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Tracking progress towards Kyoto and 2020 targets in Europe

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European Environment Agency

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Executive summary

This report presents an overview of the progress achieved so far by the EU, its Member States and other EEA member countries towards their respective targets under the Kyoto Protocol and the EU burden-sharing agreement. The assessment is based on greenhouse gas (GHG) emission data in Europe for 2008, the first year of the Kyoto Protocol's first commitment period which runs from 2008 to 2012. The recent availability of 2009 emissions estimates for the EU and a limited number of countries broadens, in these cases, the basis of the assessment to two years of the five-year commitment period.

Current emission levels and projections show that the EU is well on track to achieve its 2020 reduction target of 20 % with domestic emission reductions only, provided that Member States fully implement the EU climate and energy package adopted in 2009.

The EU-27 has committed 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 other major emitting countries agree to similar targets. Based on recent EEA estimates, EU-27 GHG emissions in 2009 decreased by 6.9 % compared to 2008. They stood in 2009 approximately 17.3 % below the 1990 level and therefore very close to the 20 % emission reduction target.

Although it can be expected that recent emission reductions will level off or even be reversed temporarily as the economy picks up again, projections from the European Commission show that the EU-27 is expected to achieve its 20 % reduction commitment by 2020 through domestic action alone, provided that Member States fully implement the climate and energy package.

The EU-15 is also well on track to achieve its commitment under the Kyoto Protocol of reducing emissions by 8 % compared to base year levels. This result relies on the assumption — which cannot be taken for granted — that certain Member States will exceed their target and cover any shortfall in other Member States. In fact, failure by any EU-15 Member State to meet its own burden-sharing target would jeopardise the possibility of the EU-15 achieving its common target.

Under the Kyoto Protocol, the EU-15 has committed to a common emission reduction target of 8 % compared to base-year levels, to be achieved over a five-year commitment period from 2008 to 2012. Based on recent EEA estimates, 2009 emissions in the EU-15 were 6.9 % lower than in 2008. As a result, EU-15 average emissions for 2008 and 2009 (the two first years of the commitment period) were lower than the EU-15 emission target by 94 Mt CO_2-equivalent per year (2.2 % of base-year emissions). This overachievement at EU-15 level increases to more than 253 Mt CO_2-equivalent per year (5.9 % of base year emissions) when two factors are taken into account:

- governments' planned net annual acquisition of emissions units through the Kyoto Protocol's flexible mechanisms in order to comply with their targets in sectors not covered by the EU emission trading scheme (EU ETS) for the whole commitment period (117 million units per year or 2.7 % of base year emissions);
- expected annual carbon sequestration from LULUCF activities (42 Mt CO_2 per year or 1.0 % of base-year emissions).

Despite possible short-term increases in European emissions subsequent to economic recovery, European Commission projections show that over the full commitment period 2008–2012 the EU-15's aggregated emissions will stay well below its Kyoto target with the current policies in place.

Nevertheless, further efforts are necessary from Member States to guarantee that the EU-15 achieves its commitment under the Kyoto Protocol. The EEA analysis of current emission levels in the EU-15 shows that shortfalls currently exist in Austria, Denmark and Italy. These three countries therefore need to step up their efforts by achieving further emission reductions in sectors not covered by the EU ETS or by revising upwards their current

plans on using flexible mechanisms at government level. Shortfalls can be offset using the flexible mechanisms through transfers from Member States that exceed their targets. Such transfers should not be taken for granted, however, because any Member State has the right to retain or cancel (i.e. not make available to other EU Member States) any surplus compliance unit by the end of the commitment period.

Most European countries with a Kyoto target were on track towards their individual target in 2008, based on their emission levels that year. However in three EU Member States (Austria, Denmark and Italy), two other EEA countries (Liechtenstein and Switzerland) and one EU candidate country (Croatia), emissions stayed above their limits in 2008 despite planned use of flexible mechanisms and expected carbon removals from LULUCF activities over the full commitment period. 2009 emission estimates available from Denmark, Italy and Switzerland do not change this picture, despite the effect of the economic recession on GHG emissions. No 2009 information is available for Austria, Croatia and Liechtenstein.

In 2008, 17 Member States, the EU-15 and Norway had reduced or limited their domestic GHG emissions to below their Kyoto target level (bearing in mind the allocation of a proportion of their respective budgets to the EU ETS). The other countries (Austria, Croatia, Denmark, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Portugal, Slovenia, Spain and Switzerland) still had actual emission levels above their respective targets. When national plans to acquire emission credits through flexible mechanisms or to sequester carbon throughout the full commitment period are considered, five EU Member States and Iceland appear on track towards their target. However, the 2008 emission levels of three Member States (Austria, Denmark and Italy) as well as Croatia, Liechtenstein and Switzerland, remain above their respective emission budgets. At the end of 2008, Austria, Denmark and Italy together needed to fill a gap of 29 Mt CO_2-equivalent per year by the end of 2012 to guarantee that the EU-15 meets its Kyoto target.

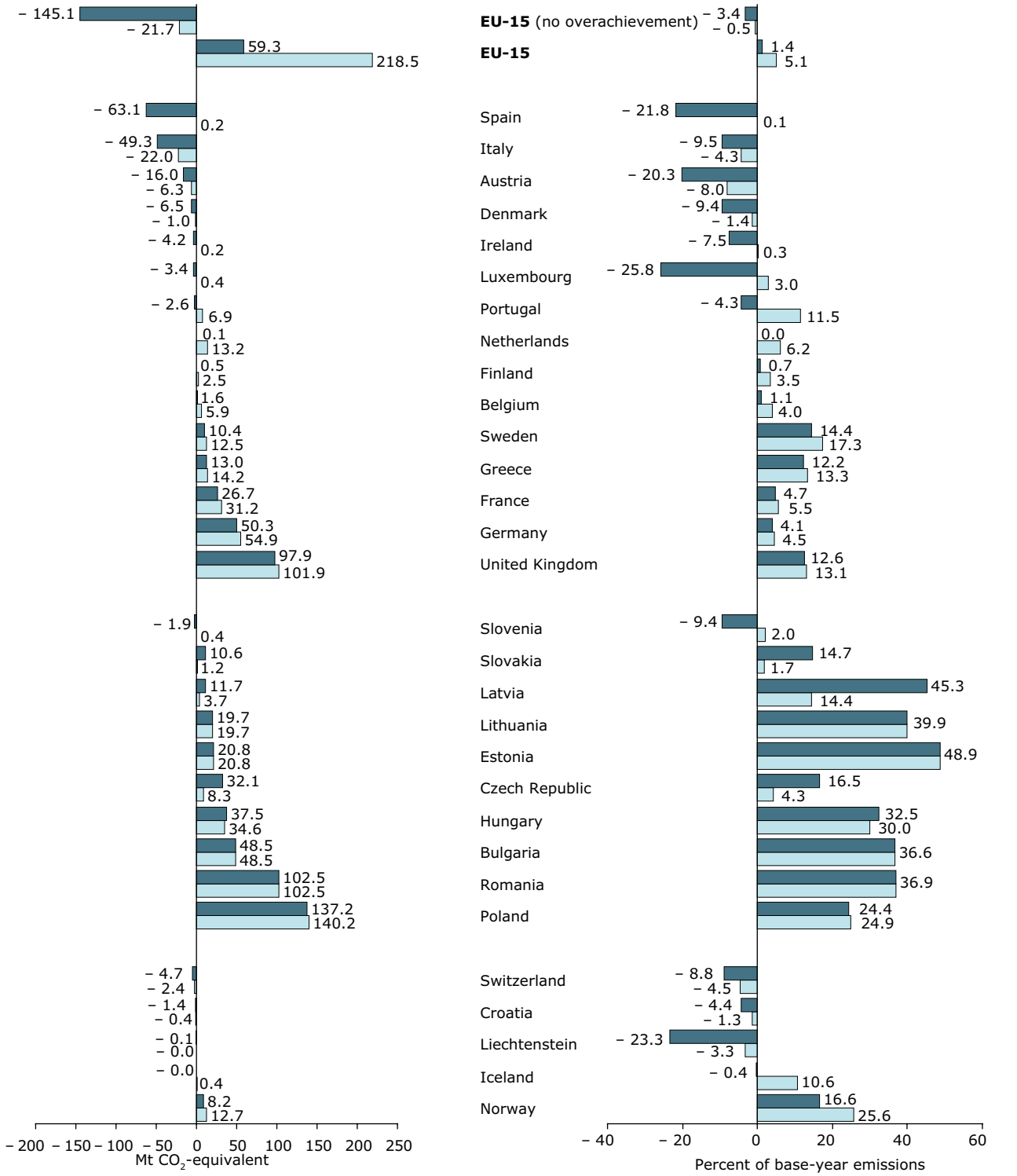
Estimates of 2009 GHG emissions are available for a third of the 32 EEA member countries (Denmark, Germany, Italy, Luxembourg, the Netherlands, Norway, Spain, Slovakia, Slovenia, Switzerland and the United Kingdom). These show that the actual progress of these countries towards their targets in 2009 did not change significantly compared to 2008. In particular, Denmark, Italy and Switzerland remain above their respective targets, despite their planned used of flexible mechanisms and carbon sink removals. In the case of Denmark, however, the gap to the target became quite small in 2009 and may fall within the uncertainty range. Furthermore, according to projections from that country and reported by the European Commission, Denmark expects to bridge its remaining gap through further emission reductions over the period 2010–2012 compared to 2008–2009 average levels. Similarly, Switzerland estimates that further emission reductions over the period 2010–2012 will close the remaining gap. No recent information on 2009 emissions in Austria, the third EU country above its target in 2008, is currently publicly available. Estimates of 2009 emissions in additional countries would provide a more complete and accurate picture of the overall situation in Europe in progressing towards the Kyoto targets.

The economic crisis, which resulted in significant reductions of total GHG emissions in 2009, had a somewhat smaller impact on progress towards Kyoto targets because emission reductions in the sectors not covered by the EU ETS were not as large as overall reductions. With caps set on emissions from sectors covered by the EU ETS, emissions from non-ETS sectors take on a special importance as they are the only ones that matter for the achievement of Kyoto targets by governments.

A country's progress towards its Kyoto target is determined by comparing its emissions with an emission budget set according to its commitment under the Kyoto Protocol (or the burden-sharing agreement in the case of EU-15 Member States). In order to keep its emissions lower than its emission budget, a country can either limit or reduce its emissions or increase its emission budget. The latter can be done by acquiring additional emission credits from other countries (use of the Kyoto flexible mechanisms) and by enhancing carbon sequestration through land use, land-use change and forestry (LULUCF) activities.

EU governments split their Kyoto emission budgets in two. A portion is allocated to the sectors covered by the EU ETS (primarily industrial installations). Total emissions from those sectors is capped under EU law and the distribution of abatement measures among sources is determined by market forces within the trading mechanism. The remainder of a country's budget is allocated to non-ETS sectors such as buildings, transport or agriculture. With emissions capped in the EU ETS sectors, it is only variations in emissions from non-ETS sectors that

Figure ES.1 Gap between emissions in 2008 and Kyoto targets with and without the use of flexible mechanisms by governments and carbon sinks



Note: For EU Member States, 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. A positive value indicates a country for which emissions in 2008 were lower than the annual target. EU-15 values are the sum of the gaps/surplus' for the 15 EU Member States which are part of the burden-sharing agreement. Member States with a surplus can use any remaining allowances for their own purposes and not necessarily to compensate for Member States with a gap. To take this into account, 'EU-15 (no overachievement)' is used to include the gaps to target without taking overachievement into account.

