over the past two decades, resulting in an increased demand for energy, an increasing waste generation and an increasing demand for road transport. On average, per capita emissions have risen from around 5.6 tonnes per head in 1990 to 6.8 tonnes per head in 2009.

Assessment of short-term GHG trend (2008–2009)

Malta experienced a slight emission decrease. The largest emission reductions occurred in the energy industry, in particular the production of public electricity and heat production, with minor reductions from iron and steel production.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on EEA estimate of 2010 emissions.

([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

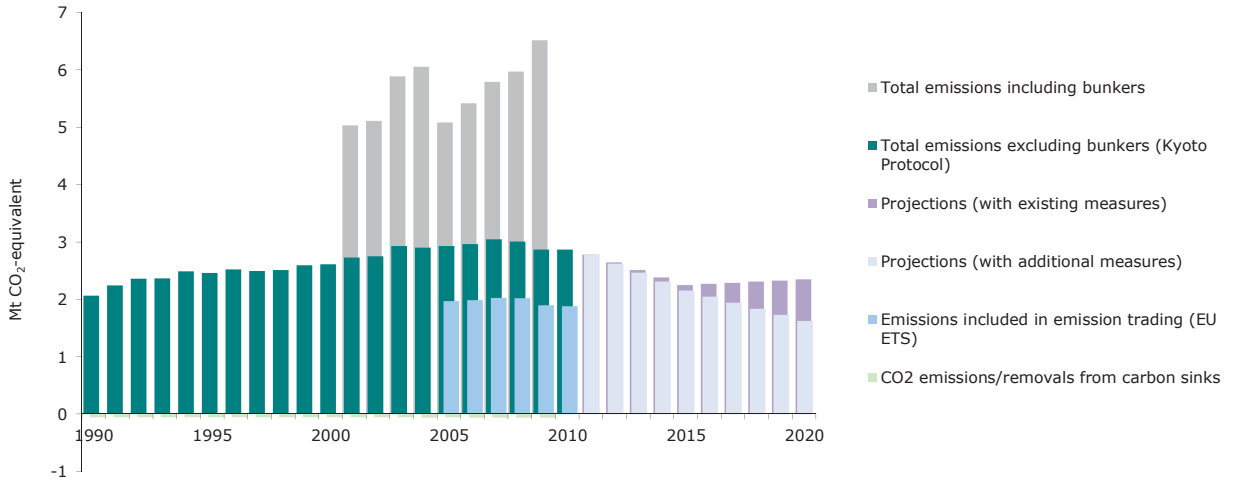
([6]) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

([7]) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

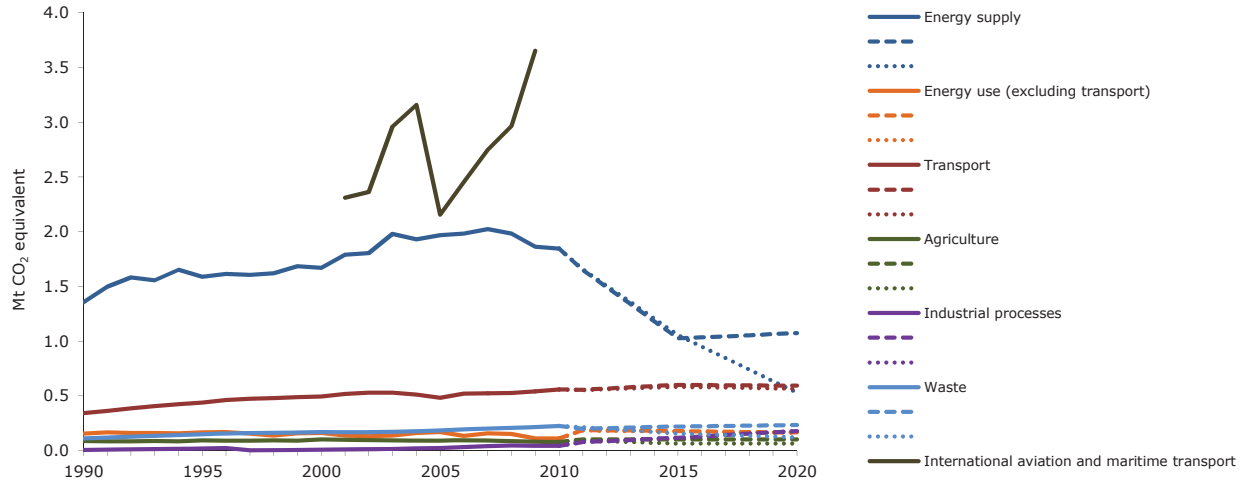
([8]) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector



Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

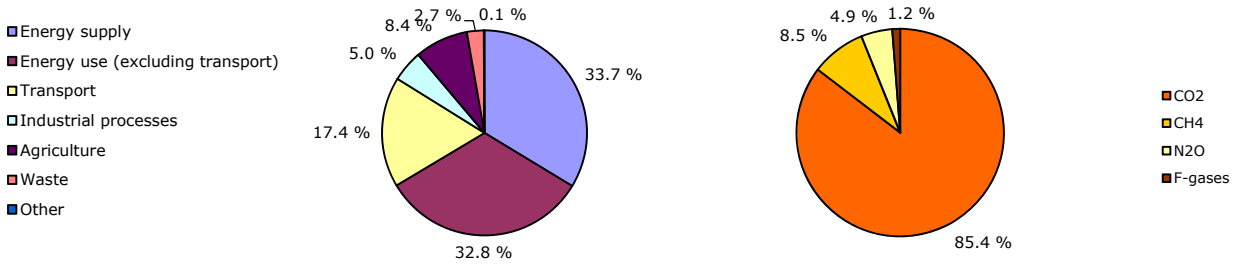
Malta does not have a target under the Kyoto Protocol.

GHG trends and projections in the Netherlands

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	211.9	204.6	198.9	210.7	Mt CO_2-eq.	7	6
GHG from international bunkers ([4])	39.0	60.8	56.1	1.0	Mt CO_2-eq.	1	1
GHG per capita	14.2	12.5	12.1	12.7	t CO_2-eq. / capita	6	4
GHG per GDP (constant prices) ([5])	692	419	424	441	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	3.8 %	4.1 %	4.3 %	4.5 %	%		
EU ETS verified emissions - all installations ([6])		83.5	81.0	84.4	Mt CO_2-eq.	7	6
EU ETS verified emissions - constant scope ([7])		83.0	80.9	83.4	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		40.8 %	40.7 %	40.1 %	%		
ETS verified emissions compared to annual allowances ([8])		8.8 %	– 3.3 %	– 9.1 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 13.0	– 6.1 %	– 5.7	– 2.8 %	– 1.2	– 0.6 %	11.8	5.9 %
GHG per capita	– 2.2	– 15.2 %	– 0.4	– 3.3 %	– 1.5	– 10.7 %	0.6	5.4 %
EU ETS verified emissions - all installations ([6])			– 2.5	– 3.0 %			3.4	4.2 %
EU ETS verified emissions - constant scope ([7])			– 2.1	– 2.5 %			– 2.1	– 2.5 %

Assessment of long-term GHG trend (1990–2009)

Overall, total emissions remained relatively stable, with current levels slightly lower than in 1990. The 13 % increase in (mostly CO2) emissions from the energy sector was mainly observed in energy industries and road transport, It was offset by emission reductions in manufacturing and construction industries. CH4 emissions decreased by 34 %. N2O emissions decreased by about 52 %, mainly in the industrial processes. Emissions of fluorinated gases decreased significantly, following the installation of a thermal afterburner for the production of halocarbons and SF6.

Assessment of short-term GHG trend (2008–2009)

Emissions decreased in the energy sector due to a decrease in the use of fossil fuels as a result of the economic crisis. Reductions in emissions from petroleum refining, manufacturing industries and road transport were mainly responsible for the overall decrease. The increase in renewables also contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on national estimate of 2010 emissions.

([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

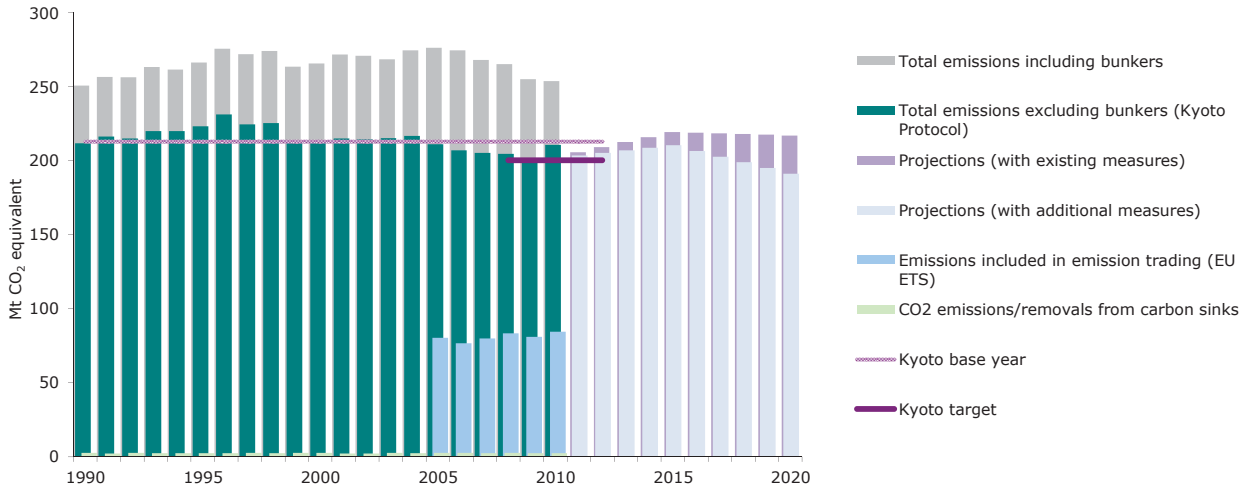
([6]) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

([7]) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

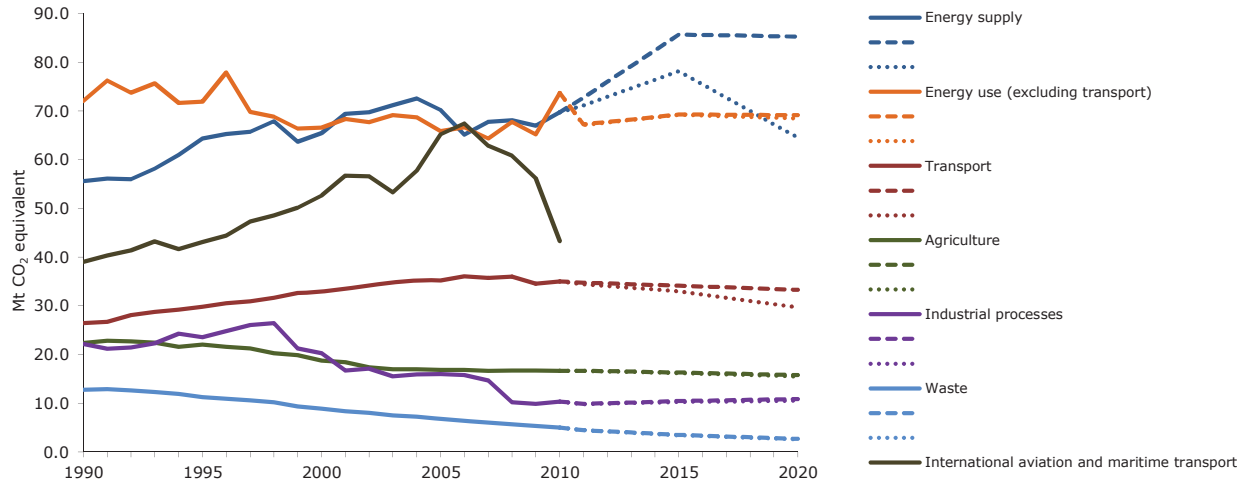
([8]) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

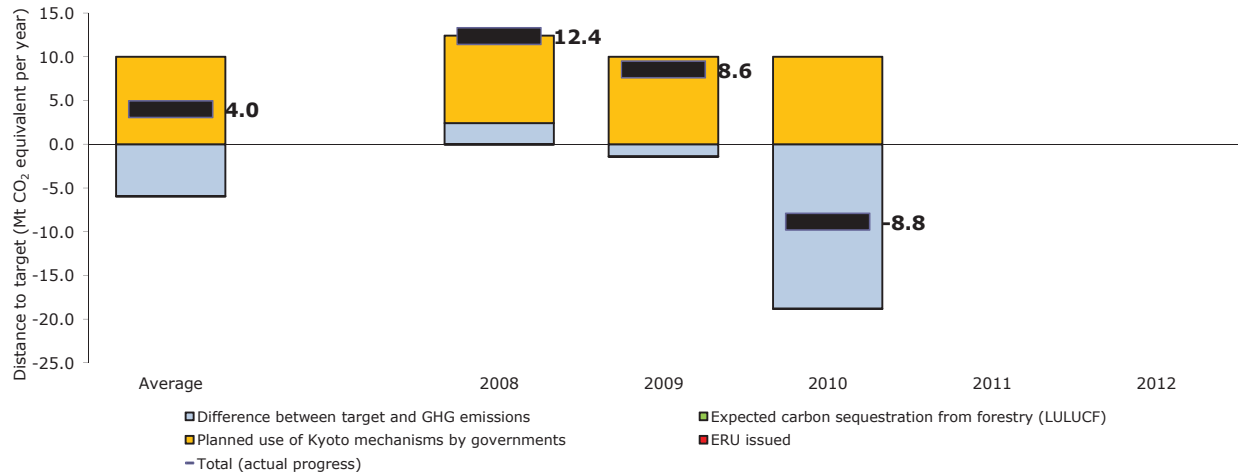


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Netherlands were 3.9 % lower than the base-year level, above the burden-sharing target of -6 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were higher than their respective target, by an amo



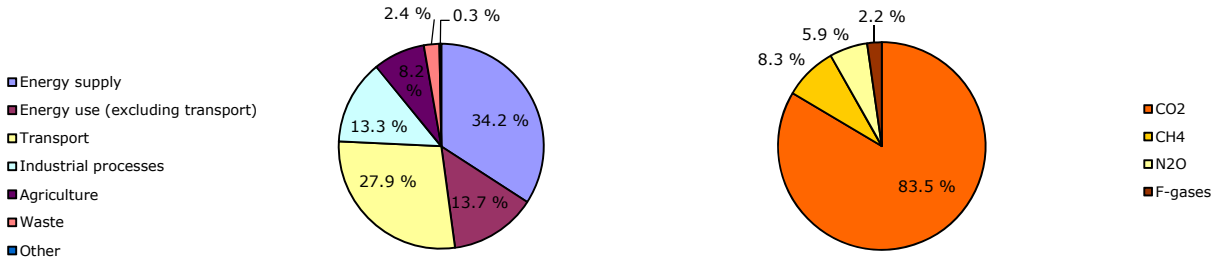
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Norway

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	49.8	53.7	51.3	53.7	Mt CO_2-eq.	n.a.	n.a.
GHG from international bunkers ([4])	2.1	3.3	2.9	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG per capita	11.8	11.3	10.7	11.1	t CO_2-eq. / capita	n.a.	n.a.
GHG per GDP (constant prices) ([5])	392	249	241	251	g CO_2-eq. / euro		
EU ETS verified emissions - all installations ([6])		19.3	19.2	19.3	Mt CO_2-eq.	n.a.	n.a.
EU ETS verified emissions - constant scope ([7])		19.3	19.2	18.9	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		36.0 %	37.5 %	36.0 %	%		
ETS verified emissions compared to annual allowances ([8])		156.9 %	– 7.0 %	34.6 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	1.5	3.1 %	– 2.5	– 4.6 %	4.0	8.0 %	2.5	4.8 %
GHG per capita	– 1.1	– 9.1 %	– 0.7	– 5.8 %	– 0.7	– 6.0 %	0.4	3.4 %
EU ETS verified emissions - all installations ([6])			– 0.1	– 0.7 %			0.1	0.6 %
EU ETS verified emissions - constant scope ([7])			– 0.1	– 0.7 %			– 0.1	– 0.7 %

Assessment of long-term GHG trend (1990–2009)

Norway has experienced economic growth since 1990, with only minor setbacks in the early nineties. This explains the general increase in emissions, in particular from energy use, both in energy industries and for transportation. The total emissions show a marked decrease between 1990 and 1992, mainly due to the low economic activity during that time and the CO2 tax, implemented with effect from 1991, which led to a decrease in the consumption of gasoline and fuel oils as well as reduced production of metals. Emissions increased thereafter, and they have remained relatively stable after 1999. The decrease observed between 2001 and 2002 was due to close-downs and reductions in the ferroalloy industry and magnesium industry, reduced flaring in the oil and gas extraction sector and reduced domestic navigation. Emissions decreased again in 2005 due to high prices on heating oil and lower production volumes in the industry. Increases in emissions in 2003, due to a cold winter combined with low generation of hydropower (due to a long dry period). Emissions from transport showed an overall increase of about 29 per cent from 1990 to 2009, while the emissions decreased by more than 2 per cent from 2008 to 2009. The share of transport in the total GHG emissions has increased from 22 per cent in 1990 to almost 28 per cent in 2009. Due to technical improvements in production of nitric acid, and despite increased production, the total emissions of N2O have decreased by 36 per cent since 1990.