Source: EEA.

matter for the achievement of Kyoto targets by governments. For more on this topic, see Section 2.3 below.

Although the recent economic crisis did result in important emission reductions in the EU-27 in 2009 (– 6.9 % compared to 2008 for total emissions), these reductions were less important in the sectors not covered by the EU ETS (– 3.3 %) than in the trading sectors (– 11.7 %). The crisis helped Member States achieve their Kyoto targets only to the extent that it triggered further emission reductions in non-trading sectors. However, the additional emission reductions in sectors under the EU ETS have reduced the need for operators to use their emission allowances. These freed-up allowances can be sold on the carbon market or banked for future use, notably in the third trading period 2013–2020.

Figure ES.2 Decomposition of the progress towards Kyoto targets in 2008 and 2008–2009 for countries where 2009 proxy data are available

Note: A positive value indicates a country for which in 2008 the assigned amount was lower than the emissions.
Missing countries did not submit a proxy inventory for 2009 and did not agree to use the EEA estimate, or submitted a proxy inventory but did not agree on its publication.

Source: EEA.

1 Introduction

1.1 Objective and scope

This report presents an assessment of the progress achieved by the European Union (EU) and European countries towards achieving their GHG emission targets under the Kyoto Protocol and for 2020. It also presents a compilation of 'greenhouse gas profiles' for each EEA member country.

The report covers the geographical area represented by the 32 EEA member countries. It looks in detail at the situation of the European Union — as constituted of the 15 pre-2004 Member States and which has an overall 8 % reduction commitment under the Kyoto Protocol (EU-15), the 25 EU Member States with a Kyoto target, two EU candidate countries for which accession negotiations have been opened ([1]) (Croatia and Iceland), as well as 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 Kyoto Protocol and are therefore not covered by this report.

The report focuses essentially on the assessment of actual (current) progress of Member States towards their Kyoto or burden-sharing targets. It is based on historic emission data covering part of the first commitment period of the Kyoto Protocol 2008–2012. The assessment of current progress provides an indication of where all countries were standing at the end of 2008, compared to their emission reduction targets, but does not aim to predict whether a country will finally comply with its commitment or not. Adopting such an approach based on the tracking of real progress actually made by Member States during the commitment period, based mainly on historic data, is necessary to provide policymakers a clear indication of the further efforts required to achieve Kyoto objectives. Subsequently, a decreasing weight is given on short-term emission projections, which are subject to a larger degree of uncertainty than historic data.

However, on the accounting side (emission budgets), it was considered useful and relevant to take into account the planned use of flexible mechanisms and the carbon removals from land use, land-use change and forestry (LULUCF) activities expected by Member States for the whole commitment period, in order to account for likely changes in national emission budgets.

For the EU-15 and a limited number of countries, the availability of more recent emission data have made it possible to assess their status at the end of 2009, based on 2008–2009 average emissions.

Finally, the report also presents an assessment of the progress projected for the EU by the end of the first commitment period and by 2020, based mostly on projections prepared by the European Commission ([2]).

The report also supports and complements the assessment by the European Commission of progress of the EU and its Member States towards their targets, based mostly on Commission projections for 2009–2012 and published in the 2010 report: *Progress towards achieving the Kyoto objectives*. This annual report to the European Parliament and the Council is required by Article 5 of Decision 280/2004/EC of the European Parliament and of the Council concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol (the EU Monitoring Mechanism) and its implementing provisions ([3]).

([1]) Accession negotiations have not been opened yet for the former Yugoslav Republic of Macedonia.
([2]) Few data sets of updated greenhouse gas emission projections to a sufficient level of detail were provided by Member States in 2010. Consequently, only projections from Denmark and Ireland were taken into account in this assessment.
([3]) Commission Decision 2005/166/EC of 10 February 2005 laying down rules implementing Decision No 280/2004/EC of the European Parliament and of the Council concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol.

1.2 Data sources

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 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.

The biennial reporting requirement under the Monitoring Mechanism Decision only requires EU Member States to report new projections and policies and measures in odd years. Information contained in the fifth National Communications was already included in last year's trends and projections report. Accordingly, there was little new information available from Member States apart from updated emission figures compared to last year's report.

The data and analyses presented are mostly based on:

- national GHG inventory submissions under the Kyoto Protocol, covering the period 1990–2008 ([4]);
- preliminary estimates of their 2009 national emissions provided by Denmark, Germany, Italy, the Netherlands, Norway, Slovenia, Spain, Switzerland and the United Kingdom;
- EEA estimates of 2009 emissions for the EU-15 and Slovakia ([5]);
- the Community Independent Transaction Log (CITL) for verified emissions under the EU emission trading scheme, second national allocation plans (NAPs) and the subsequent European Commission decisions;
- expected CO_2 removals from carbon sequestration activities (LULUCF); and the
- intended use of the Kyoto flexible mechanisms at government level.

([4]) This includes the LULUCF tables submitted under the Kyoto Protocol and the Standard Electronic Format tables for units contained in national registries.

([5]) Although it has not prepared a preliminary estimate of its 2009 national emissions, Slovakia agreed to use the estimate prepared by the EEA for the present report.

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 limit or reduce their domestic emissions. They can also increase their emission budget for the period 2008–2012 (assigned amount) through the use of flexible mechanisms and LULUCF activities.
- The contribution of the sectors covered by the EU emission trading scheme (EU ETS) towards achieving each country's Kyoto target has been determined in the national allocation plans, 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.
- Consequently, the allocation of EU allowances under the EU ETS also determined indirectly a limit to the emissions of the sectors **not** covered by the EU ETS. Governments must therefore achieve further emission reductions in the non-trading sectors to reach their Kyoto target.
- To ensure that the EU-15 reaches its common target, all its Member States must achieve their respective burden-sharing target. Indeed, excess compliance units resulting from overachievement by some countries might not be available to the EU-15 for achieving compliance.

2.1 Emission targets under the Kyoto Protocol and the burden-sharing agreement

Under the Kyoto Protocol, the EU-15 has taken on a common commitment to reduce emissions between 2008 and 2012 by 8 % on average, compared to base-year emissions. 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' (Figure 2.1).

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

Of the other EEA member countries, Iceland, Liechtenstein, Norway and Switzerland have individual targets under the Kyoto Protocol while Turkey, which acceded to the Kyoto Protocol in February 2009 has no quantified emission reduction commitment, like Cyprus and Malta. Croatia has an individual target under the Kyoto Protocol.

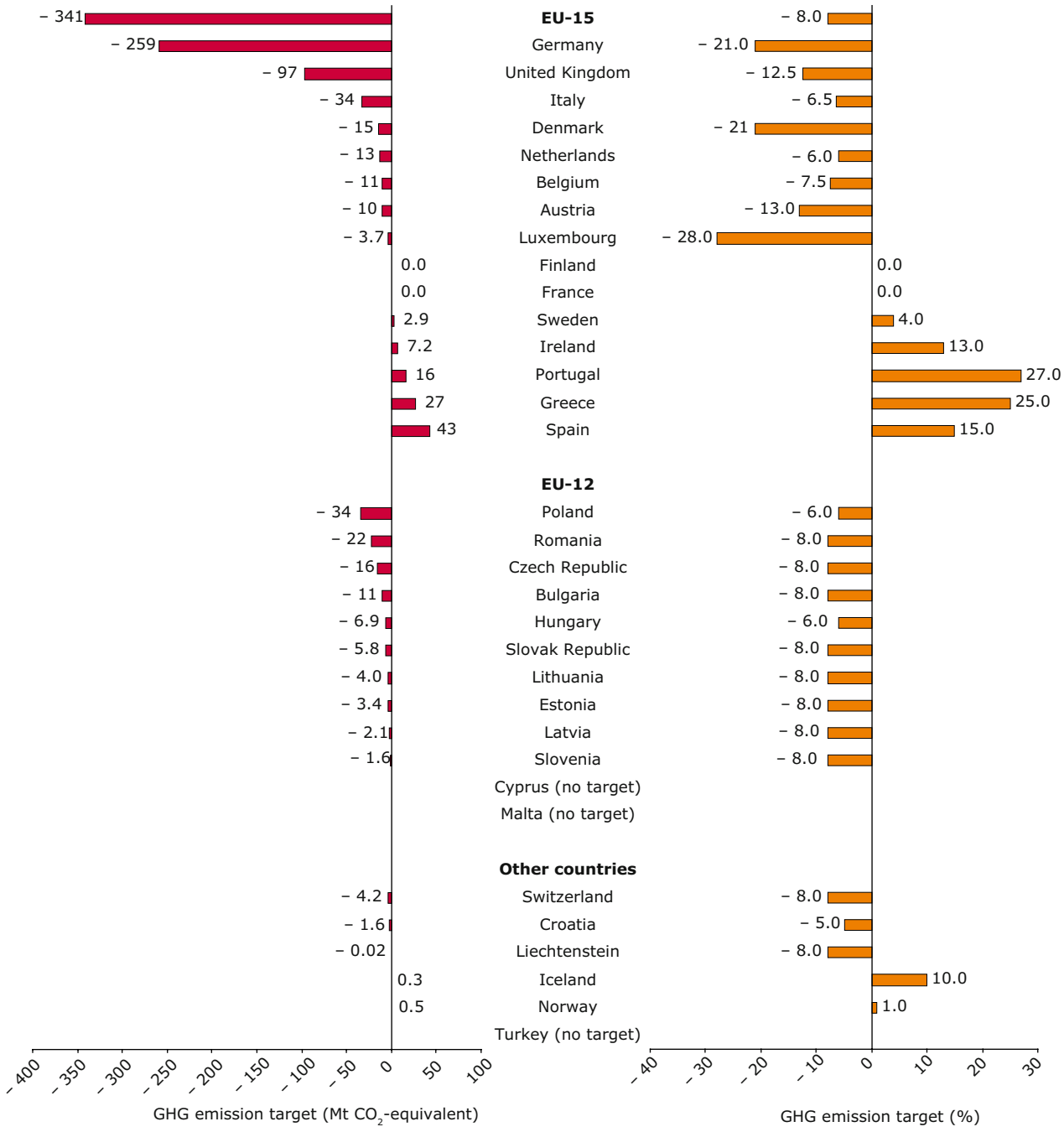
2.2 Achieving 2008–2012 objectives: the 'Kyoto compliance equation'

To comply with its objective under the Kyoto Protocol, a Party must keep its total GHG emissions during the five years of the Kyoto Protocol'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

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



Note: In Commission Decision 2006/944/EC of 14 December 2006 determining the respective emission levels allocated to the Community and each of its Member States under the Kyoto Protocol pursuant to Council Decision 2002/358/EC, the respective emission levels were expressed in t CO_2-equivalent. In connection with Council Decision 2002/358/EC of 25 April 2002 concerning the approval, on behalf of the European Community, of the Kyoto Protocol to the United Nations Framework Convention on Climate Change and the joint fulfilment of commitments thereunder, the Council of Environment Ministers and the Commission have, in a joint statement, agreed to take into account inter alia the assumptions in Denmark's statement to the Council Conclusions of 16–17 June 1998 relating to base-year emissions in 2006. In 2006, it was decided to postpone a decision on this until after all Community and Member State initial reports have been reviewed under the Kyoto Protocol.