Assessment of short-term GHG trend (2008–2009)

The decrease in emissions was mainly due to decreased production of ferroalloys and aluminium (e.g. one Søderberg production line was closed down), reduced production of nitric acid connected with improved technology and decreased emission from road traffic. Also, fugitive emissions from oil and natural gas decreased by more than 18 per cent from 2008 to 2009. The reduction was primarily counteracted by increased emissions from gas-fired electricity power plants.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on national estimate of 2010 emissions.

([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

([6]) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

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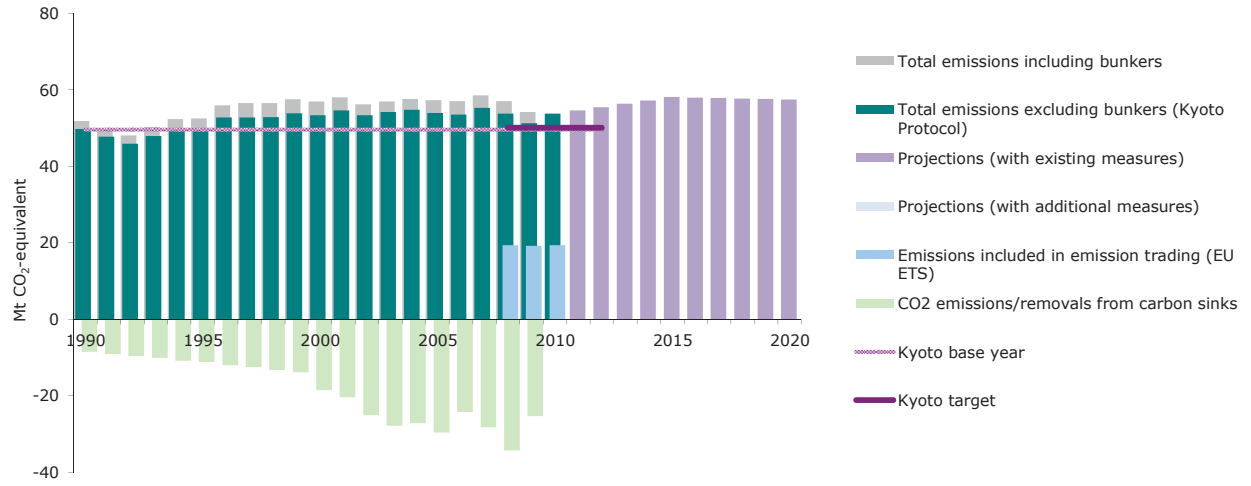
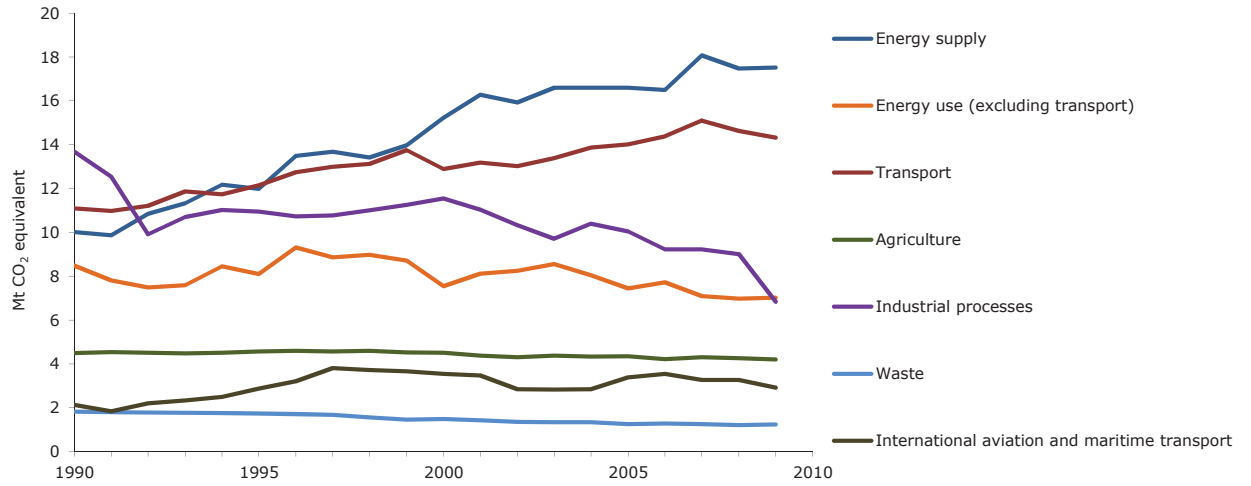
([8]) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



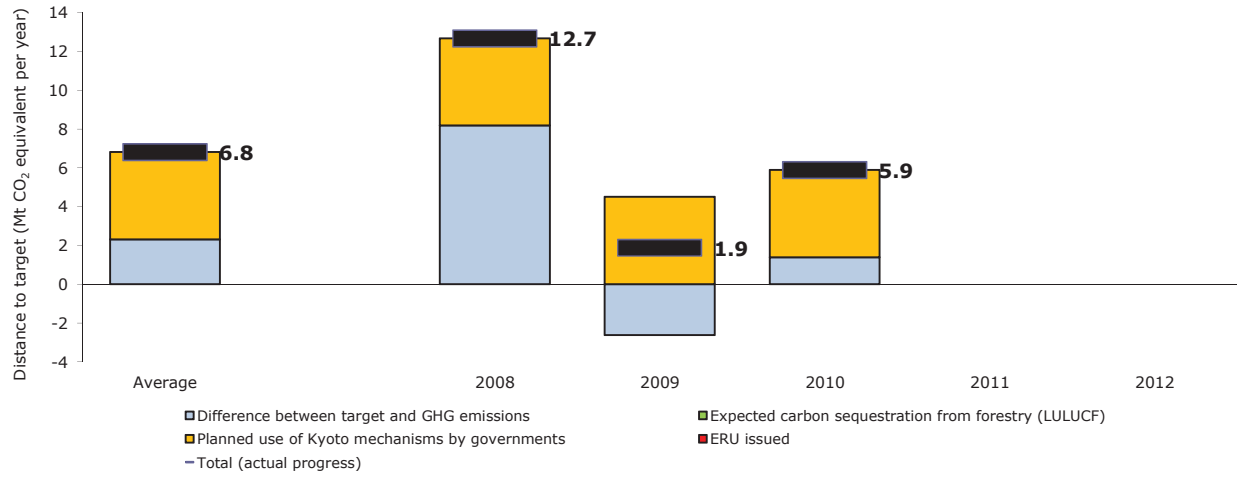
GHG trends 1990–2009 - emissions by sector



Source: National GHG inventory, 2011.

Progress towards Kyoto target

Average 2008–2010 emissions in Norway were 6.7 % higher than the base-year level, significantly above the Kyoto target of 1 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were lower than their respective target, by an amount equivalent to 4.7 % the country's base-year emissions. Norway intends to use the flexible mechanisms at government level by acquiring an amount of Kyoto units equivalent to 9.1 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Norway were standing below their target level, by a gap representing 13.7 % of the base-year emissions. Norway was therefore on track towards its Kyoto target by the end of 2010.



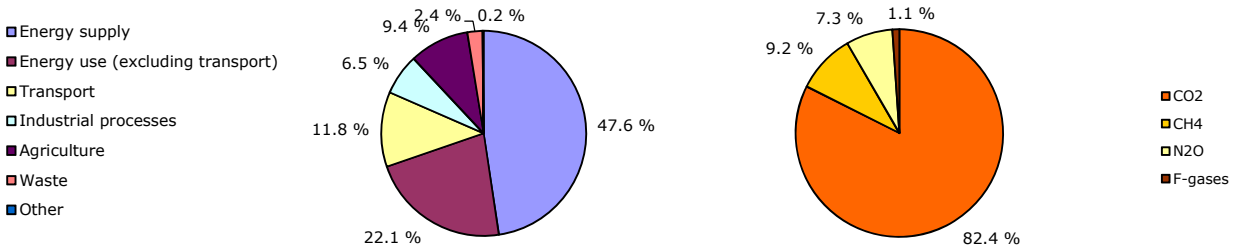
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Poland

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	452.9	395.7	376.7	393.3	Mt CO_2-eq.	5	n.a.
GHG from international bunkers ([4])	1.9	2.5	2.2	n.a.	Mt CO_2-eq.	15	n.a.
GHG per capita	11.9	10.4	9.9	10.3	t CO_2-eq. / capita	12	n.a.
GHG per GDP (constant prices) ([5])	3 535	1 535	1 437	1 446	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	8.1 %	8.0 %	8.2 %	8.3 %	%		
EU ETS verified emissions - all installations ([6])		204.1	191.2	199.7	Mt CO_2-eq.	3	n.a.
EU ETS verified emissions - constant scope ([7])		204.1	191.0	199.3	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		51.6 %	50.8 %	50.8 %	%		
ETS verified emissions compared to annual allowances ([8])		1.5 %	– 5.4 %	– 2.7 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 76.3	– 16.8 %	– 19.1	– 4.8 %	– 59.7	– 13.2 %	16.6	4.4 %
GHG per capita	– 2.0	– 17.1 %	– 0.5	– 4.9 %	– 1.6	– 13.5 %	0.4	4.3 %
EU ETS verified emissions - all installations ([6])			– 12.9	– 6.3 %			8.6	4.5 %
EU ETS verified emissions - constant scope ([7])			– 13.1	– 6.4 %			– 13.1	– 6.4 %

Assessment of long-term GHG trend (1990–2009)

Between 1988 and 1990, emissions decreased dramatically, triggered by significant economic changes, especially in heavy industry, related to the political transformation from a centralised to a market economy. Emissions continued to decline until 1993, thereafter rising and peaking in 1996 as a result of modernisation processes implemented in heavy industry and other sectors and dynamic economic growth. The succeeding years are characterised by a slow decline in emissions until to 2002, as a result of energy efficiency improvements, followed by a slight increase up to 2006 caused by sustained economic development. A decrease in emissions can be observed since 2007.

Assessment of short-term GHG trend (2008–2009)

Emissions decrease in most sectors, in particular the production of electricity and heat, iron and steel production, cement production, nitric acid production and agriculture. The implementation of joint implementation projects resulted in significant N2O abatement (and consequently of the national N2O emission factor), which led to reduced emissions in the nitric acid production. The increase in renewables also contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on national estimate of 2010 emissions.

([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

([6]) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

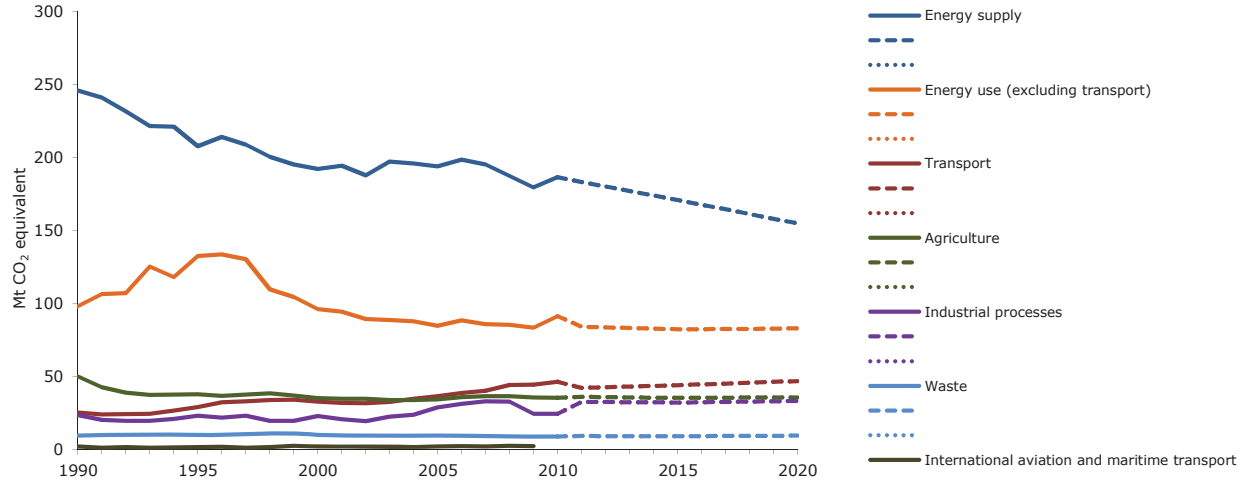
([7]) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

([8]) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions

GHG trends and projections 1990–2020 — emissions by sector

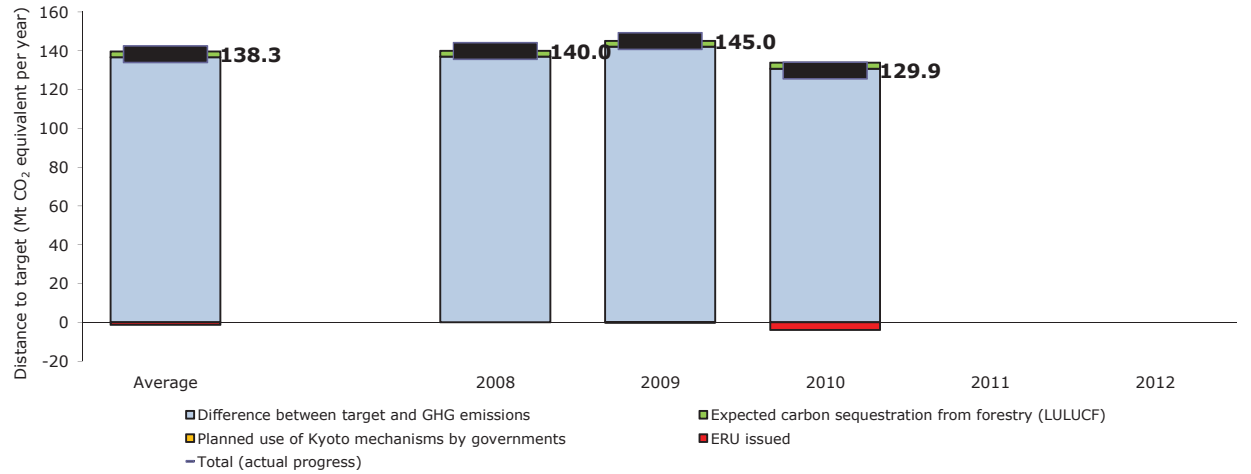


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Poland were 31 % lower than the base-year level, well below the Kyoto target of -6 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly lower than their respective target, by an amount equivalent to 24.3 % the country's base-year emissions. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 0.5 % of base-year level emissions. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Poland were standing below their target level, by a gap representing 24.6 % of the base-year emissions. Poland was therefore on track towards its Kyoto target by the end of 2010.



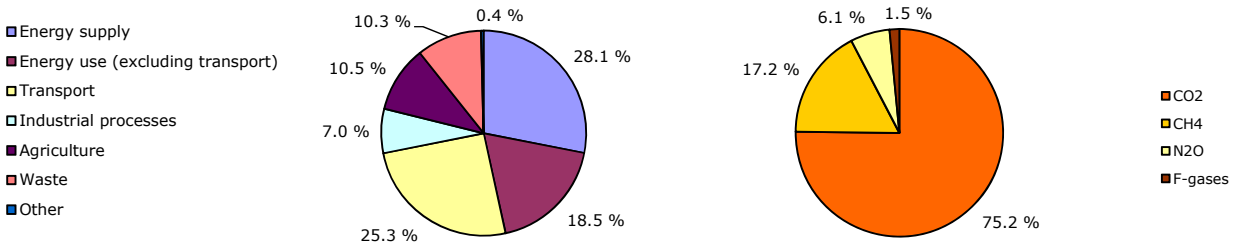
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Portugal

European Environment Agency

Key GHG data (1)	1990	2008	2009	2010 (2)	Unit	Rank in EU-27 (3)	Rank in EU-15 (3)
Total greenhouse gas emissions (GHG)	59.4	77.9	74.6	74.8	Mt CO_2-eq.	13	10
GHG from international bunkers (4)	2.9	4.6	4.2	n.a.	Mt CO_2-eq.	10	10
GHG per capita	5.9	7.3	7.0	7.0	t CO_2-eq. / capita	21	14
GHG per GDP (constant prices) (5)	632	568	557	551	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	1.1 %	1.6 %	1.6 %	1.6 %	%		
EU ETS verified emissions - all installations (6)		29.9	28.3	24.2	Mt CO_2-eq.	14	10
EU ETS verified emissions - constant scope (7)		29.9	27.8	22.7	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		38.4 %	37.9 %	32.3 %	%		
ETS verified emissions compared to annual allowances (8)		– 1.9 %	– 8.9 %	– 26.0 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 (1) (9)



Key GHG trends	1990–2009		2008–2009		1990–2010 (2)		2009–2010 (2)	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	15.2	25.5 %	– 3.4	– 4.3 %	15.4	25.9 %	0.2	0.3 %
GHG per capita	1.1	18.1 %	– 0.3	– 4.4 %	1.1	18.3 %	0.0	0.2 %
EU ETS verified emissions - all installations (6)			– 1.7	– 5.6 %			– 4.1	– 14.5 %
EU ETS verified emissions - constant scope (7)			– 2.1	– 7.1 %			– 2.1	– 7.1 %

Assessment of long-term GHG trend (1990–2009)

Emissions have been increasing in the 1990s, mainly driven by a strong economic growth. The greatest increases occurred in the transport sector (rapid growth in private car ownership) and the energy sector, due to a continued increase of electricity demand (driven in particular by the residential/commercial sector), which reflects the country's dependence on fossil fuels for electricity generation and transportation. Since 2000, emissions have stabilised and even been reduced in recent years. This is in part due to the introduction of natural gas (1997), the installation of combined cycle thermoelectric plants using natural gas (1999), the progressive installation of cogeneration units, the amelioration of energetic and technologic efficiency of industrial processes, the improvement in car efficiency and fuel quality improvement. In most recent years, wind power production strongly increased and accounted for about 15 % gross electricity production in 2009. Rising emissions from industrial processes up to 2008 were mostly due to the increase of cement production, road paving, limestone and dolomite use, lime production and, glass and ammonia production. The decrease in emissions from agriculture reflects the declining role of this sector in the national economy, and is associated for instance with the reduction of the livestock production (e.g. swine) and the decreased use of fertilizers. In the waste sector, emissions grew significantly in the 1990s, primarily because of rising waste generation and waste disposal on land.

Assessment of short-term GHG trend (2008–2009)

As a result of the economic crisis, large decreases occurred in fuel-related emissions from manufacturing industries and process-related emissions in the cement and chemical industries. However, emissions from waste disposal on land continued to increase. The increase in renewables also contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

(2) Based on EEA estimate of 2010 emissions.

(3) Comparison of 2009 values, 1 = highest value among EU countries.

(4) International bunkers: international aviation and international maritime transport.

(5) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

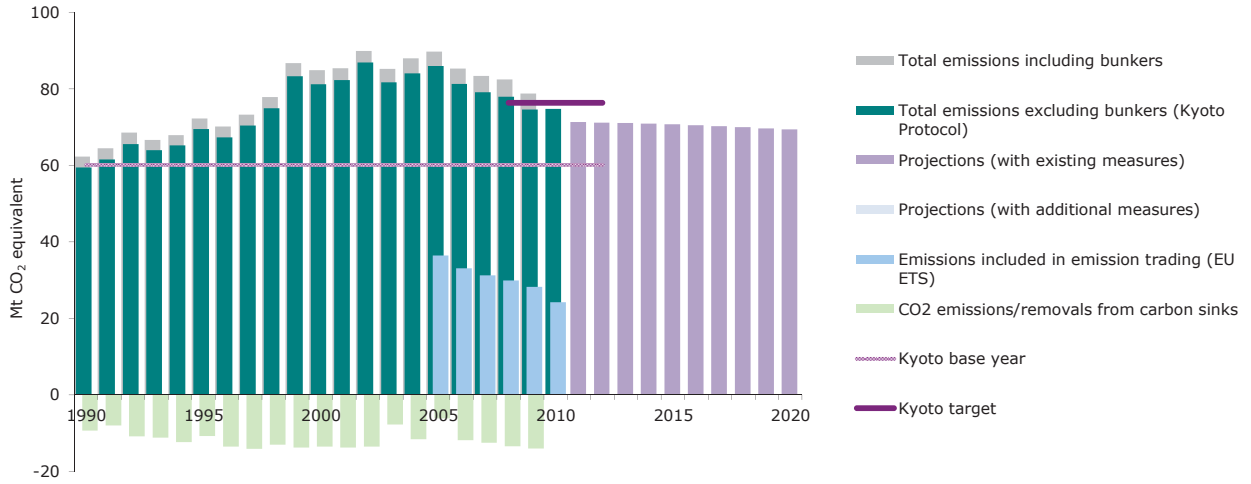
(6) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

(7) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

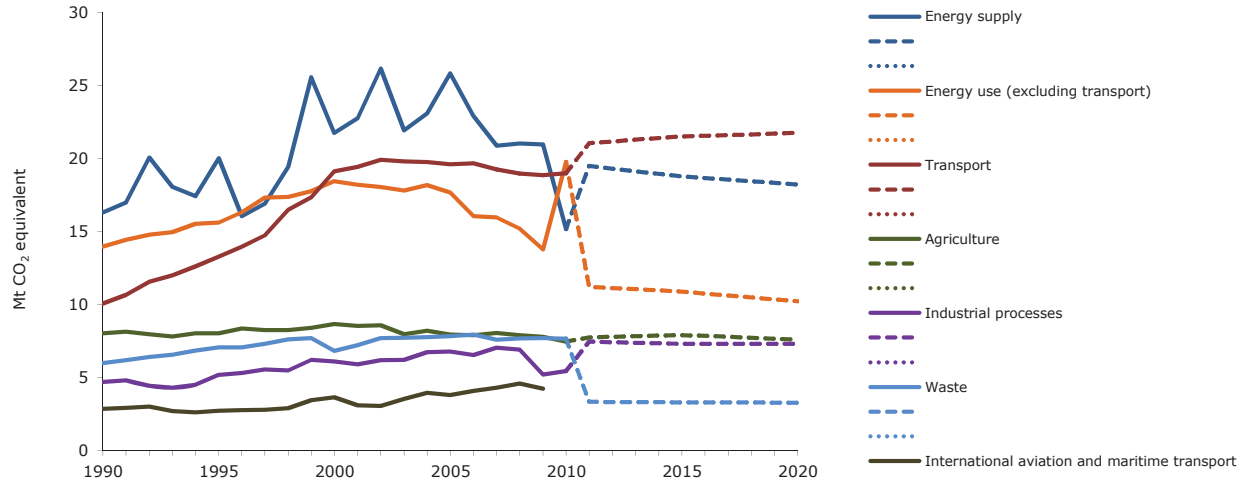
(8) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

(9) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

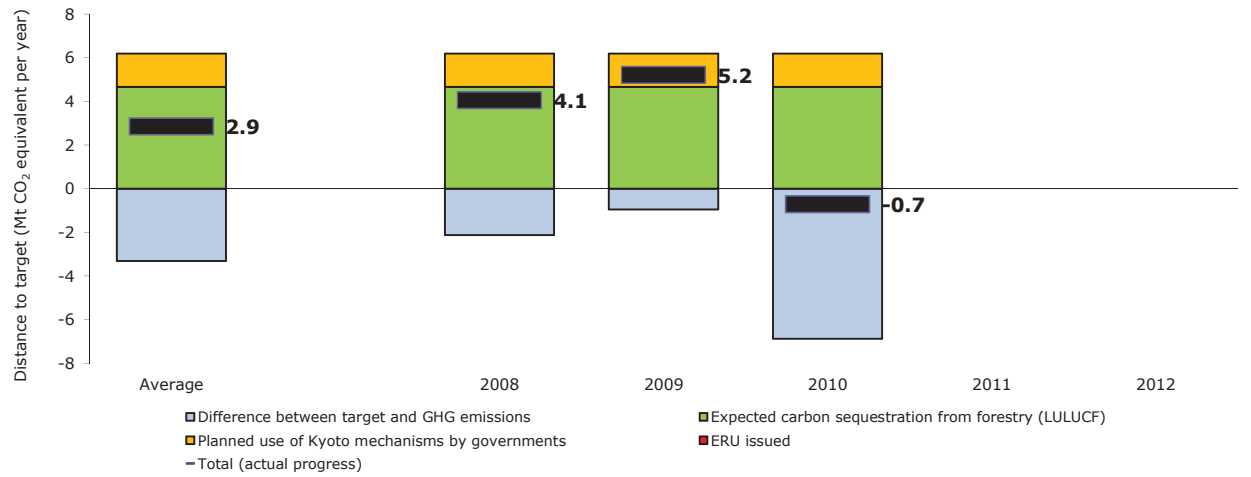


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; Primes–Gains projections, 2010.

Progress towards Kyoto target

Average 2008–2010 emissions in Portugal were 26 % higher than the base-year level, below the Kyoto target of 27 % for the period 2008–2012. However, in the sectors not covered by the EU ETS, emissions were significantly higher than their respective target, by an amount equivalent to 5.5 % the country's base-year emissions. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 7.8 % of base-year level emissions. Portugal intends to use the flexible mechanisms at government level by acquiring an amount of Kyoto units equivalent to 2.5 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Portugal were standing below their target level, by a gap representing 4.8 % of the base-year emissions. Portugal was therefore on track towards its Kyoto target by the end of 2010.



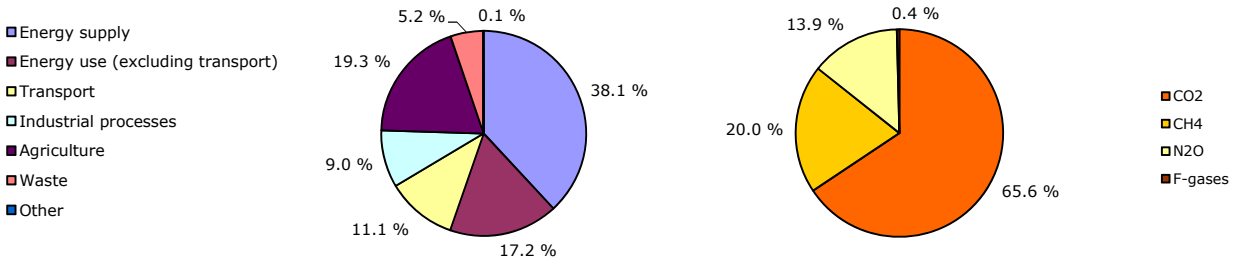
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Romania

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	250.1	153.4	130.8	129.7	Mt CO_2-eq.	9	n.a.
GHG from international bunkers ([4])	1.1	1.1	1.0	n.a.	Mt CO_2-eq.	22	n.a.
GHG per capita	10.8	7.1	6.1	6.0	t CO_2-eq. / capita	26	n.a.
GHG per GDP (constant prices) ([5])	5 411	2 321	2 130	2 138	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	4.5 %	3.1 %	2.8 %	2.7 %	%		
EU ETS verified emissions - all installations ([6])		64.1	49.0	47.3	Mt CO_2-eq.	10	n.a.
EU ETS verified emissions - constant scope ([7])		64.0	48.9	46.7	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		41.8 %	37.5 %	36.5 %	%		
ETS verified emissions compared to annual allowances ([8])		– 10.7 %	– 33.7 %	– 36.8 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 (2)		2009–2010 (2)	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 119.3	– 47.7 %	– 22.6	– 14.7 %	– 120.4	– 48.2 %	– 1.2	– 0.9 %
GHG per capita	– 4.7	– 43.5 %	– 1.0	– 14.6 %	– 4.7	– 43.9 %	– 0.0	– 0.7 %
EU ETS verified emissions - all installations ([6])			– 15.1	– 23.5 %			– 1.7	– 3.4 %
EU ETS verified emissions - constant scope ([7])			– 15.1	– 23.6 %			– 15.1	– 23.6 %

Assessment of long-term GHG trend (1990–2009)

Total emissions decreased significantly in the 1990s, following the transition process to a market economy but increased between 1999 and 2008. The decrease in energy-related emissions was due to the decline of economic activities and energy consumption. Public electricity and heat production was by far the largest contributor to emission decreases, followed by manufacturing industries and fugitive emissions from energy industries. Emissions from industrial processes decreased due to reduced industrial production levels (in particular in the chemical, mineral and metal industries). In the agriculture sector, the decline of livestock populations, the decreased use of synthetic fertilizer and the decline of cultivated areas and crop productions drove emissions down. Waste emissions increased due to consumption growth, an increase in the number of waste management sites and an increase in the percentage of the population connected to sewerage.