Source: UNFCCC; EEA.

amount is measured in assigned amount units (AAUs);
- *plus/minus* any additional Kyoto units that the Party has acquired from or transferred to other Parties through the Kyoto mechanisms (CERs from clean development mechanism projects, ERUs from joint implementation projects or AAUs from international emission trading between governments);
- *plus/minus* any additional Kyoto units that the Party has issued/cancelled for net removals/ emissions from a LULUCF activity (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)'

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 Kyoto Protocol.

After final emissions have been reported and reviewed for the entire commitment period, Parties to the Kyoto Protocol 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 2008 but cannot predict whether a country will finally be in compliance or not.

2.3 Impact of the EU ETS on the achievement of Member State targets

The EU ETS is a domestic EU policy which aims at achieving cost-efficient emission reductions by setting emission targets to operators of installations in the EU. Liechtenstein and Norway have both joined the EU ETS and must comply with the same rules and regulations as the EU Member States. Operators have the choice between reducing their own emissions and purchasing carbon allowances on the European carbon market, whenever this is more cost-effective.

The EU ETS is also linked to the flexible mechanisms under the Kyoto Protocol. Any transfer of allowances under the EU ETS eventually also leads to a transfer of AAUs under the Kyoto Protocol between Member States. An ETS allowance serves the purpose of proving compliance of an operator under the EU ETS whereas an AAU can be used by a Member State itself for compliance under the Kyoto Protocol. Assessing Member States progress towards Kyoto targets, including the use of flexible mechanisms under the Kyoto Protocol, therefore requires incorporating also the effects of the allocation of allowances in the EU ETS on the overall balance between emissions in the sectors not covered by the EU ETS and Kyoto units available to the government for compliance with emissions in these sectors.

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

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

With: '**net balance of allowances under the EU ETS**' = '2008–2012 GHG emissions covered by the EU ETS' – '2008–2012 emission cap in the EU ETS'

The assessment of EU-15 progress towards its 8 % reduction target using this method is presented in Section 3.1.

Following the introduction of the EU ETS and the finalisation of the second national allocation plans, Member States, Liechtenstein and Norway have determined national caps for the emissions

from sectors covered by the EU ETS for the first commitment period of the Kyoto Protocol. These caps correspond to a certain number of Kyoto units being transformed into EU emission allowances and allocated to EU ETS operators. By setting cap levels, these countries have fixed the overall contribution of the EU ETS towards reaching their burden-sharing or Kyoto target. They have, consequently, determined the number of Kyoto units remaining for the other sectors not covered by the EU ETS. 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. Governments must therefore reach their Kyoto targets through emission reductions from policies and measures addressing the sectors not covered by the EU ETS and/or through flexible mechanisms.

Once national caps have been fixed for the sectors covered by the EU ETS, emission levels in these sectors result in the trading of allowances at EU ETS level, but do not influence the Kyoto achievement of a Member State ([6]), since EU ETS operators are legally bound to surrender to their government an amount of allowances equivalent to their emissions.

2.4 Implications of target over-delivery by some Member States

A Member State who would limit or reduce its domestic emissions below its total assigned amount would hold an amount of unused AAUs (or other unit types) by the end of the commitment period. Such over-deliveries with domestic policies and measures alone are projected by France, Germany, Greece, Sweden and the United Kingdom, with the largest surplus AAUs in the EU-15 anticipated by France, Germany and the United Kingdom. Most EU-12 Member States also project large amounts of surplus AAUs (Figure 2.2).

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

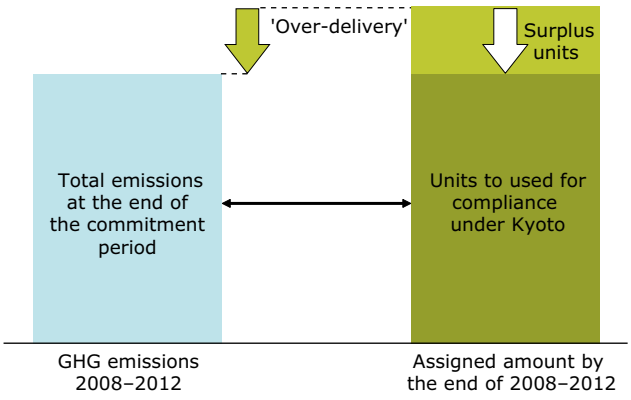
- transferred to another Party's registry (e.g. under international emission trading);
- 'retired', i.e. used towards meeting a Kyoto or burden-sharing commitment;
- cancelled, i.e. this unit would not be further transferred or used towards meeting a Kyoto or burden-sharing commitment.

In addition, the Kyoto Protocol allows Parties holding surplus units by the end of the commitment period to request that these units (except RMUs) 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, 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 ([7]) or possibly banked, the EU-15 would not be able to benefit from these units for its compliance and

Figure 2.2 Concept of target over-delivery and surplus assigned amount



Source: EEA.

([6]) 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. Denmark and Ireland reported on the quantity of unused allowances expected to remain in the new entrants reserve that they intend to use towards achieving their Kyoto targets. In this report it has been assumed that all EUAs in all Member States will be used by the trading sector and not transferred back to national governments.

([7]) For example, the Government of the United Kingdom has repeatedly stated that it reserves the right to retain or cancel surplus units in order to meet domestic policy commitments.

the extent of the over-delivery currently projected would be subsequently reduced. For example, in the United Kingdom, the Carbon Accounting Regulations ([8]) ensure that any carbon units in excess of the United Kingdom carbon budget (which is equivalent to the country's assigned amount) are cancelled and therefore not used to offset GHG emissions in the United Kingdom or elsewhere during for the first commitment period 2008–2012.

In a hypothetical situation where no EU-15 Member State would make available any surplus Kyoto unit to the EU-15 for its compliance, the EU-15 would have to rely on each single EU-15 Member State achieving its own burden-sharing target. This would put the EU-15 situation at higher risk, since any Member State not complying with its target would lead to non-compliance for the EU-15 as well.

Tracking and measuring the achievements of policies and measures in terms of emission reductions will become increasingly important, in particular in the sectors not covered by the EU ETS, since any failure in the delivery of these measures will have to be compensated 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 Kyoto Protocol, 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.

([8]) Statutory instruments, 2009. Carbon accounting regulations, No 1 257.

3 Current progress towards Kyoto targets

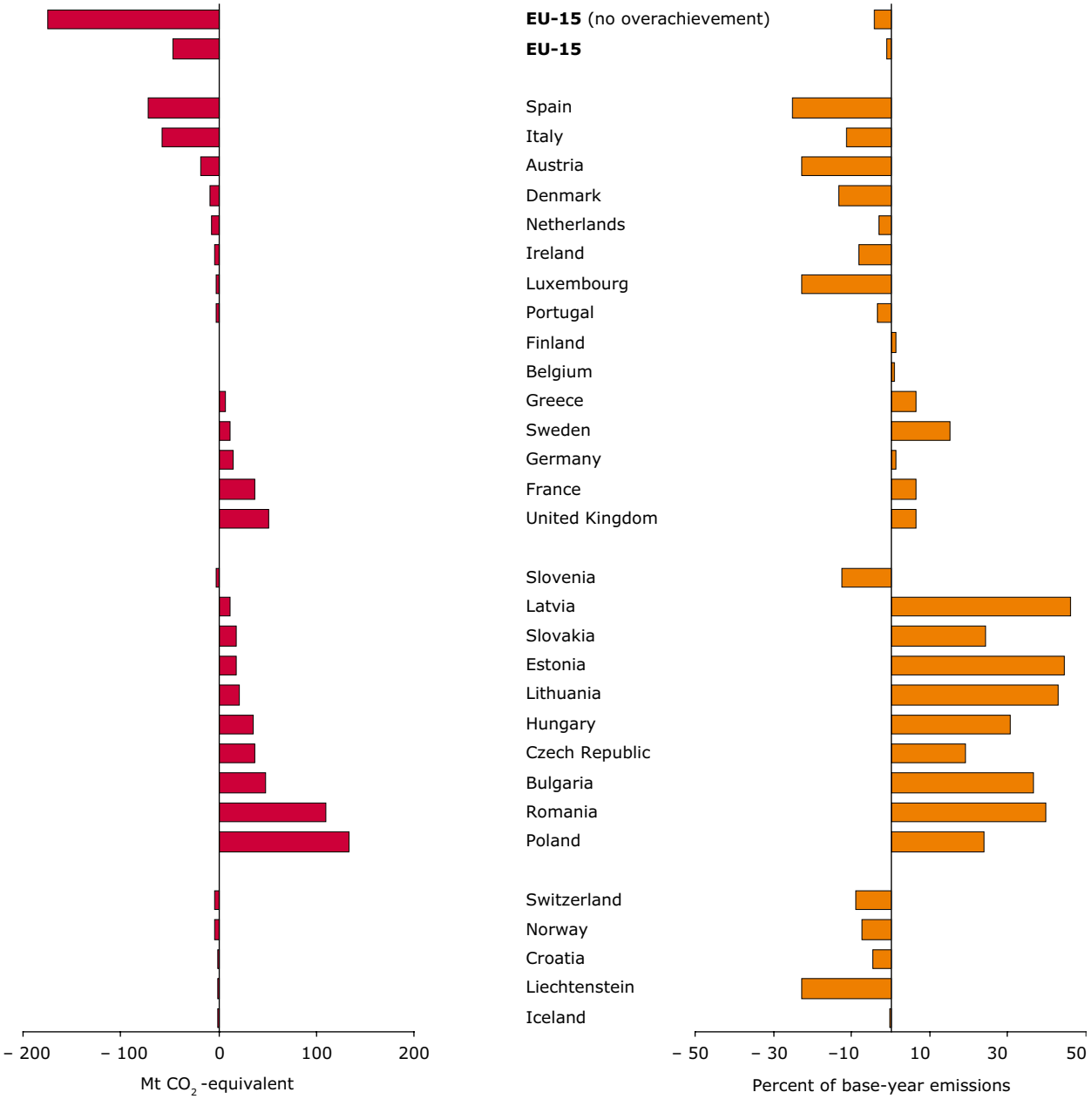
- In 2008, the first year of the commitment period, GHG emissions in eight EU-15 Member States (Belgium, Germany, Greece, Finland, France, the Netherlands, Sweden and the United Kingdom), nine EU-12 Member States (Bulgaria, Czech Republic, Estonia, Hungary, Lithuania, Latvia, Poland, Romania and Slovakia) and one other EEA member country (Norway) were lower than their respective Kyoto targets, taking into account the effect of domestic emission trading schemes. These countries were therefore on track towards achieving their Kyoto commitments in 2008.
- Taking into account the intended use of flexible mechanisms and emission reductions from LULUCF activities over the full commitment period, five additional Member States (Ireland, Luxembourg, Portugal, Slovenia and Spain) and one other EEA member country (Iceland) are also on track towards their targets in 2008.
- Three EU Member States (Austria, Denmark and Italy), two other EEA member countries (Liechtenstein and Switzerland) as well as one EU candidate country (Croatia) need to further reduce emissions by 2012 or plan to increase their quantity of Kyoto units further than they currently do in order to achieve their respective Kyoto targets.
- Estimates of 2009 GHG emissions available for a third of the 32 EEA member countries (Denmark, Germany, Italy, the Netherlands, Luxembourg, Norway, Spain, Slovakia, Slovenia, Switzerland and the United Kingdom) show that over the period 2008–2009, the actual progress of these countries towards their targets does not change significantly compared to 2008. In particular, Denmark, Italy and Switzerland remain above their respective targets in 2008–2009, despite their planned used of flexible mechanisms and carbon sink removals and the effect of the economic recession on GHG emissions. No 2009 information is currently publicly available for Austria, Croatia and Liechtenstein.
- The EU-15 is well on track towards achieving its commitment under the Kyoto Protocol of reducing its emissions by 8 % compared to base-year levels, with a current total overachievement of 253 Mt CO_2-equivalent per year (5.9 % of base year emissions) for the two years 2008 and 2009, when the intended use of flexible mechanisms and carbon sinks removals are taken into account. This assumes that the overachievement of their target by certain Member States could cover for any shortfall existing in other Member States, which cannot be taken from granted.
- The economic crisis, which resulted in significant reductions of total GHG emissions in 2009, had a somewhat lesser impact on progress towards Kyoto targets because emission reductions in the sectors not covered by the EU emission trading scheme (EU ETS) were not as large as overall reductions.
- Most countries intend to make use of the flexible mechanisms, either as buyers or as sellers of emission units. For the EU-15, the intended net acquisition amounts to 117 million units or 2.7 percent of base-year emissions.
- The expected effect of LULUCF activities in the EU-15 corresponds to a removal of 42 Mt CO_2 per year of the commitment period (1.0 percent of EU-15 base-year emissions). Five European countries (Belgium, Estonia, the Netherlands, Portugal and Slovakia), report net sources from land use activities, based on their reporting under the Kyoto Protocol showing their actual use of LULUCF activities.