Assessment of short-term GHG trend (2008–2009)

The considerable decrease in emissions compared to 2008 represented the second largest decrease in percentage terms across the whole EU. The largest decreases were observed in the production of public electricity and heat, followed by direct fuel use from manufacturing industries and process-related emissions from the cement, lime and, iron and steel industry. Also N2O emissions from nitric acid dropped considerably, mainly due to the introduction abatement measures in two plants in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on EEA estimate of 2010 emissions.

([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

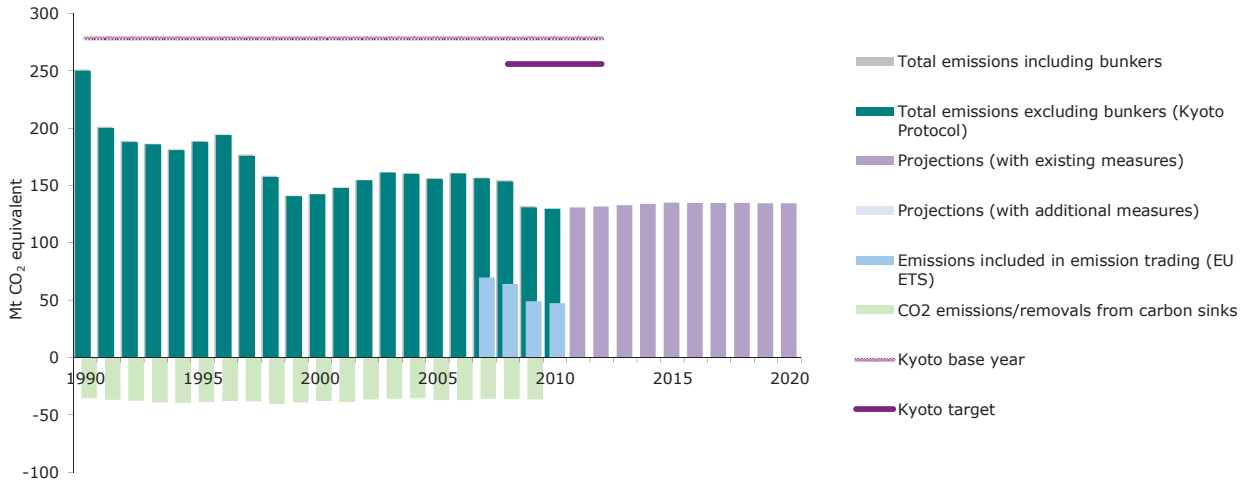
([6]) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

([7]) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

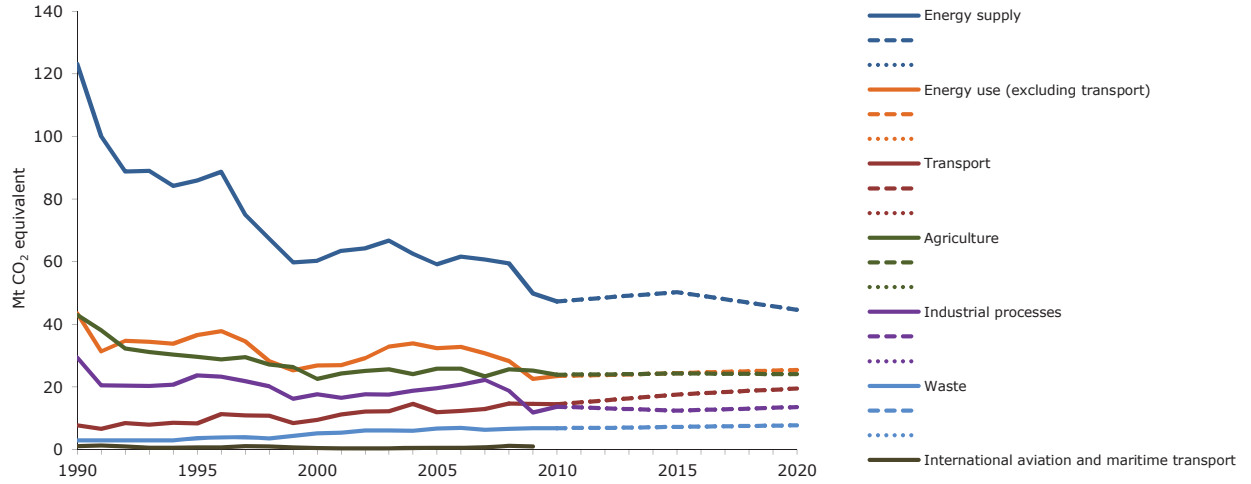
([8]) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

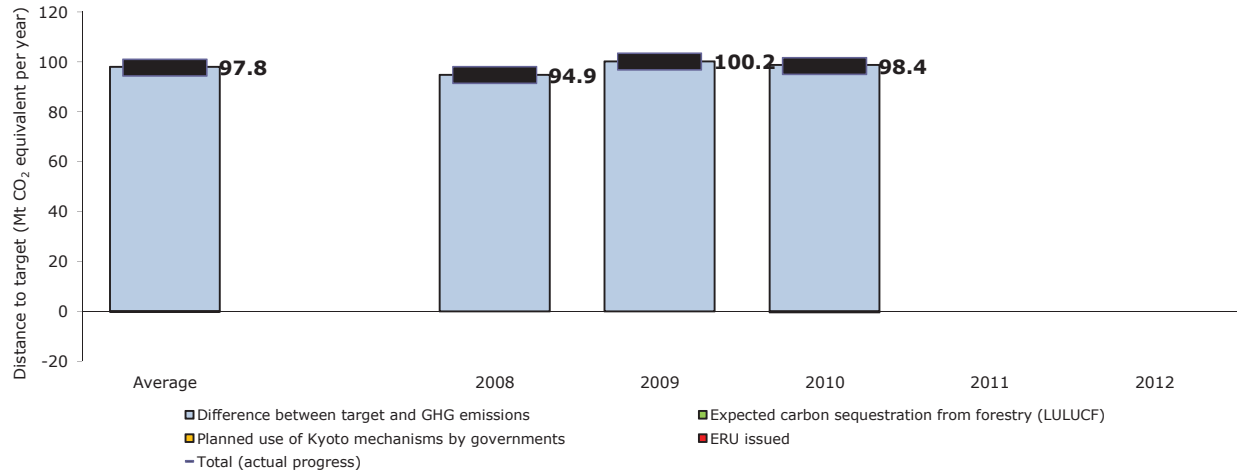


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; Primes–Gains projections, 2010.

Progress towards Kyoto target

Average 2008–2010 emissions in Romania were 50.4 % lower than the base-year level, well below the Kyoto target of -8 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly lower than their respective target, by an amount equivalent to 35.2 % the country's base-year emissions. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Romania were standing below their target level, by a gap representing 35.2 % of the base-year emissions. Romania was therefore on track towards its Kyoto target by the end of 2010.



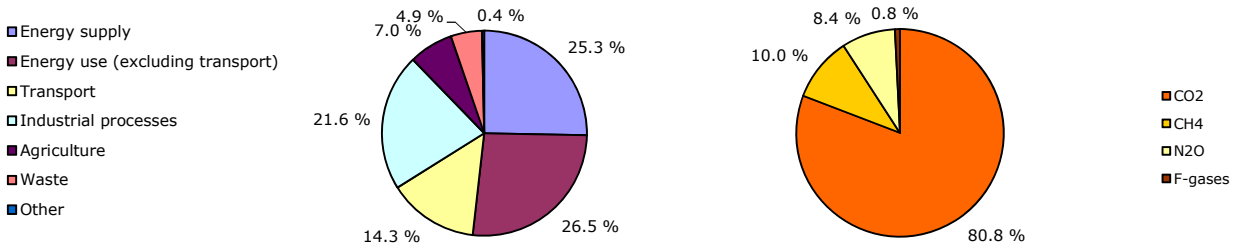
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Slovakia

European Environment Agency

Key GHG data (1)	1990	2008	2009	2010 (2)	Unit	Rank in EU-27 (3)	Rank in EU-15 (3)
Total greenhouse gas emissions (GHG)	74.1	48.2	43.4	44.0	Mt CO_2-eq.	20	n.a.
GHG from international bunkers (4)	0.1	0.2	0.1	n.a.	Mt CO_2-eq.	27	n.a.
GHG per capita	14.0	8.9	8.0	8.1	t CO_2-eq. / capita	19	n.a.
GHG per GDP (constant prices) (5)	3 974	1 355	1 282	1 250	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	1.3 %	1.0 %	0.9 %	0.9 %	%		
EU ETS verified emissions - all installations (6)		25.3	21.6	21.7	Mt CO_2-eq.	18	n.a.
EU ETS verified emissions - constant scope (7)		25.1	20.8	20.7	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		52.6 %	49.8 %	49.3 %	%		
ETS verified emissions compared to annual allowances (8)		– 21.2 %	– 32.8 %	– 32.9 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 (1) (9)



Key GHG trends	1990–2009		2008–2009		1990–2010 (2)		2009–2010 (2)	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 30.7	– 41.4 %	– 4.8	– 9.9 %	– 30.1	– 40.6 %	0.6	1.4 %
GHG per capita	– 6.0	– 42.8 %	– 0.9	– 10.1 %	– 5.9	– 42.1 %	0.1	1.2 %
EU ETS verified emissions - all installations (6)			– 3.7	– 14.8 %			0.1	0.5 %
EU ETS verified emissions - constant scope (7)			– 4.3	– 17.1 %			– 4.3	– 17.1 %

Assessment of long-term GHG trend (1990–2009)

Total emissions decreased significantly in the 1990s and have remained relatively stable since — with a declining trend in recent years. The decreasing trend over the whole period was mainly driven by decreases in the energy and agriculture sectors. Important decreases were observed in particular in energy-related emissions (public electricity and heat generation and direct energy use by manufacturing industries, households and services). Emissions from transport and waste increased, whereas emissions from industrial processes were below 1990 levels after the strong drop in 2009.

Assessment of short-term GHG trend (2008–2009)

As a result of the economic crisis, fuel-related emissions from manufacturing industries and process-related emissions from mineral and metal production decreased most. In addition, emissions from public electricity and heat production and from transport declined considerably. The increase in renewables also contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

(2) Based on EEA estimate of 2010 emissions.

(3) Comparison of 2009 values, 1 = highest value among EU countries.

(4) International bunkers: international aviation and international maritime transport.

(5) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

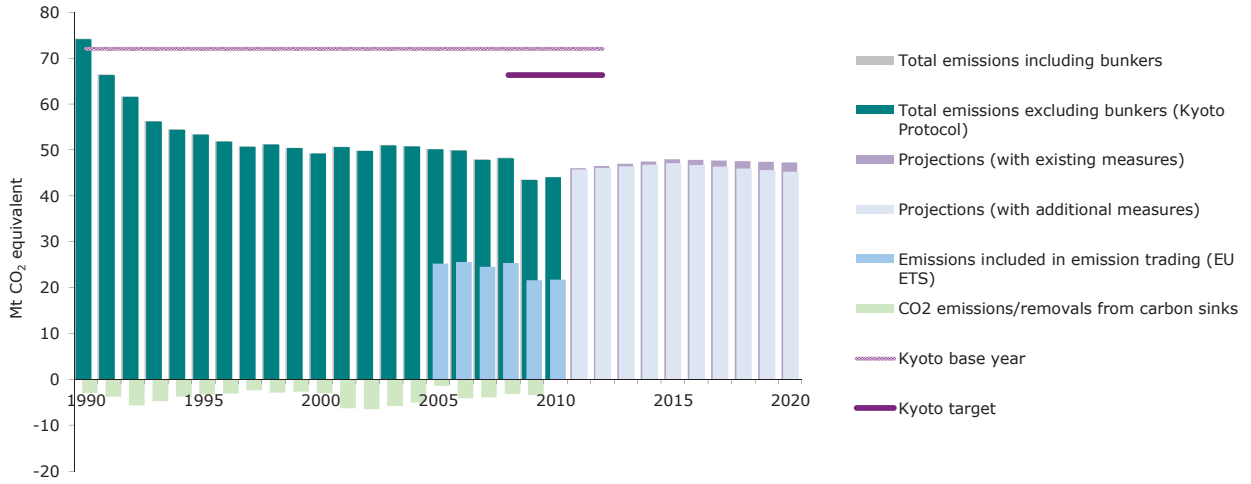
(6) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

(7) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

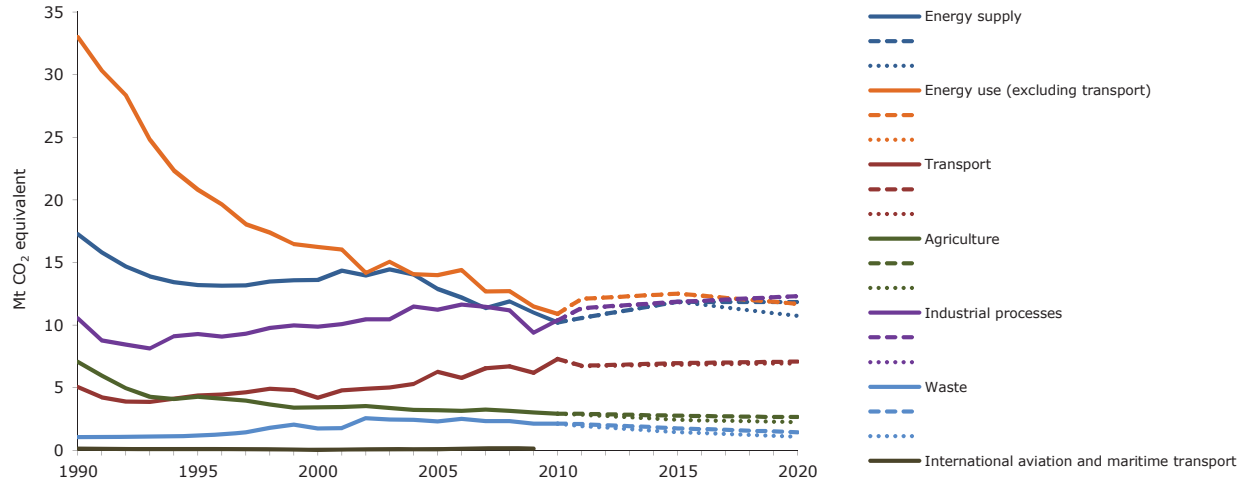
(8) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

(9) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

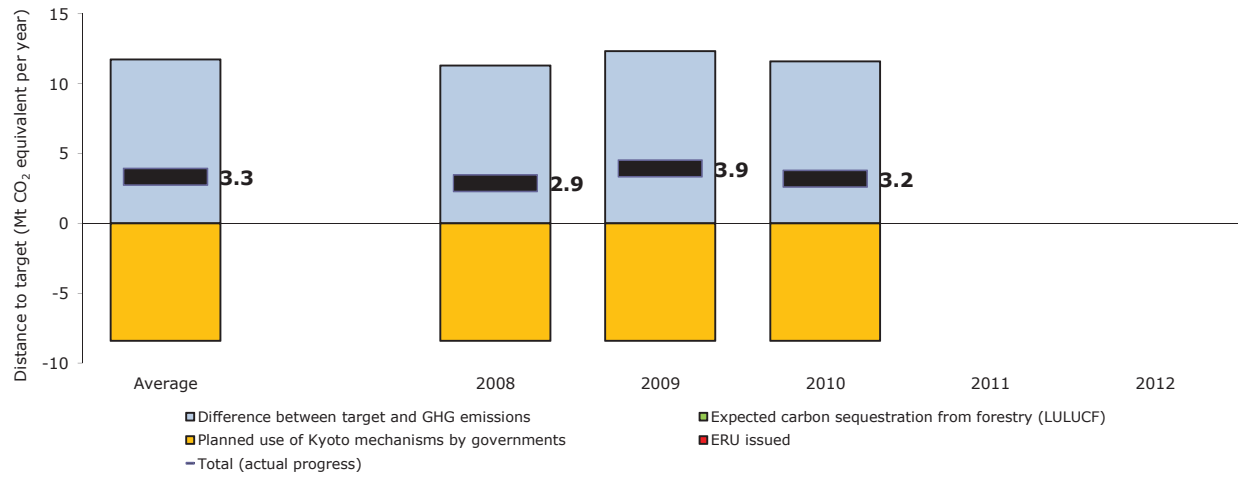


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Slovakia were 37.3 % lower than the base-year level, well below the Kyoto target of -8 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly lower than their respective target, by an amount equivalent to 16.3 % the country's base-year emissions. Slovakia intends to use the flexible mechanisms at government level by selling an amount of Kyoto units equivalent to 11.7 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Slovakia were standing below their target level, by a gap representing 4.6 % of the base-year emissions. Slovakia was therefore on track towards its Kyoto target by the end of 2010.



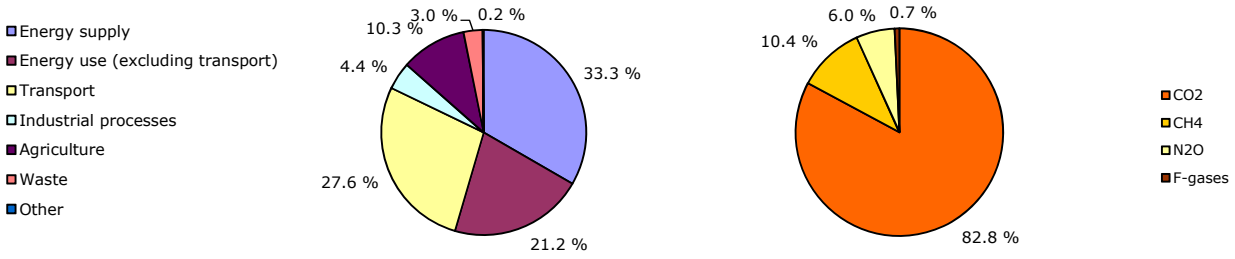
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Slovenia

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	18.5	21.3	19.3	19.7	Mt CO_2-eq.	22	n.a.
GHG from international bunkers ([4])	0.1	0.3	0.2	n.a.	Mt CO_2-eq.	26	n.a.
GHG per capita	9.3	10.6	9.5	9.6	t CO_2-eq. / capita	14	n.a.
GHG per GDP (constant prices) ([5])	1 036	706	698	703	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	0.3 %	0.4 %	0.4 %	0.4 %	%		
EU ETS verified emissions - all installations ([6])		8.9	8.1	8.1	Mt CO_2-eq.	22	n.a.
EU ETS verified emissions - constant scope ([7])		8.9	8.1	8.1	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		41.6 %	41.7 %	41.3 %	%		
ETS verified emissions compared to annual allowances ([8])		7.9 %	– 1.8 %	– 1.0 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 (2)		2009–2010 (2)	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	0.9	4.7 %	– 1.9	– 9.1 %	1.2	6.6 %	0.4	1.8 %
GHG per capita	0.3	2.8 %	– 1.1	– 10.1 %	0.4	3.9 %	0.1	1.1 %
EU ETS verified emissions - all installations ([6])			– 0.8	– 9.0 %			0.1	0.8 %
EU ETS verified emissions - constant scope ([7])			– 0.8	– 9.0 %			– 0.8	– 9.0 %

Assessment of long-term GHG trend (1990–2009)

The continuous increase in emissions between the early 1990s and 2008 is mainly caused by rising road transport demand and, to a lesser extent, by increasing electricity and heat demand, higher consumption of HFCs and larger CH4 emissions from solid waste disposal sites. Decreases have been observed in fuel combustion in manufacturing industries and construction, metal industry, particularly aluminium production and in the agricultural sector (mainly manure management).

Assessment of short-term GHG trend (2008–2009)

The economic downturn was responsible for the first (and significant) drop in emissions since 2003. It was reflected by decreases in fuel combustion. The largest decrease of GHG emissions took place in road transport, followed by decreases in fuel use by manufacturing industries and for the production of public electricity and heat. Process-related emissions from mineral and metal production also declined. The increase in renewables also contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on EEA estimate of 2010 emissions.

([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

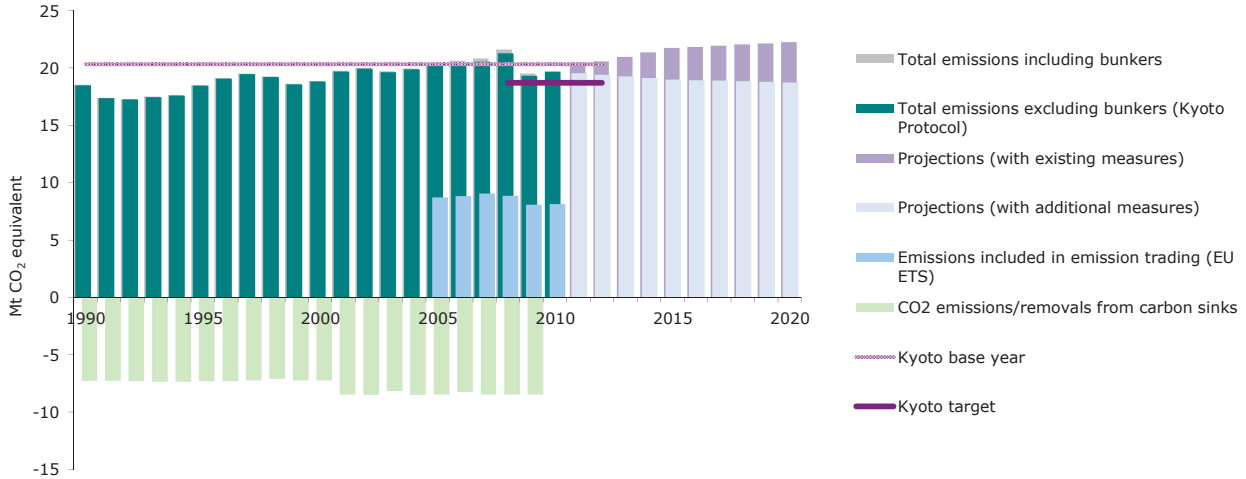
([6]) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

([7]) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

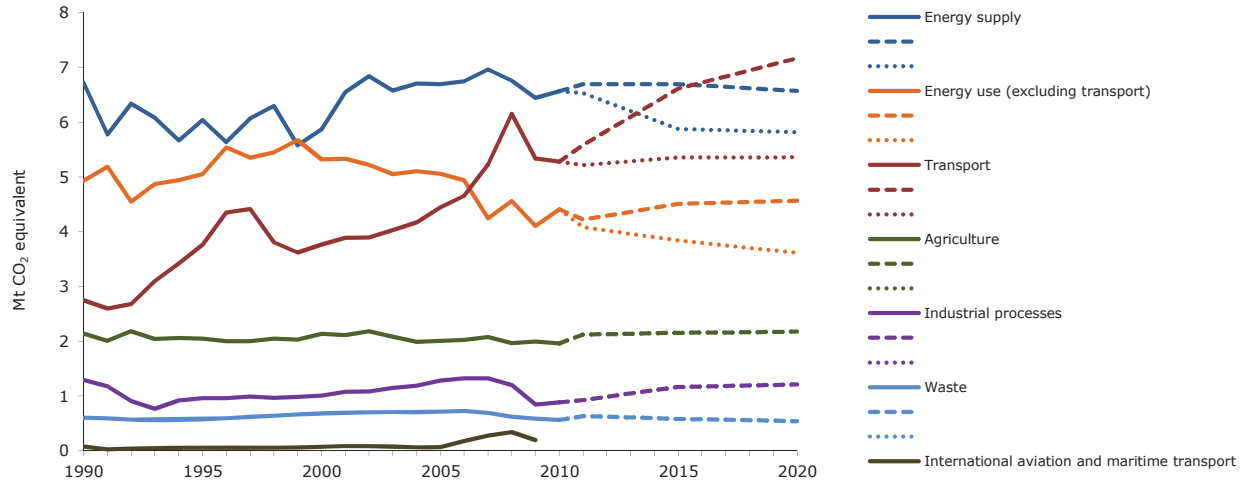
([8]) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

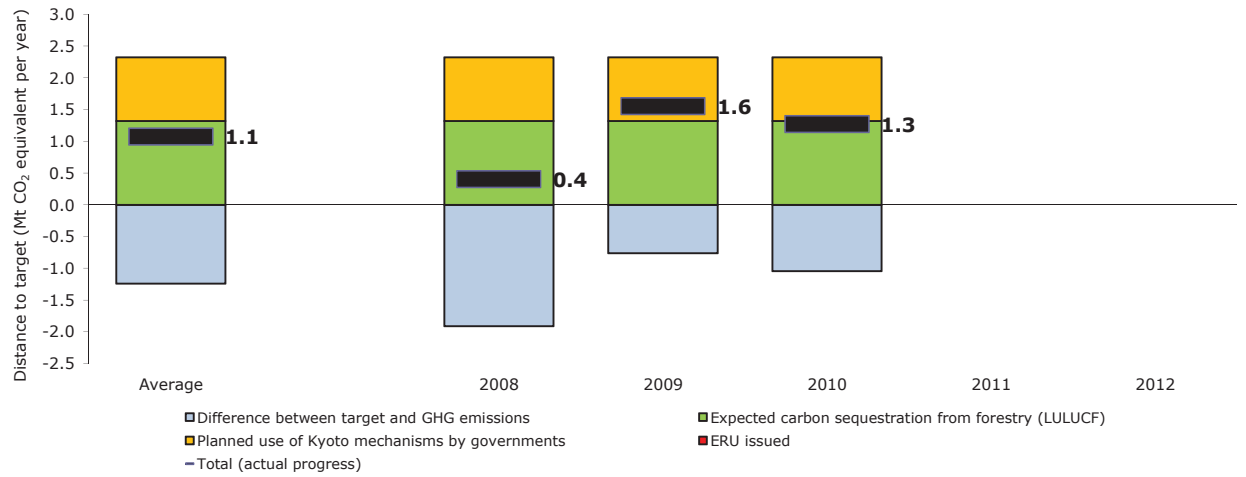


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Slovenia were 1.2 % lower than the base-year level, significantly above the Kyoto target of -8 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly higher than their respective target, by an amount equivalent to 6.1 % the country's base-year emissions. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 6.5 % of base-year level emissions. Slovenia intends to use the flexible mechanisms at government level by acquiring an amount of Kyoto units equivalent to 4.9 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Slovenia were standing below their target level, by a gap representing 5.3 % of the base-year emissions. Slovenia was therefore on track towards its Kyoto target by the end of 2010.



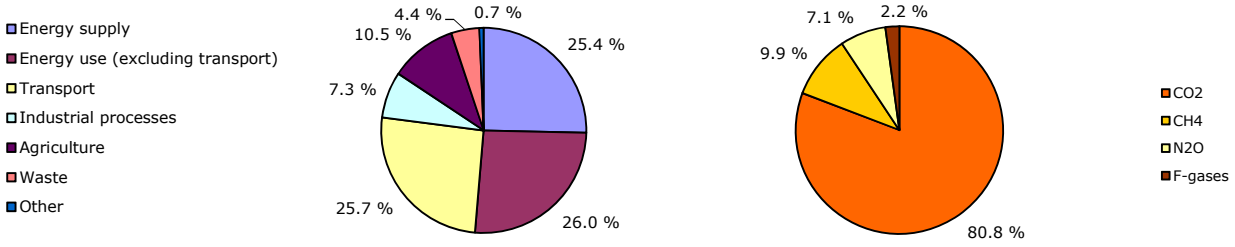
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Spain

European Environment Agency

Key GHG data (1)	1990	2008	2009	2010 (2)	Unit	Rank in EU-27 (3)	Rank in EU-15 (3)
Total greenhouse gas emissions (GHG)	283.2	404.8	367.5	353.9	Mt CO_2-eq.	6	5
GHG from international bunkers (4)	17.3	41.8	40.6	n.a.	Mt CO_2-eq.	3	3
GHG per capita	7.3	8.9	8.0	7.7	t CO_2-eq. / capita	18	13
GHG per GDP (constant prices) (5)	592	503	475	458	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	5.1 %	8.1 %	8.0 %	7.5 %	%		
EU ETS verified emissions - all installations (6)		163.5	136.9	121.5	Mt CO_2-eq.	5	4
EU ETS verified emissions - constant scope (7)		163.4	136.7	120.4	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		40.4 %	37.3 %	34.3 %	%		
ETS verified emissions compared to annual allowances (8)		6.2 %	– 9.1 %	– 19.1 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 (1) (9)



Key GHG trends	1990–2009		2008–2009		1990–2010 (2)		2009–2010 (2)	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	84.4	29.8 %	– 37.2	– 9.2 %	70.8	25.0 %	– 13.6	– 3.7 %
GHG per capita	0.7	10.0 %	– 0.9	– 10.3 %	0.4	5.5 %	– 0.3	– 4.0 %
EU ETS verified emissions - all installations (6)			– 26.5	– 16.2 %			– 15.4	– 11.3 %
EU ETS verified emissions - constant scope (7)			– 26.6	– 16.3 %			– 26.6	– 16.3 %

Assessment of long-term GHG trend (1990–2009)

Emissions from all sectors increased between 1990 and 2007, with the highest increases from energy use in transport, public electricity and heat production and fuel use in industry and households/services. The increase in emissions from industrial processes occurred mainly in the mineral industry and the consumption of halocarbons. Cement production increased by 70 % between 1993 and 2007 reflecting booming housing construction. In general, the two recent years 2008 and 2009 saw marked emission declines, particularly in 2009. The economic recession, mainly, and the growth in renewables were two key factors explaining the decrease in GHG emissions in 2009. In 2008, the main reasons for lower GHG emissions were less economic activity triggered by the start of the economic recession, less use of coal in electricity generation, more use gas and more use of renewable energy, as well as improved efficiency in the transformation of energy.