3.1 Current progress based on 2008 emissions

3.1.1 Emission levels and the EU ETS

National GHG inventories are only available for the year 2008, the first year of the first commitment period under the Kyoto Protocol. In 16 of the 30 European countries assessed in this report, 2008 GHG emissions were below the respective Kyoto target (Figure 3.1). The results provided by such simple comparison should be interpreted with care, as it does not take into account the important role played by emission trading schemes such as the EU ETS ([9]) — and more specifically the level of allocated allowances — in the variation of

Figure 3.1 Gap between 2008 GHG emissions and Kyoto targets, not accounting for the effect of allocation of allowances to the EU ETS



Note: A positive value indicates that national emissions were lower than the cap, i.e. that the respective country would achieve its Kyoto target through domestic action alone.

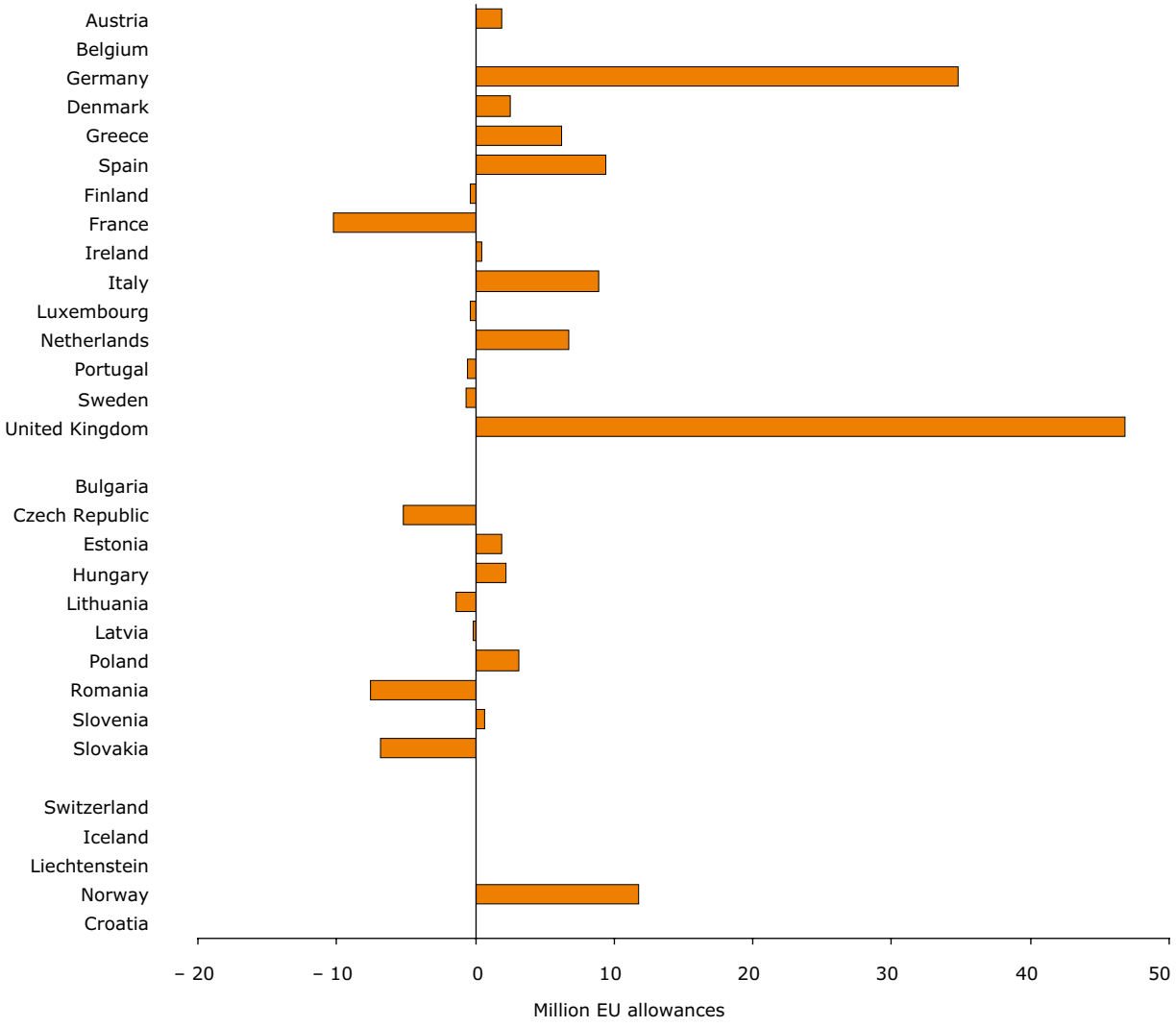
Source: EEA, 2010; UNFCCC.

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

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. This assessment gives therefore only a first rough but incomplete impression of the progress achieved towards targets.

A more accurate assessment of progress based on a comparison of total emissions with Kyoto targets requires accounting for the effect of allocation of allowances to the EU ETS on assigned amounts in 2008. This effect concerns all 27 Member States, Liechtenstein and Norway (who all participate to the EU ETS) as well as Switzerland, which has it own emission trading scheme. In the EU-25 ([10]), emissions from installations covered by the scheme were higher than the quantity of allowances issued to operators by 92 Mt CO_2-equivalent (Figure 3.2). Consequently, on the basis of 2008 data only, the assigned amount available to Member States should have increased, ETS operators having to surrender more than they had been allocated.

Figure 3.2 Effect of the difference between allocation to the EU ETS and verified emissions in 2008 on progress towards Kyoto targets



Note: A positive value indicates that EU ETS verified emissions were higher than quantity of issued allowances in 2008. Although they participate to the EU ETS, Cyprus and Malta are not considered here since they do not have a Kyoto target.

Source: CITL, 2010; NAP table decisions; EEA.

([10]) Although they participate to the EU ETS, Cyprus and Malta are not considered here since they do not have a Kyoto target.

Figure 3.2 is based on the difference between verified emissions from installations covered by the EU ETS and issued allowances per Member State. The quantity of issued allowances can vary over the years of the commitment period and is therefore not necessarily equal to the average annual quantity of allowances available to operators, based on national allocation plans (NAP) covering the trading period 2008–2012. For example, Norway and the United Kingdom auctioned in 2009 allowances to be used for 2008 compliance ([11]); these allowances are not included in the 2008 assessment because issuance was after the cut-off date at the end of the year. Similarly, Germany and the Netherlands issued fewer allowances in 2008 than the average cap for the full trading period 2008–2012, thereby increasing the positive effect of allocation to the EU ETS. In contrast, Italy issued more allowances in 2008 than it will issue on average over the trading period; in this case the effect of allocation to the EU ETS is underestimated.

A comparison between 2008 emission levels and assigned amounts, taking into account the effect of any allocation of allowances to the EU ETS in 2008, shows that eight EU-15 Member States and nine of the 10 EU-12 Member States with a Kyoto target (all but Slovenia) had reached a level of emissions below their respective Kyoto targets for the sectors not covered by the EU emission trading scheme in 2008 (Table 3.1, Figure 3.3). In the case of 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.

Table 3.1 Current progress towards Kyoto or burden-sharing targets

Country grouping	2008 emissions in sectors not covered by the EU ETS < Kyoto target accounting for the effect of allocation to the EU ETS	2008 emissions in sectors not covered by the EU ETS > Kyoto target accounting for the effect of allocation to the EU ETS
EU-15 Member States	• EU-15 • Belgium • Finland • France • Germany • Greece • Netherlands • Sweden • United Kingdom	• EU-15 (no overachievement) • Austria • Denmark • Ireland • Italy • Luxembourg • 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	• Croatia • Iceland • Liechtenstein • Switzerland

Note: 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.
The status of the 'EU-15' is assessed by considering the sum of the gaps of the 15 EU Member States which are part of the burden-sharing agreement. Since Member States with a surplus can use any remaining allowances for their own purposes and not necessarily transfer them via the flexible mechanisms to compensate for Member States with a shortfall, a gap is also calculated for 'EU-15 (no overachievement)', where only shortfalls are considered, but not any surplus.