Assessment of short-term GHG trend (2008–2009)

The 5 % reduction in final electricity consumption and the increase in hydro and wind power electricity generation resulted in a marked decline of thermal power production, which led in turn to large emission decreases in the energy industry. The economic downturn was mainly reflected in emission decreases in industry (in particular cement production) and in the transport sector. Strong sustained growth in renewable energy also contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

(2) Based on national estimate of 2010 emissions.

(3) Comparison of 2009 values, 1 = highest value among EU countries.

(4) International bunkers: international aviation and international maritime transport.

(5) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

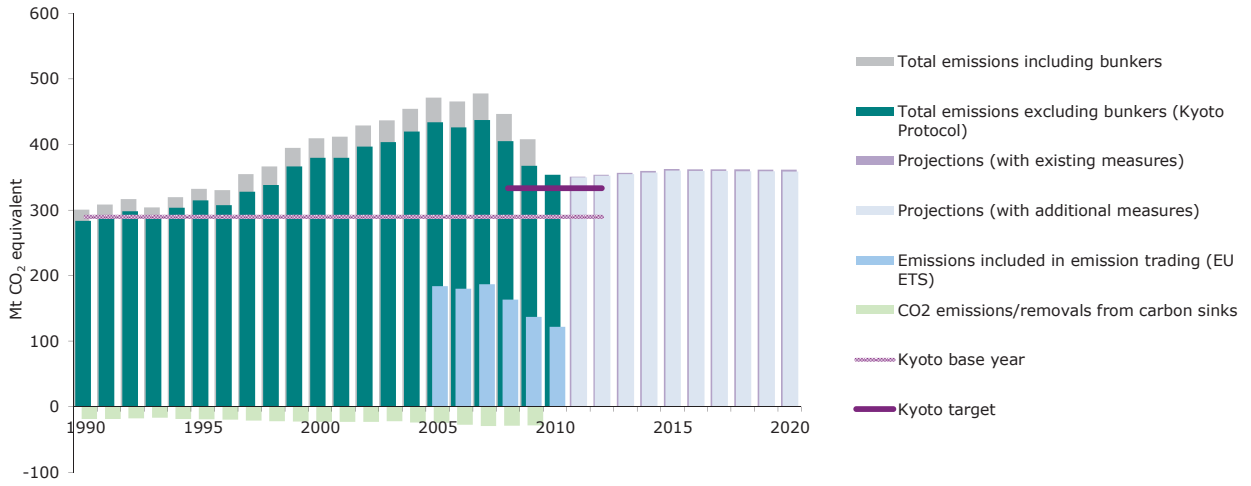
(6) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

(7) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

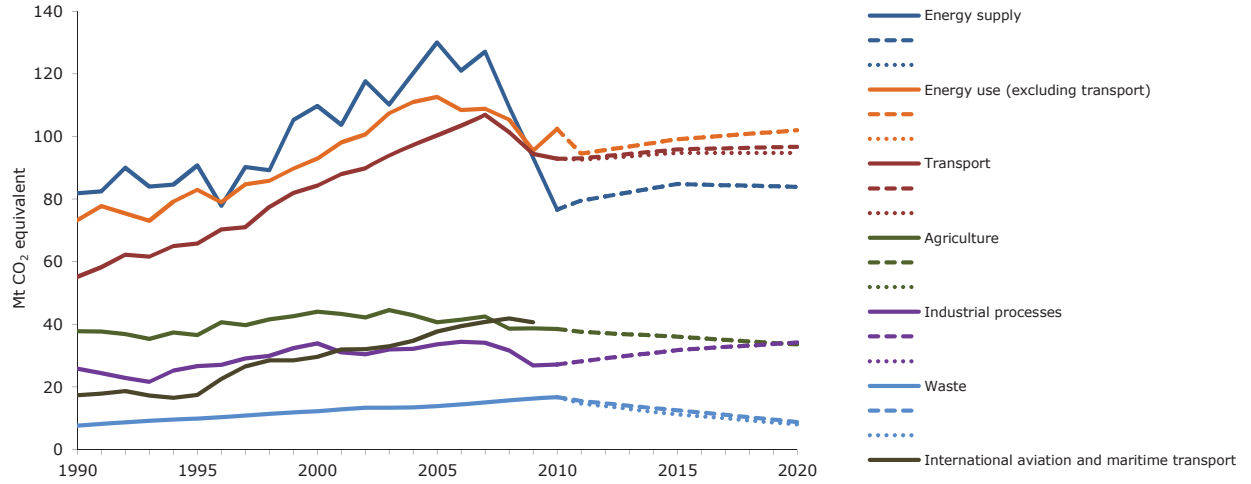
(8) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

(9) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

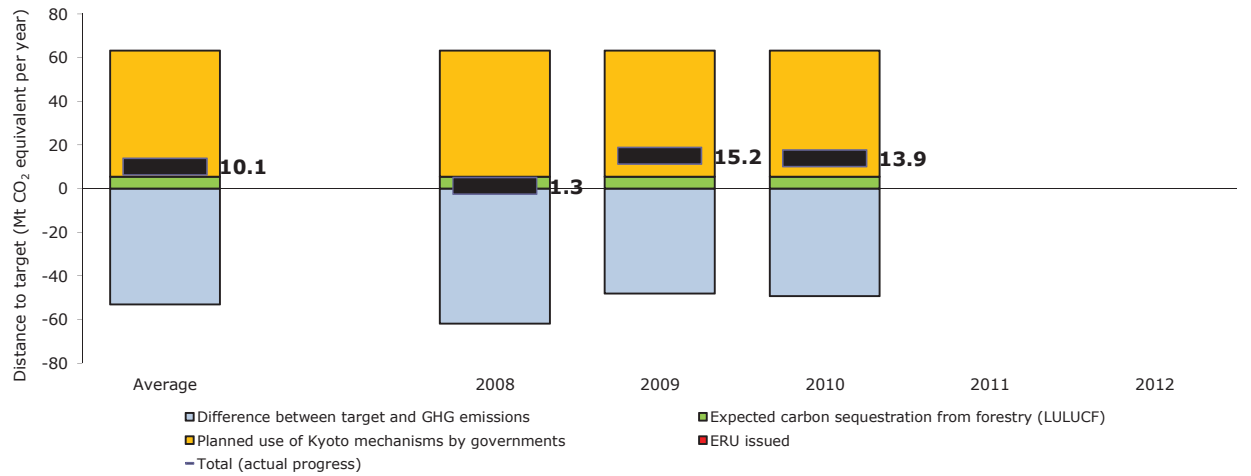


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Spain were 29.6 % higher than the base-year level, significantly above the burden-sharing target of 15 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly higher than their respective target, by an amount equivalent to 18.3 % the country's base-year emissions. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 1.9 % of base-year level emissions. Spain intends to use the flexible mechanisms at government level by acquiring an amount of Kyoto units equivalent to 19.9 % of base-year emissions per year. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Spain were standing below their target level, by a gap representing 3.5 % of the base-year emissions. Spain was therefore on track towards its burden-sharing target by the end of 2010.



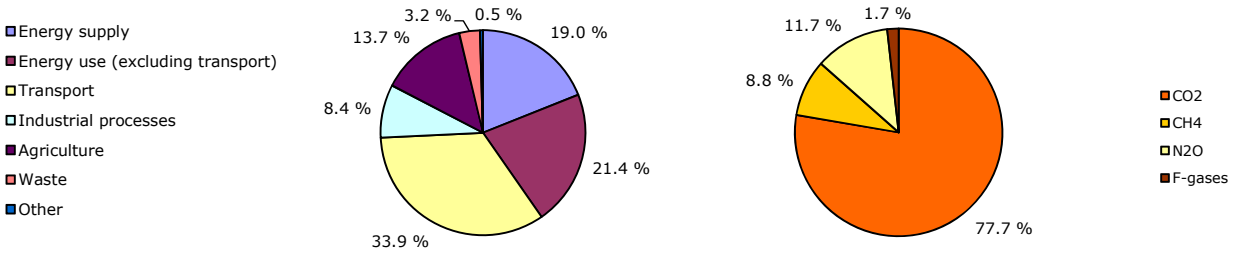
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Sweden

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	72.5	63.6	60.0	64.4	Mt CO_2-eq.	18	14
GHG from international bunkers ([4])	3.6	9.5	9.4	n.a.	Mt CO_2-eq.	9	9
GHG per capita	8.5	6.9	6.5	6.9	t CO_2-eq. / capita	24	15
GHG per GDP (constant prices) ([5])	332	194	193	197	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	1.3 %	1.3 %	1.3 %	1.4 %	%		
EU ETS verified emissions - all installations ([6])		20.1	17.5	22.7	Mt CO_2-eq.	19	13
EU ETS verified emissions - constant scope ([7])		20.0	17.5	22.6	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		31.6 %	29.1 %	35.2 %	%		
ETS verified emissions compared to annual allowances ([8])		– 3.4 %	– 17.2 %	– 3.7 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 12.5	– 17.2 %	– 3.6	– 5.6 %	– 8.1	– 11.1 %	4.4	7.4 %
GHG per capita	– 2.0	– 23.8 %	– 0.4	– 6.4 %	– 1.6	– 18.9 %	0.4	6.4 %
EU ETS verified emissions - all installations ([6])			– 2.6	– 12.9 %			5.2	29.6 %
EU ETS verified emissions - constant scope ([7])			– 2.6	– 12.8 %			– 2.6	– 12.8 %

Assessment of long-term GHG trend (1990–2009)

The large overall decrease is principally due to the declining use of oil for heating in the residential and service sector and its replacement principally by district heating, based on biomass fuels. Transport emissions increased overall between the early 1990s and 2005, but they have been stabilised and even reduced since. Emissions from industrial processes primarily derive from production of iron and steel and the mineral industry. Since 1990, total emissions in this sector have reflected the variations of production volumes with economic cycles. Having dropped by 26 % in 2009 compared to 2008, emissions from industrial processes were 20 % lower than in 1990. Emissions from agriculture decreased, mainly due to reduced livestock husbandry. The collection of landfill gas, a ban on landfill deposit and the introduction of a landfill tax have played a key role for the decrease in emissions from waste.

Assessment of short-term GHG trend (2008–2009)

Emissions decreased mainly in industry, in particular the iron and steel industry, reflecting a decline in steel production of almost 50 %. Emissions from cement production and from road transport also declined, reflecting the economic downturn. The small increase in renewables partly contributed to lower GHG emissions in 2009.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on EEA estimate of 2010 emissions.

([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

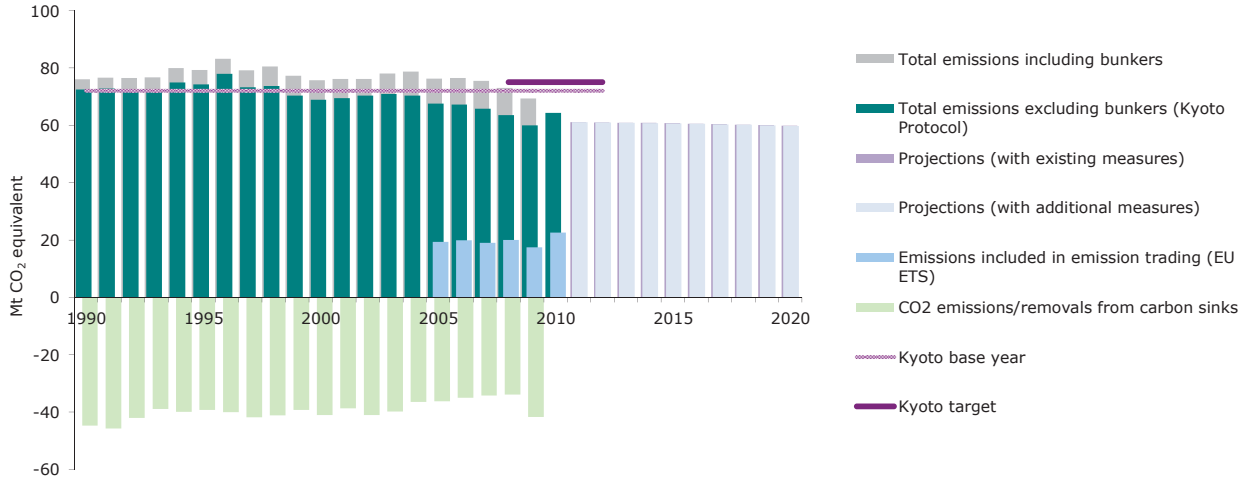
([6]) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

([7]) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

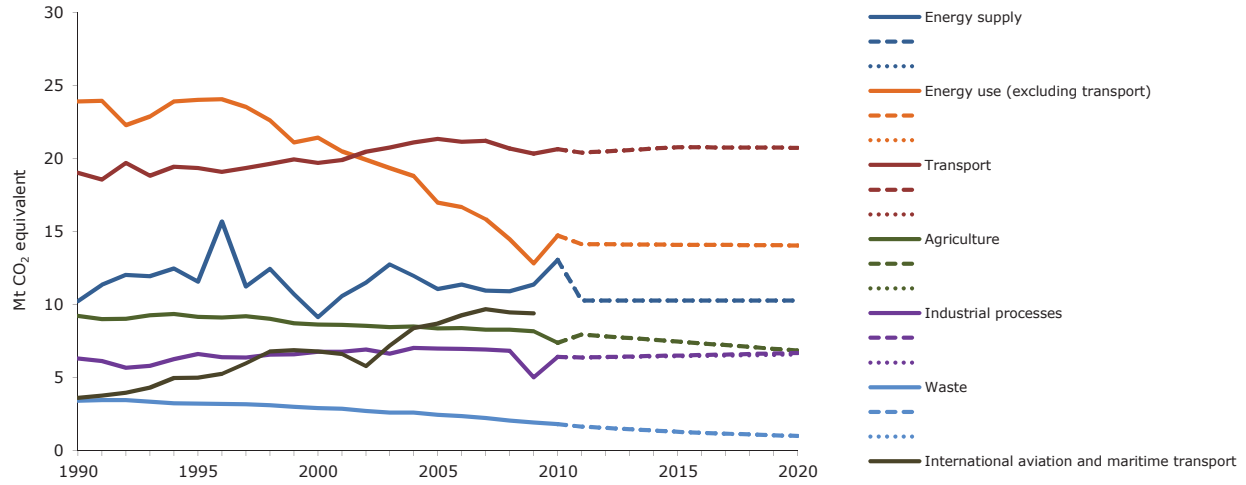
([8]) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

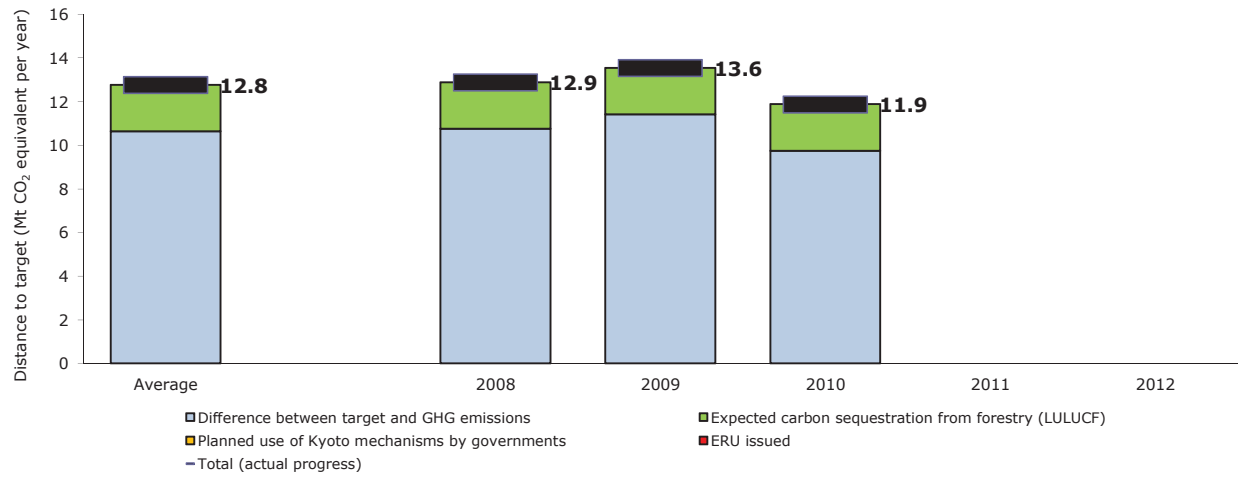


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in Sweden were 13.2 % lower than the base-year level, well below the burden-sharing target of 4 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly lower than their respective target, by an amount equivalent to 14.8 % the country's base-year emissions. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 3 % of base-year level emissions. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in Sweden were standing below their target level, by a gap representing 17.7 % of the base-year emissions. Sweden was therefore on track towards its burden-sharing target by the end of 2010.



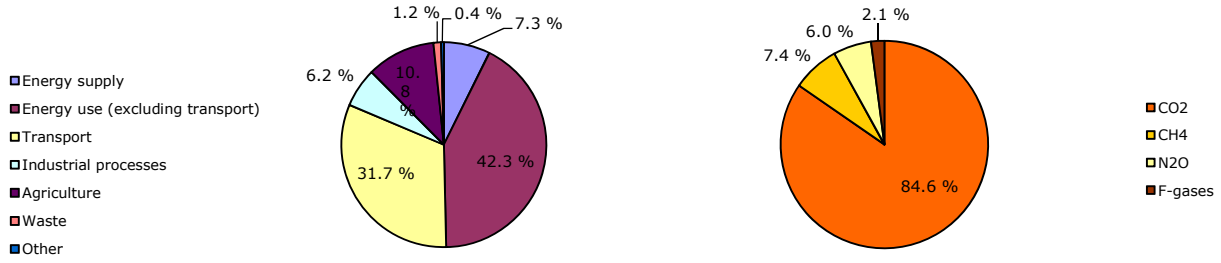
Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

GHG trends and projections in Switzerland

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	53.1	53.4	51.9	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG from international bunkers ([4])	3.2	4.3	4.1	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG per capita	8.0	7.0	6.7	n.a.	t CO_2-eq. / capita	n.a.	n.a.
GHG per GDP (constant prices) ([5])	218	169	167	0	g CO_2-eq. / euro		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 ([2])		2009–2010 ([2])	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 1.2	– 2.2 %	– 1.5	– 2.8 %	n.a.	n.a.	n.a.	n.a.
GHG per capita	– 1.2	– 15.3 %	– 0.3	– 4.2 %	n.a.	n.a.	n.a.	n.a.

Assessment of long-term GHG trend (1990–2009)

Despite clear trends in some GHG emissions, there is no significant trend in the total emissions of the period 1990–2009. Year-to-year variations of total emissions are mainly caused by changing winter temperatures and their effect on CO2 emissions from fuel combustion. With about 95.1 % of electricity generated by hydroelectric and nuclear power plants in 2008, emissions from energy supply are relatively limited. Overall, energy-related emissions remained relatively constant. Emissions from transport increased in fairly strong correlation with economic development. CO2 emissions from the residential sector are strongly correlated with winter climatic conditions. Increases in the number of buildings and apartments and in the average floor space per person and workplace led to an increase in the total area heated, compensated by the specification of higher standards for insulation and for combustion equipment efficiency for both new and renovated buildings. Declining populations of cattle and swine and reduced fertilizer use have led to a decrease in emissions from agriculture until 2004. Since then, CH4 emissions slightly increased again due to higher livestock numbers, mainly cattle. Total emissions from waste management decreased steadily throughout the period 1990–2003. Since 2000, emissions have been reduced further by a ban on the disposal of combustible municipal solid wastes on landfills been banned. However this reduction was offset due to more municipal solid waste being incinerated.

Assessment of short-term GHG trend (2008–2009)

Emissions decreased in 2008 and returned to their 2007 level. Reduced energy used by the industry, households and the tertiary sector, likely due to the economic recession, resulted in lower energy-related emissions. A decline in process-related emissions was also observed, in particular in the mineral industry.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on EEA estimate of 2010 emissions.

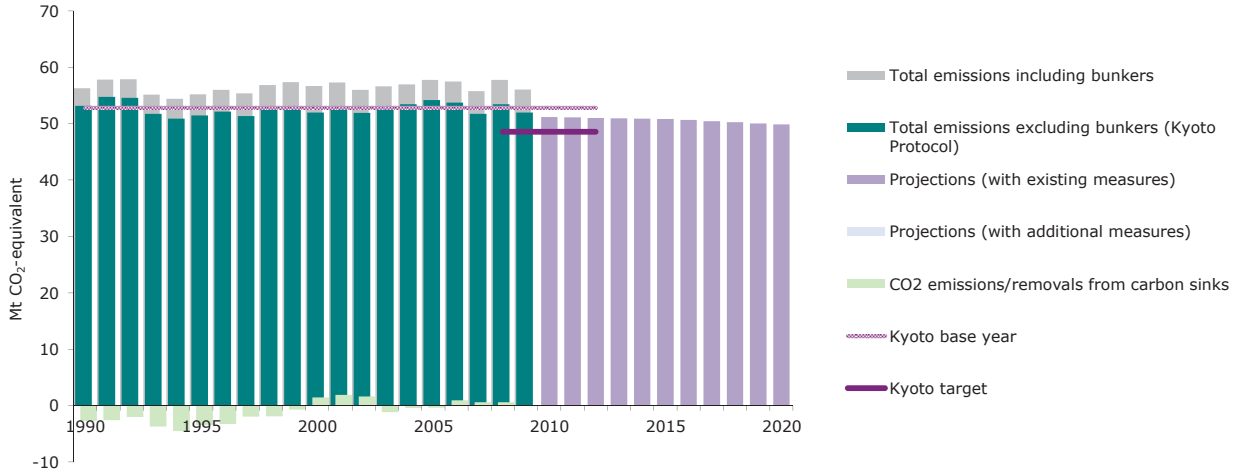
([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

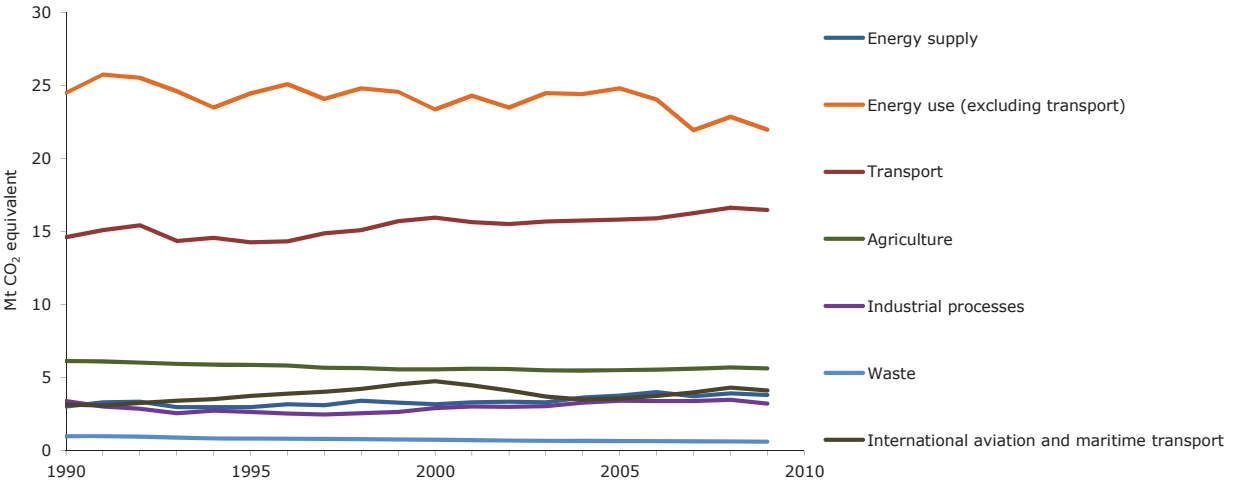
([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



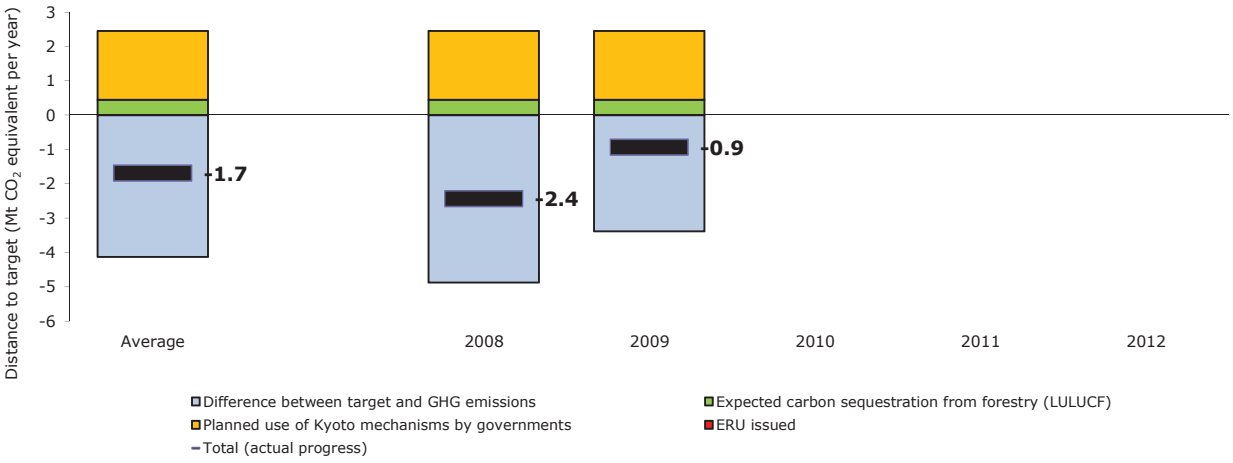
GHG trends 1990–2009 - emissions by sector



Source: National GHG inventory, 2011. See: http://dataservice.eea.europa.eu/PivotApp/pivot.aspx?pivotid=475

Progress towards Kyoto target

Average 2008–2009 emissions in Switzerland were 0.2 % lower than the base-year level, significantly above the Kyoto target of -8 % for the period 2008–2012. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 0.9 % of base-year level emissions. Switzerland intends to use the flexible mechanisms at government level by acquiring an amount of Kyoto units equivalent to 3.8 % of base-year emissions per year. Taking all these effects in to account, average emissions Switzerland were standing above their target level, by a gap representing 3.2 % of the base-year emissions. Switzerland was therefore not on track towards its Kyoto target by the end of 2009. Based on these actual 2008–2009 emissions and on projections for the remaining years of the first commitment period, the Swiss government decided on 10 June 2011 to increase its use of flexible mechanisms over the full commitment period to meet its Kyoto target .



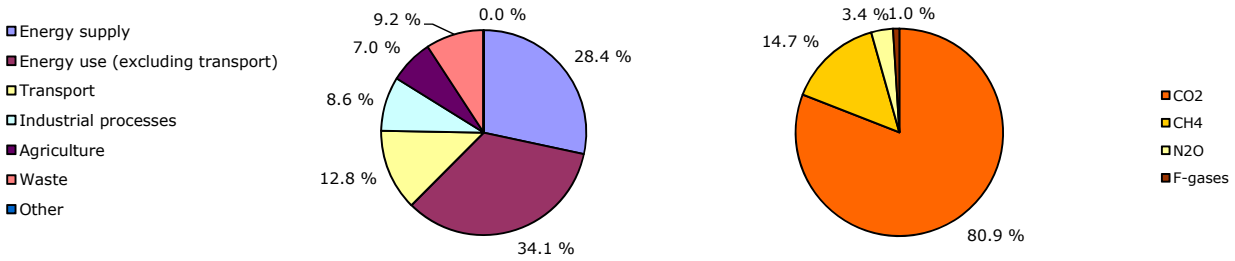
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Turkey

European Environment Agency

Key GHG data (1)	1990	2008	2009	2010 (2)	Unit	Rank in EU-27 (3)	Rank in EU-15 (3)
Total greenhouse gas emissions (GHG)	187.0	366.5	369.6	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG from international bunkers (4)	n.a.	2.4	2.0	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG per capita	3.4	5.2	5.2	n.a.	t CO_2-eq. / capita	n.a.	n.a.
GHG per GDP (constant prices) (5)	925	898	952	0	g CO_2-eq. / euro		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 (1) (9)



Key GHG trends	1990–2009		2008–2009		1990–2010 (2)		2009–2010 (2)	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	182.6	97.6 %	3.1	0.9 %	n.a.	n.a.	n.a.	n.a.
GHG per capita	1.8	53.4 %	– 0.0	– 0.5 %	n.a.	n.a.	n.a.	n.a.

Assessment of long-term GHG trend (1990–2009)

Emissions almost doubled between 1990 and 2007, increasing in all sectors except agriculture. The increase was driven by economic and demographic development, which resulted both in increasing energy demand and energy production. Turkey has the highest annual population growth of all European countries (+ 1.7 % population growth rate in 2005), but the lowest per capita greenhouse gas emissions in the region. Emissions in the non-energy sectors have remained relatively stable in the last decade.

Assessment of short-term GHG trend (2008–2009)

After a decrease in emissions in 2008, emissions picked up again in 2009, although at a more moderate rate than previously. Emissions increased in particular in the residential sector, as well as in the mineral industry (process-related emissions). At the same time, emissions from the production of electricity and heat decreased, along with process-related emissions from the chemical industry.

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

(2) Based on EEA estimate of 2010 emissions.