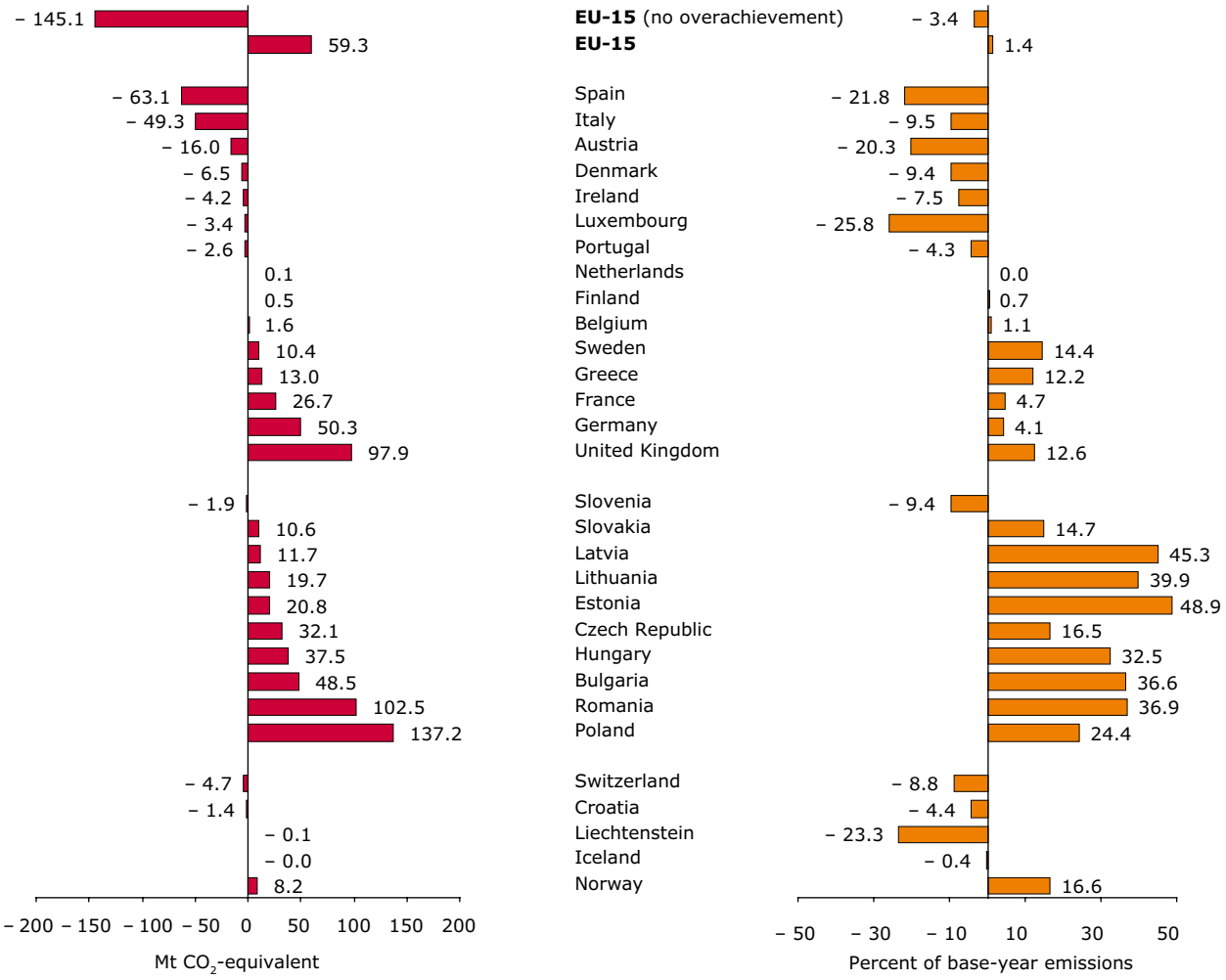
Source: EEA.

([11]) No allowance was auctioned by Norway in 2008 because the Norwegian NAP was not finalised until March 2009. The allowances set aside for auctioning in 2008 and auctioned in 2009 amounted to 6.7 million allowances.

The progress achieved in 2008 by seven EU-15 Member States (Austria, Denmark, Ireland, Italy, Luxembourg, Portugal and Spain) as well as Croatia, Iceland, Liechtenstein, Slovenia and Switzerland requires them to achieve further emission reductions from domestic policies and measures between 2009 and 2012 and/or make use of Kyoto mechanisms by the government and/or removals from carbon sink activities, in order to meet their respective target in the sectors not covered by the EU ETS.

Emissions of the EU-15 in 2008, in the sectors not covered by the ETS, were lower than the remaining target for these sectors, by a difference representing 1.4 % of the EU-15 base-year emissions. The value drops to a shortfall of 3.4 % if the current overachievement of the eight EU-15 Member States with emissions in the sectors not covered by the EU ETS below their relative targets is not taken into account (see Section 2.4). It is up to these Member States to decide what they intend to do with any remaining allowances by the end of the

Figure 3.3 Gap between 2008 GHG emissions in the sectors not covered by the EU ETS and relative Kyoto targets accounting for the effect of allocation to the EU ETS



Note: Allocation: allowances freely allocated or auctioned to the EU ETS in 2008.
A positive value indicates a country for which 2008 emissions in the sectors that are not covered by the EU ETS are below its 2008–2012 average annual target, taking into account the effect of the allocation to the EU ETS but without use of carbon sinks and Kyoto mechanisms.
The gap for 'EU-15' is assessed by considering the sum of the gaps of the 15 EU Member States which are part of the burden-sharing agreement. Since Member States with a surplus can use any remaining allowances for their own purposes and not necessarily transfer them via the flexible mechanisms to compensate for Member States with a shortfall, a gap is also calculated for 'EU-15 (no overachievement)', where only shortfalls are considered, but not any surplus.

Source: EEA.

commitment period. It should therefore not be expected that the units will be transferred via the flexible mechanisms to compensate for the gaps remaining in other countries. Spain, Italy and Austria are currently responsible for almost 90 % of the existing gap of 145 Mt CO_2-equivalent between emissions and targets in the EU-15.

3.1.2 Use of flexible mechanisms and LULUCF

Member States' assigned amounts (and subsequently the target for the sectors that are not covered by the EU ETS) can be modified by:

- the use of the Kyoto mechanisms at government level (joint implementation, clean development mechanism, international emission trading): information on the projected use of such mechanisms is reported by EU Member States in a specific questionnaire under the EU Monitoring Mechanism Decision;
- the expected CO_2 removals from carbon sink activities, under Articles 3.3 and 3.4 of the Kyoto Protocol. 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 Kyoto Protocol.

Kyoto mechanisms
As an additional means of meeting commitments under the Kyoto Protocol, 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 (joint implementation (JI), clean development mechanism in developing countries (CDM)) and international emission trading, which allows countries that have achieved emission reductions beyond those required by the Kyoto Protocol 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 the Kyoto Protocol targets.

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, Netherlands and Austria are the countries (in decreasing order) that intend to acquire the largest quantity of units. Together, EU-15 Member States intend to buy 116.7 million units per year of the commitment period through the use of flexible mechanisms, which represents 2.7 % of EU-15 base-year emissions. During the first two years of the commitment period, these countries have acquired an average 28.8 million units per year, which represents about one quarter of the intended annual use. 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.

A comparison by country between the intended use of Kyoto mechanisms and the actual use of these mechanisms based on the quantities of allowances delivered to the party holding account in the Kyoto registry in 2008 and 2009 ([12]) shows substantial differences for some countries, in particular for Austria, Italy or Spain (Figure 3.4). The observed differences can partly be explained by several reasons, i.e.:

- there are often delays in the actual delivery of Kyoto units, not least with regard to ERUs. In 2008, there were delays in connecting to the ITL, which also affected the actual delivery of credits. In addition, the establishment of national approval and registry systems has experienced a number of delays in several EU countries, as well as Russia;
- the implementation of JI/CDM projects requires a certain amount of time 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;
- purchased and delivered units may not always be held on national holding accounts. For example in Austria, the institution authorised to purchase units for the government keeps the delivered units on its account until the final retirement;
- some countries may prefer waiting for the end of the commitment period to use the flexible mechanisms, depending on their current

([12]) 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.

progress towards their targets. It should also be noted that Member States may purchase secondary credits all the way up to the true-up period.

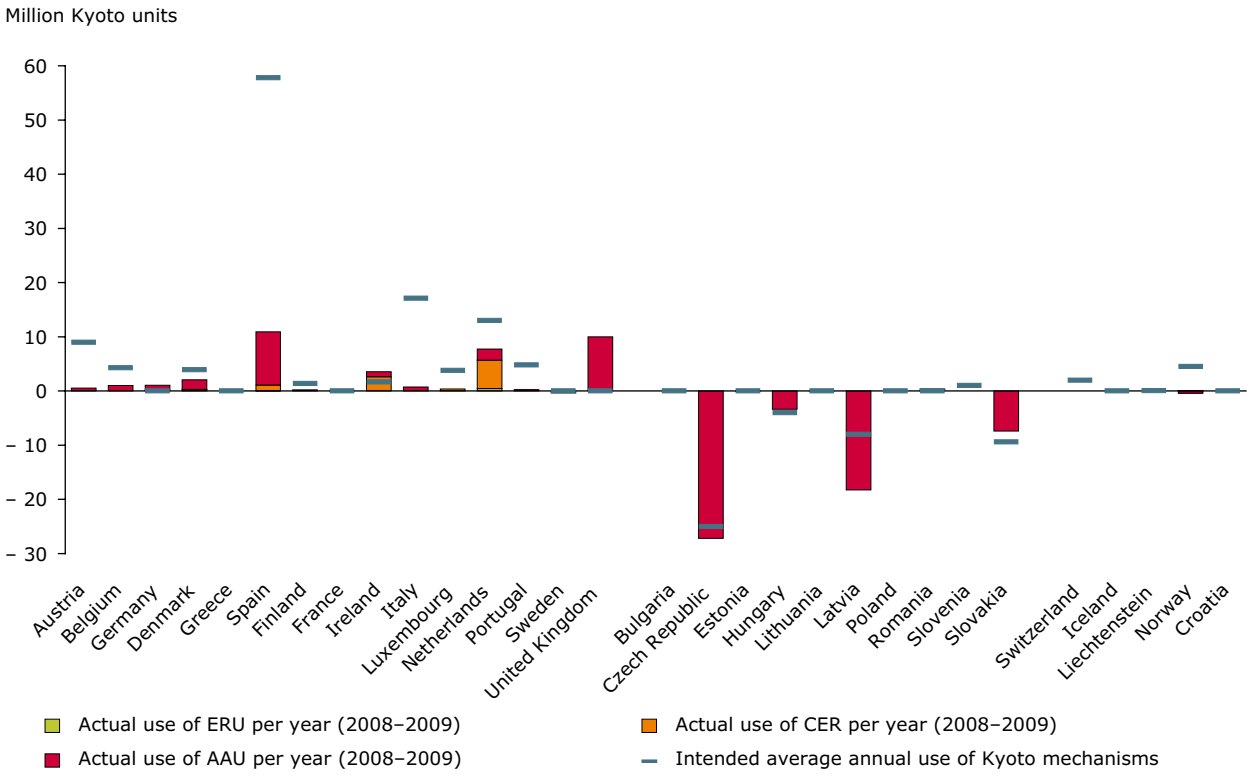
For this reason, the assessment in Section 3.1.3 is based on the intended and not actual use of flexible mechanisms.

Carbon sinks

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

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

Figure 3.4 Intended (2008–2012) and actual (2008–2009) average annual use of the Kyoto mechanisms



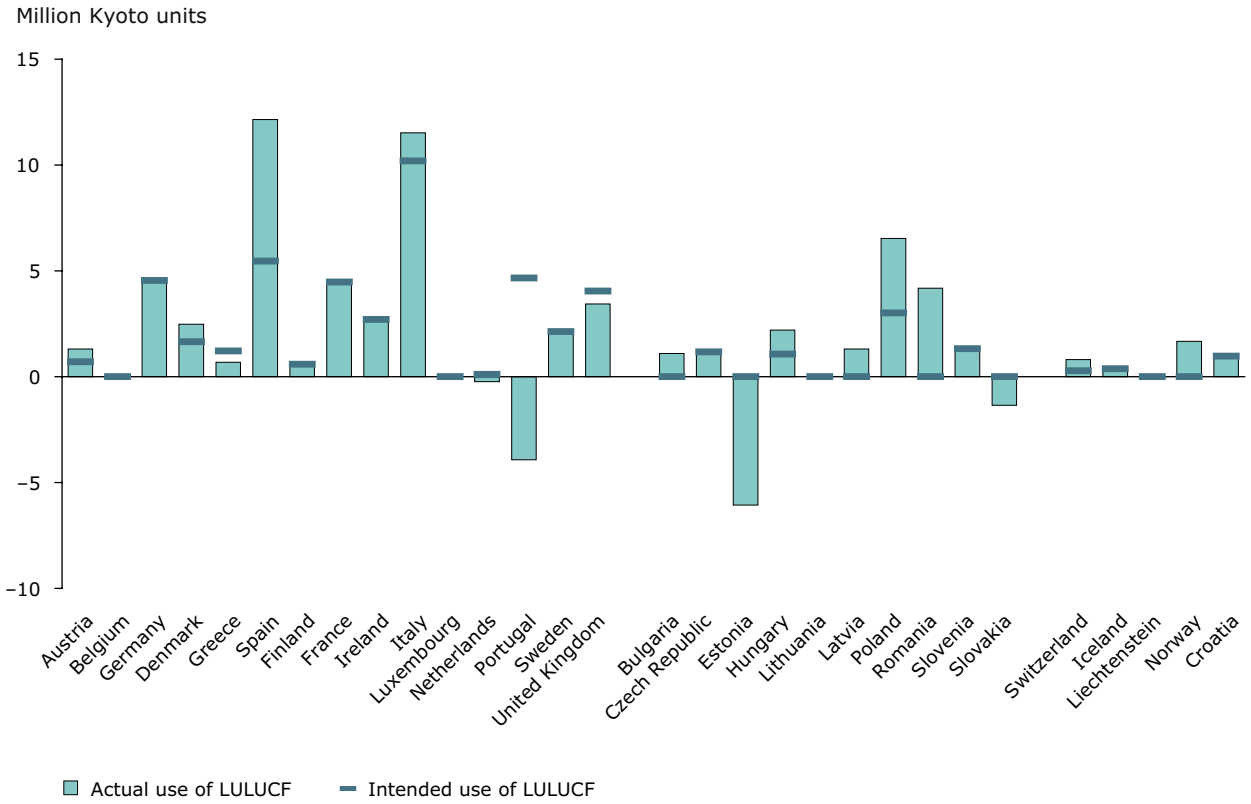
Note: A positive value indicates that the country has/intends to acquire the different types of Kyoto units. A negative value indicates that a country has/intends to sell allowances.
Actual use of Kyoto mechanisms is based on delivery of units according to the SEF table. Countries might have acquired more units than are recorded in the SEF tables, e.g. due to delivery dates later in the commitment period. Due to the late start of national and ETS registries in some countries, it was not possible to assess the actual delivery/sale of units in 2008. Therefore the average delivery/sale of units for the years 2008 and 2009 was used. For the United Kingdom, SEF tables include the over-seas territories and the crown dependencies of the United Kingdom. For the purposes of the implementation of Article 4 of the Kyoto Protocol and as not they are not part of the EC, the over-seas 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 AAU 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.

Source: SEF tables, Questionnaires on the use of flexible mechanisms, EEA.

Parties account for net emissions or removals for each activity during the commitment period by issuing RMUs (removal units) in the case of GHG removals from carbon sinks (e.g. afforestation) or cancelling Kyoto units in the case of net GHG emissions from carbon sinks. 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 Article 3.4 of the Kyoto Protocol is capped. Thus, issued RMUs corresponding to these activities might be lower than the carbon removals actually reported.

The expected annual removals/emissions from LULUCF as reported in questionnaires by EU Member States as well as Iceland and Switzerland and the actual values as reported in the LULUCF inventories under the Kyoto Protocol for 2008 are presented in Figure 3.5 ([13]). Germany, Spain and Italy reported the highest removals from LULUCF activities. Only Belgium, Estonia, Netherlands, Portugal and Slovakia reported net sources from this sector. The situation observed in Portugal in 2008 contrasts with the expectation by this country that LULUCF activities will represent a net sink over the full commitment period. However, forest 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 in Section 3.1.3 is based on the expected and not actual use of LULUCF activities.

Figure 3.5 Actual (2008) 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 considerably in future years if better data becomes available.

Source: LULUCF tables under the Kyoto Protocol; Questionnaires on the use of flexible mechanisms; JRC; EEA.

([13]) Estimated 'actual' annual accounting in during first commitment period is based on latest KP LULUCF submissions (updated 15 September 2010). All LULUCF accounting rules have been applied in the calculation of the actual use of LULUCF (cf. 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 is taking into account the same rules.

3.1.3 Current progress of European countries

The comparison of 2008 emissions with assigned amounts, taking into account all the elements of the compliance equation (effect of the allocation to the EU ETS, projected use of Kyoto mechanisms by governments and expected carbon sink reductions) shows that 22 Member States and two other EEA member countries are currently on track towards achieving their Kyoto targets (Table 3.2 and Figure 3.6). For three EU-15 Member States (Austria, Denmark and Italy), two EEA member countries (Liechtenstein and Switzerland) and Croatia, emissions remain however higher than their respective assigned amounts.

To achieve their Kyoto target, these countries must:

- achieve further emission reductions in the four remaining years of the commitment period (2009–2012);
- increase the quantity of emission credits they intend to acquire through flexible mechanisms or to generate from LULUCF activities.

In a number of countries, flexible mechanisms and LULUCF are expected to play a significant role to bridge the current gap existing between emissions and targets (Figure 3.7). In Iceland and Portugal, carbon sequestration from sinks as currently projected for the full commitment period could fully

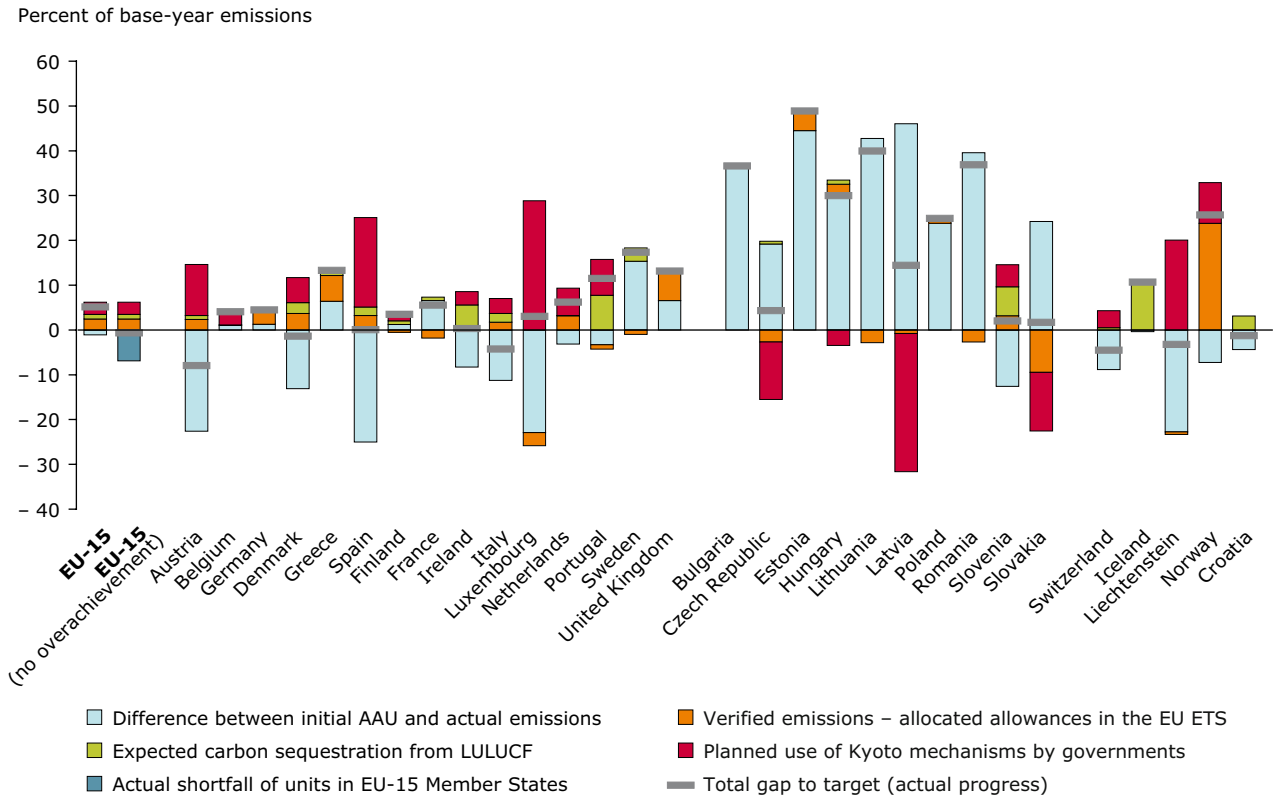
Table 3.2 Current progress towards Kyoto or burden-sharing targets, taking into account the effect of allocation to the EU ETS, planned use of flexible mechanisms by governments and carbon sinks

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

Note: Target = [Kyoto or burden-sharing target — allocation 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.
The status of the 'EU-15' is assessed by considering the sum of the gaps of the 15 EU Member States which are part of the burden-sharing agreement. Since Member States with a surplus can use any remaining allowances for their own purposes and not necessarily transfer them via the flexible mechanisms to compensate for Member States with a shortfall, a gap is also calculated for 'EU-15 (no overachievement)', where only shortfalls are considered, but not any surplus.

Source: EEA.

Figure 3.6 Decomposition of current progress towards Kyoto targets in 2008



Note: The assessment is based on emissions for year 2008 and the effect of allocation to the EU ETS in 2008, the planned use of flexible mechanisms as well as the expected effect of LULUCF activities.
A positive sign signifies a favourable contribution towards target achievement.
The gap for 'EU-15' is assessed by considering the sum of the gaps of the 15 EU Member States which are part of the burden-sharing agreement. Since Member States with a surplus can use any remaining allowances for their own purposes and not necessarily transfer them via the flexible mechanisms to compensate for Member States with a shortfall, a gap is also calculated for 'EU-15 (no overachievement)', where only shortfalls are considered, but not any surplus.

Source: EEA.