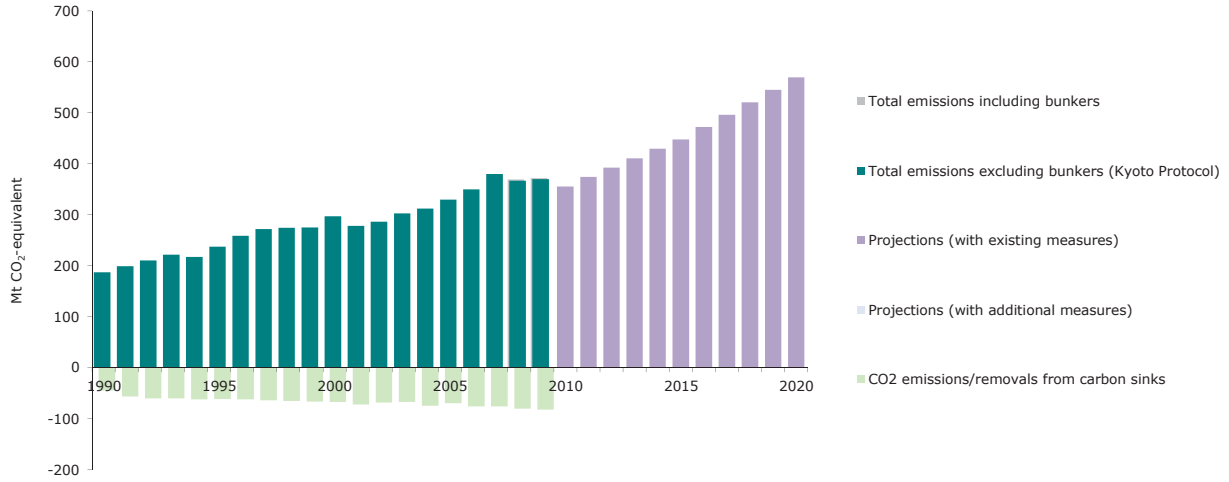
(3) Comparison of 2009 values, 1 = highest value among EU countries.

(4) International bunkers: international aviation and international maritime transport.

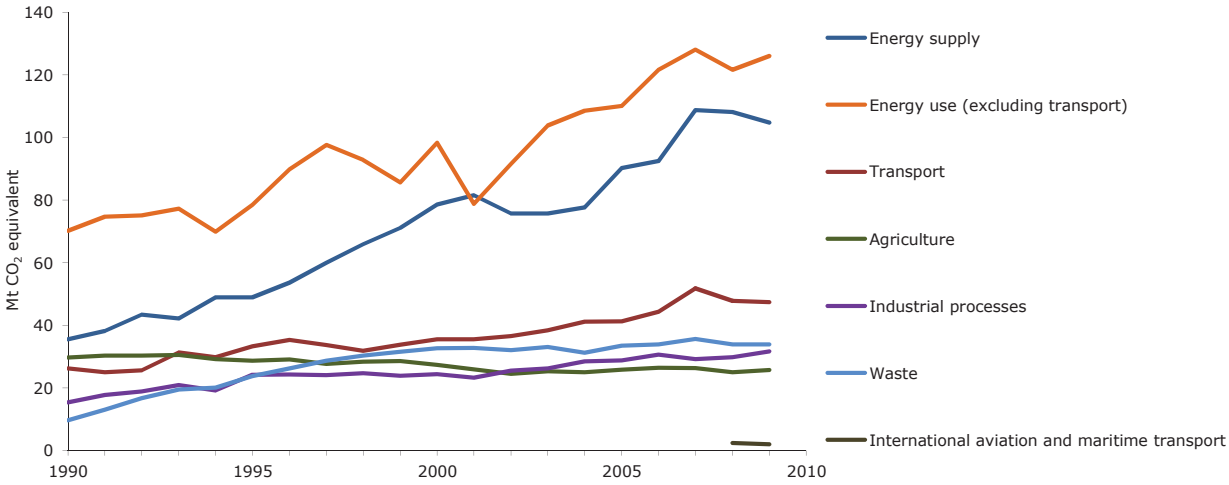
(5) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

(9) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends 1990–2009 - emissions by sector



Source: National GHG inventory, 2011. See: http://dataservice.eea.europa.eu/PivotApp/pivot.aspx?pivotid=475

Progress towards Kyoto target

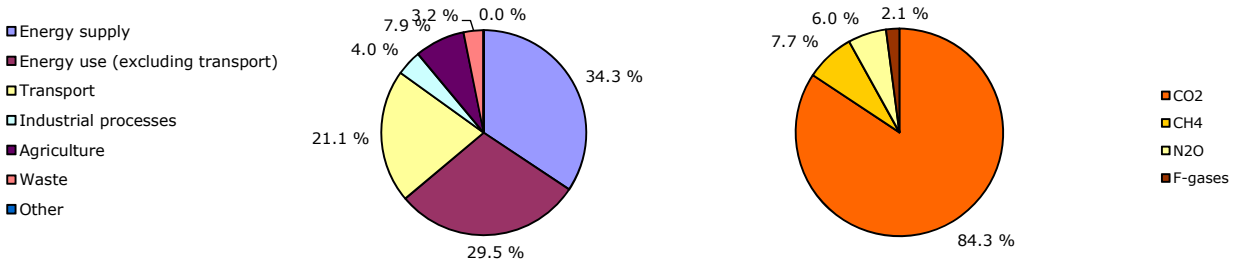
Turkey does not have a target under the Kyoto Protocol.

GHG trends and projections in the United Kingdom

European Environment Agency

Key GHG data ([1])	1990	2008	2009	2010 ([2])	Unit	Rank in EU-27 ([3])	Rank in EU-15 ([3])
Total greenhouse gas emissions (GHG)	776.1	620.3	566.2	584.5	Mt CO_2-eq.	2	2
GHG from international bunkers ([4])	25.0	46.1	43.9	n.a.	Mt CO_2-eq.	2	2
GHG per capita	13.6	10.1	9.2	9.4	t CO_2-eq. / capita	15	10
GHG per GDP (constant prices) ([5])	622	324	311	317	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	13.9 %	12.5 %	12.3 %	12.4 %	%		
EU ETS verified emissions - all installations ([6])		265.1	232.0	237.4	Mt CO_2-eq.	2	2
EU ETS verified emissions - constant scope ([7])		264.9	231.7	236.9	Mt CO_2-eq.		
Share of EU ETS verified emissions (all installations) in total GHG		42.7 %	41.0 %	40.6 %	%		
ETS verified emissions compared to annual allowances ([8])		21.4 %	– 4.3 %	– 7.4 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2009 ([1]) ([9])



Key GHG trends	1990–2009		2008–2009		1990–2010 (2)		2009–2010 (2)	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 209.9	– 27.0 %	– 54.0	– 8.7 %	– 191.6	– 24.7 %	18.3	3.2 %
GHG per capita	– 4.4	– 32.3 %	– 0.9	– 9.3 %	– 4.2	– 30.6 %	0.2	2.5 %
EU ETS verified emissions - all installations ([6])			– 33.1	– 12.5 %			5.5	2.4 %
EU ETS verified emissions - constant scope ([7])			– 33.2	– 12.5 %			– 33.2	– 12.5 %

Assessment of long-term GHG trend (1990–2009)

Emissions have decreased in all main sectors since the early 1990s. Significant emission reductions were achieved in the energy sector, due to fuel switching from coal to gas, and reduced energy intensity of the economy. Emissions from transport increased steadily until 2007 and declined in 2008 and 2009. Emissions from the agriculture sector have decreased by 21 % since 1990, reflecting trends in livestock numbers and reduced fertilizer application. Emissions from the industrial sector have decreased, in particular in the chemical industry (mainly due to plant closures and abatement measures in nitric acid production, adipic acid production and fluorinated gas manufacture) and in the metal processing industries. Overall, emissions from the waste sector decreased by 70 %, mostly due to the implementation of CH4 recovery systems at landfill sites, and reductions in the amount of waste disposed of at landfill sites.

Assessment of short-term GHG trend (2008–2009)

Declining electricity demand, increased output from nuclear power plants and a continued shift in thermal power production from coal to gas resulted in a strong decrease in emissions from public electricity and heat production (for the first time in 2009, more gas than coal was used to produce public electricity and heat).

Source and additional information

Greenhouse gas emission data and EU ETS data www.eea.europa.eu/themes/climate/data-viewers

(1) Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

([2]) Based on national estimate of 2010 emissions.

([3]) Comparison of 2009 values, 1 = highest value among EU countries.

([4]) International bunkers: international aviation and international maritime transport.

([5]) GDP in constant 2000 prices - not suitable for a ranking or quantitative comparison between countries for the same year. 1990 information not available for some countries, replaced by later years: 1991 (Bulgaria, Germany, Hungary and Malta), 1992 (Slovakia), 1993 (Estonia) and 1995 (Croatia). Source GDP: Eurostat, 2011; Ameco database, 2011.

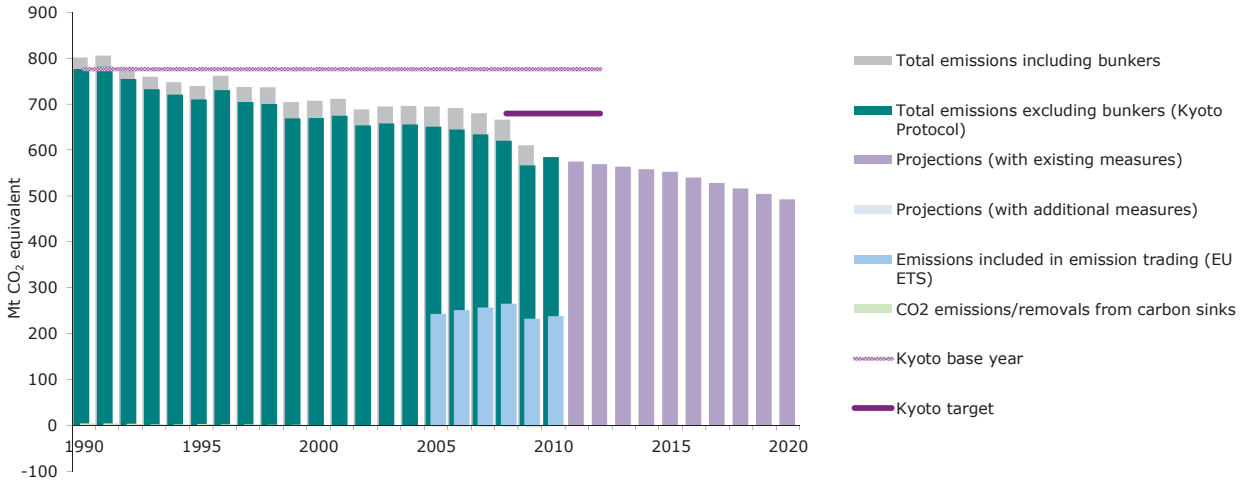
([6]) All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) as of 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007, 17 May 2010 for the reporting year 2008 and 23 May for the reporting years 2009 and 2010. The CITL regularly receives new information (including delayed verified emissions data, new entrants and closures) so the figures shown may change over time.

([7]) Constant scope: includes only those installations with verified emissions available for 2008, 2009 and 2010.

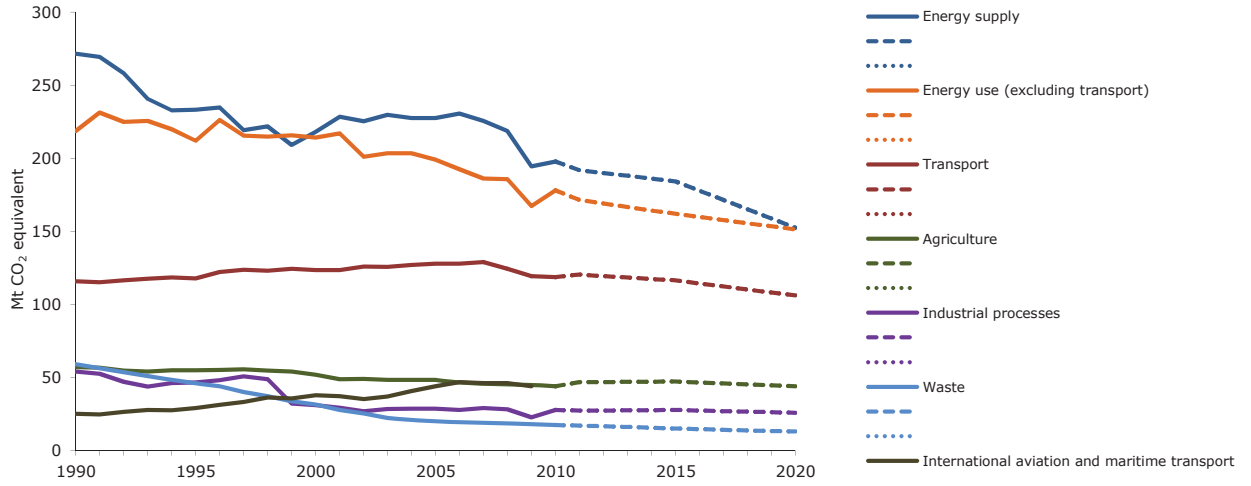
([8]) "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

([9]) LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums may not necessarily add up.

GHG trends and projections 1990–2020 — total emissions



GHG trends and projections 1990–2020 — emissions by sector

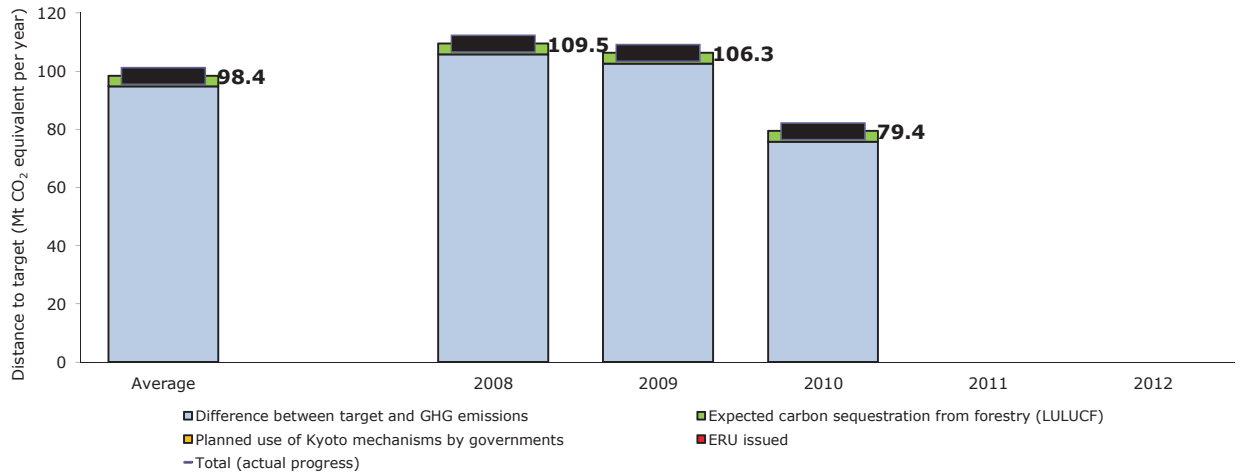


Note: GHG emission projections are represent either through dashed lines (with existing measures) or dotted lines (additional measures).

Source: National inventory, 2011; EEA proxy estimate; 2011; national projection data.

Progress towards Kyoto target

Average 2008–2010 emissions in United Kingdom were 24 % lower than the base-year level, well below the burden-sharing target of -12.5 % for the period 2008–2012. In the sectors not covered by the EU ETS, emissions were significantly lower than their respective target, by an amount equivalent to 12.2 % the country's base-year emissions. LULUCF activities are expected to decrease net emissions by an annual amount equivalent to 0.5 % of base-year level emissions. Taking all these effects in to account, average emissions in the sectors not covered by the EU ETS in United Kingdom were standing below their target level, by a gap representing 12.7 % of the base-year emissions. The United Kingdom was therefore on track towards its burden-sharing target by the end of 2010.



Note: The difference between target and GHG emissions concerns the sectors not covered by the EU ETS. A positive value indicates emissions lower than the average target.

European Environment Agency

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