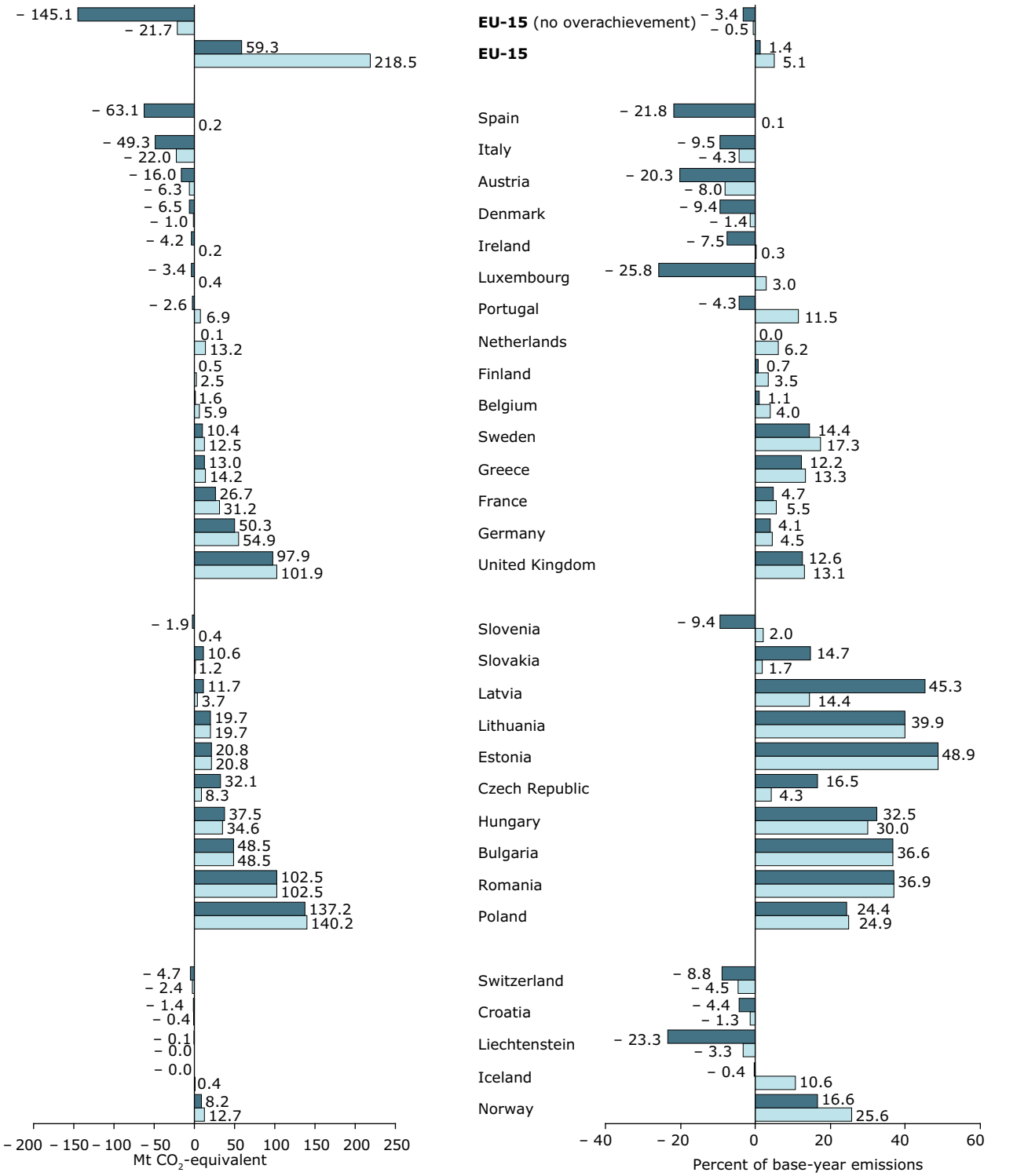
cover the gap existing between current emission levels in the sectors not covered by the EU ETS and their targets. It also represents more than half of the gap between emissions in the sectors not covered by the EU ETS and their targets in Ireland and Slovenia. The use of flexible mechanisms currently planned by governments could fully bridge the gap between current emissions in the sectors not covered by the EU ETS and targets in Luxembourg and Portugal and represents more than half of that current gap in Austria, Denmark, Liechtenstein, Slovenia and Spain. 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.

3.1.4 Current progress of the EU-15

Aggregated emissions from EU-15 Member States in 2008 were already lower than the EU-15 Kyoto target when the effect of allocation to the EU ETS is taken into account. This positive gap is further increased when the aggregated effects of Kyoto mechanisms' planned use and carbon sinks' expected removals are taken into account. From this perspective, the EU-15 appears well on track towards reaching its Kyoto target in 2008.

If any overachievement by EU-15 Member States currently on track towards their targets in 2008 is not accounted for, due to the possibility left to these countries to dispose of any surplus units at will, the difference between emissions and target for the EU-15 changes from + 218 Mt CO_2-equivalent (on track) to 29 Mt CO_2-equivalent (not on track, by a gap of 0.7 % of total 2008 emissions or 0.7 % of base-year emissions). This gap is the result of the shortfalls observed in 2008 for Austria (6 Mt CO_2-equivalent or 8 % of base-year emissions), Italy (– 22 Mt CO_2-equivalent or 4.3 % of base-year emissions) and Denmark (– 0.4 Mt CO_2-equivalent or 1.4 % of base-year emissions).

Figure 3.7 Gap between average annual emissions in 2008 and Kyoto targets with and without the use of flexible mechanisms and carbon sinks



Gap to target (domestic emissions including effect of the allocation to the EU ETS) in 2008

Gap to target (including plans on Kyoto mechanisms. Carbon sinks and effect of the allocation to the EU ETS) in 2008

Note: A positive value indicates a country for which emissions in 2008 were lower than the annual target. The assessment is based on emissions for year 2008 and the effect of allocation to the EU ETS in 2008, the planned use of flexible mechanisms as well as the expected effect of LULUCF activities. The gap for 'EU-15' is assessed by considering the sum of the gaps of the 15 EU Member States which are part of the burden-sharing agreement. Since Member States with a surplus can use any remaining allowances for their own purposes and not necessarily transfer them via the flexible mechanisms to compensate for Member States with a shortfall, a gap is also calculated for 'EU-15 (no overachievement)', where only shortfalls are considered, but not any surplus.

Source: EEA.

3.2 Current progress based on 2008 and 2009 emissions

Although official national GHG emission inventories including the year 2009 will not be available before 2011 ([14]), a number of estimates of 2009 GHG emission data are already publicly available for a limited number of European countries. In 2010, besides their official inventory submission to the UNFCCC covering the period 1990–2008, Denmark, Germany, Italy, the Netherlands, Norway, Slovenia, Spain, Switzerland and the United Kingdom submitted national estimates of their 2009 emissions and made them available for the assessment of the progress towards Kyoto targets. The EEA also calculated 2009 emissions for all EU Member States, the EU-15 and the EU-27. In addition, Slovakia agreed on the use of the EEA estimates. Such data can help policymakers to better track progress in Europe and to assess more accurately the need for further action at EU and national levels to achieve the respective Kyoto targets.

These 2009 emission estimates show that in most countries, the overall progress towards achieving the Kyoto targets, now based on the two years of the commitment period 2008 and 2009, does not change significantly compared with the assessment based on 2008 emissions only, despite the effect of the economic recession on GHG emissions (Figure 3.8). The EU-15 somewhat improved its situation vis-à-vis its Kyoto target, increasing its current overachievement by about 0.8 % of base-year emissions.

Figure 3.8 Decomposition of the progress towards Kyoto targets in 2008 and 2008–2009 for countries where 2009 proxy data are available

Note: The assessment is based on emissions and the effect of allocation to the EU ETS, for the year 2008 and for the period 2008–2009, the planned use of flexible mechanisms as well as the expected effect of LULUCF activities.
A positive sign signifies a favourable contribution towards target achievement.
Countries not represented on this figure either did not submit a proxy inventory for 2009 and did not agree to use the EEA estimate, or submitted a proxy inventory but did not agree on its publication.

Source: EEA.

([14]) National greenhouse gas emission inventories are normally available approximately 15 months after the end of each calendar year.

On average over the two years 2008 and 2009, aggregated emissions in the EU-15 in the sectors not covered by the EU ETS are estimated to be more than 250 million tonnes CO_2-equivalent below their non-ETS target. This puts EU-15 collectively 5.9 % below the 8 % Kyoto reduction target, taking into account the planned use of the Kyoto Protocol's flexible mechanisms by governments (2.7 % of base-year emissions) and the expected sequestration of atmospheric carbon due to forestry activities (1.0 % of base-year emissions). However, as stated before, failure by any EU-15 Member State to achieve its own burden-sharing target could jeopardize the possibility for the EU-15 to achieve its common target.

Denmark, Italy and Switzerland remain above their respective targets, regardless of their planned use of flexible mechanisms and carbon sink removals. In the case of Denmark, however, the gap to target remaining by the end of 2009 becomes relatively small and may fall within the uncertainty range of 2009 estimates. Furthermore, according to projections from that country and reported by the European Commission, Denmark expects to bridge its remaining gap through further emission reductions over the period 2010–2012. Similarly, Switzerland estimates that further emission reductions over the period 2010–2012 will close the remaining gap. No 2009 information is currently publicly available for Austria, Croatia and Liechtenstein, the three other countries which were not on track towards their targets on the basis of their emissions in 2008.

The availability of recent emissions estimates in additional countries would provide a more complete and accurate picture of the overall situation in Europe with regards to current progress towards Kyoto targets.

Although the recent economic crisis did result in important emission reductions in EU-27 in 2009 (– 6.9 % compared to 2008 for total emissions), these reductions were less important in the sectors not covered by the EU ETS (– 3.3 %) than in the trading sectors (– 11.7 %). The crisis helped Member States achieving their Kyoto targets to the extent that it triggered further emission reductions in the sectors not covered by the EU ETS (e.g. transport, buildings, agriculture and waste) (Section 2.3). Further emission reductions under the EU ETS have reduced the need for operators to use emission allowances for compliance under the EU ETS. These freed-up allowances can be sold on the carbon market or banked for future use, notably in the third trading period 2013–2020.

4 EU projected progress towards Kyoto and 2020 targets

- Under the Kyoto Protocol, the EU-15 has committed to a common emission reduction target of – 8 % compared to base-year levels, to be achieved over a five-year commitment period from 2008 to 2012.
- Based on recent EEA estimates, 2009 emissions in the EU-15 were 6.9 % lower than in 2008. Despite possible short-term rises in European emissions subsequent to the recovery from the economic crisis, projections published by the European Commission 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.
- As for the assessment of current progress, this result relies on the assumption — which cannot be taken for granted — that the overachievement of their target by certain Member States could cover for any shortfall existing in other Member States.
- The EU-27 has committed 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 other major emitting countries agree to similar targets
- Based on the latest emission data, the EU-27's 2009 emissions stand approximately 17.3 % below the 1990 level and therefore very close to the bloc's target of cutting emissions 20 % by 2020.
- Current emission levels and projections show that the EU-27 is well on track towards achieving its 2020 reduction target of 20 % with domestic emission reductions only, provided that Member States fully implement the Climate and Energy package adopted in 2009.

4.1 EU-15 projected progress towards its Kyoto target

Under the Kyoto Protocol, the EU-15 has committed to a common emission reduction target of – 8 % compared to base-year levels, to be achieved over a five-year commitment period from 2008 to 2012.

Based on recent EEA estimates, 2009 emissions in the EU-15 were 6.9 % lower than in 2008. Therefore in 2009, EU-15 emissions stood therefore 12.9 % below the base-year level, exceeding for the first time its Kyoto commitment to an 8 % reduction.

In 2010, fully updated and complete projections were available from Denmark and Ireland. These projections take into account the likely effects of the economic recession and provide specific details on emissions projected in the sectors not covered by the EU ETS during the Kyoto commitment period, a necessary information to be able to assess projected progress towards Kyoto targets (see Section 2.3). Updated results from the PRIMES and GAINS models were also published in September 2010, based on updated economic assumptions and providing the same minimum level of detail to allow assessing the achievement of non-ETS targets.

An updated assessment of projected progress of the EU-15 towards achieving its common reduction target under the Kyoto Protocol was made on the basis of these national projections from Denmark and Ireland and the updated PRIMES/GAINS baseline projections ([15]) of emissions for the 13 other EU-15 Member States.

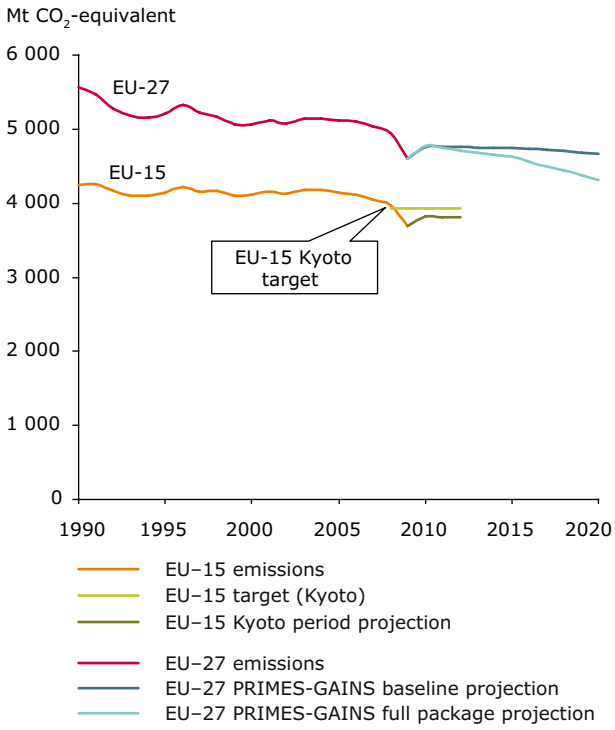
According to these projections, despite possible short-term increases in European emissions subsequent to the recovery from the economic crisis, assuming that with the current policies and measures in

([15]) European Commission, 2010.

place, average EU-15 GHG emissions over the full commitment period 2008–2012 could reach a level 10.4 % below base-year levels (Figure 4.1). In the EU-15, the sectors outside the EU ETS would contribute to over-achieve the Kyoto target by 1.2 % of base-year emissions through domestic emission reductions only. Use of the Kyoto mechanisms by governments is expected to deliver an additional 2.7 % emission reduction, and total removals from carbon sink activities (LULUCF) represent a further 1.0 % reduction.

Taking these elements into account, the EU-15 could achieve a total reduction well beyond its target. As for the assessment of current progress, this result relies on the assumption — which cannot be taken for granted ([16]) (see Section 2.4) — that the overachievement of their target by certain Member States could cover for any shortfall existing in other Member States.

Figure 4.1 Projections of EU-15 and EU-27 emissions during the Kyoto commitment period



Note: Emissions from international aviation, although included in the 2020 target, are not taken into account in this figure's past trends, projections and targets. The figure includes emissions from domestic maritime transport.

Source: EEA, 2010; European Commission, 2010.

4.2 EU-27 projected progress towards its 2020 target

Looking forward from the Kyoto Protocol, in March 2007, the European Council committed the EU-27 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.

Based on the latest emission data, the EU-27's 2009 emissions stand approximately 17.3 % below the 1990 level and therefore very close to the bloc's target of cutting emissions 20 % by 2020.

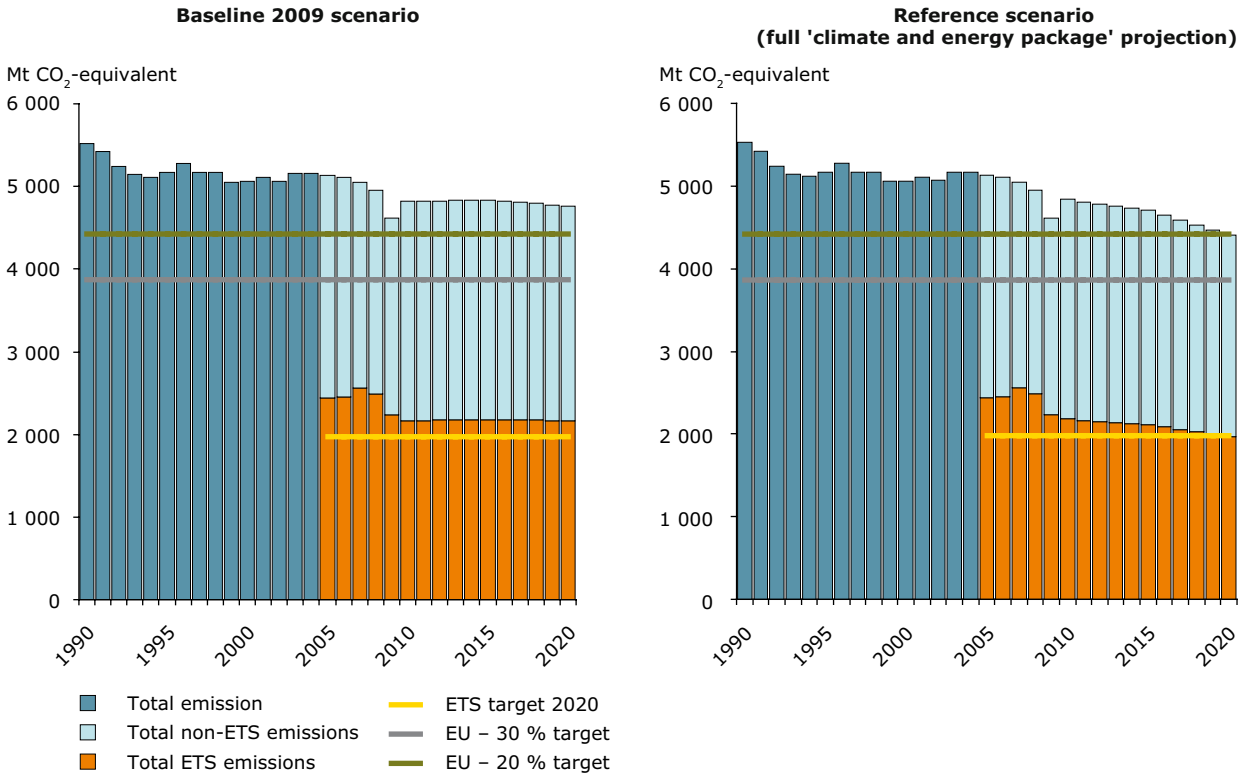
According to the PRIMES/GAINS baseline emission scenario, with the existing policy measures, EU GHG emissions in 2020 (including international aviation) are projected to be 14 % lower than 1990 (Figure 4.2, left panel). This means that in 2020, a 6 % gap is expected to remain if additional measures or the financing of emission reduction initiatives outside the EU do not occur. The emission reduction in the baseline scenario is build up by a 6 % emission reduction in CO_2 emissions in the period 2005–2020 (mainly in the ETS sectors) and a 13 % emission reduction of non-CO_2 emissions in the same period (mainly in the non-ETS sector).

The concrete implementation of the 20 % target was put into legislation with the Climate and Energy package as adopted in April 2009. Under this package, the target, which is equivalent to a 14 % reduction in GHG emissions between 2005 and 2020, is split into two sub-targets: a 21 % reduction target compared to 2005 for the emissions covered by the EU ETS (excluding aviation) and a 10 % reduction target compared to 2005 for the remaining non-ETS sectors. Starting from the baseline scenario, the PRIMES/GAINS model setup evaluated the impact of the Climate and Energy package through the so-called reference scenario. This scenario assumes a full national implementation of the Climate and Energy package, including non-ETS and renewable energy targets. The resulting emission trend projection shows that the EU-27 emissions in 2020

([16]) For example, in the United Kingdom, the Carbon Accounting Regulations ensure that any carbon units in excess of the United Kingdom carbon budget (which is equivalent to the country's assigned amount) are cancelled and therefore not used to offset greenhouse gas emissions in the United Kingdom or elsewhere during for the first commitment period 2008–2012.

could be 20 % lower than the 1990 values — or 14 % lower than in 2005 (Figure 4.2, right panel). The reference scenario shows a 12.5 % emission reduction between 2005–2020 for CO_2 emissions. Non-CO_2 emissions are reduced by 21 % in the 2005–2020 period. The PRIMES/GAINS result indicate that over the period 2013–2020 there is expected to be no shortage of emissions allowances, so that the emission reduction can be achieved domestically (no international credits needed).

Figure 4.2 Total GHG emissions PRIMES/GAINS baseline in EU-27 in Mt CO_2-equivalent



Source: EEA, 2010; modified from European Commission, 2010.

5 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-eq.) 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 Kyoto Protocol. 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 Kyoto Protocol 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-eq. 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 Kyoto Protocol'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 Kyoto Protocol 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 Kyoto Protocol mechanism that allows Annex I Parties to purchase emission allowances from projects in 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 Kyoto Protocol 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	Table where Kyoto Protocol units are reported in an agreed standard electronic format (SEF).
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

References

European Commission, 2006. *Commission Decision 2006/944/EC of 14 December 2006 determining the respective emission levels allocated to the Community and each of its Member States under the Kyoto Protocol pursuant to Council Decision 2002/358/EC*, OJ L 358, 14.12.2006, p.87. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:358:0087:0089:EN:PDF.

European Commission, 2010. *EU energy trends to 2030 — Update 2009*, European Commission Directorate-General for Energy in collaboration with Climate Action DG and Mobility and Transport DG. http://ec.europa.eu/energy/observatory/trends_2030/index_en.htm.

EEA, 2006. *The European Community's initial report under the Kyoto Protocol, Report to facilitate the calculation of the assigned amount of the European Community pursuant to Article 3, paragraphs 7 and 8 of the Kyoto Protocol, Submission to the UNFCCC secretariat*, EEA Technical report No 10/2006, European Environment Agency. http://unfccc.int/national_reports/initial_reports_under_the_kyoto_protocol/items/3765.php.

EEA, 2009. *Greenhouse gas emission trends and projections in Europe 2008, Tracking progress towards Kyoto targets*, EEA Report No 9/2009, European Environment Agency. www.eea.europa.eu/publications/eea_report_2009_9.

EEA, 2010. *Annual European Community greenhouse gas inventory 1990–2008 and inventory report 2010, Submission to the UNFCCC Secretariat*, EEA Technical report No 6/2010, European Environment Agency. www.eea.europa.eu/publications/european-union-greenhouse-gas-inventory-2010.

ETC/ACC, 2010. Approximated EU GHG inventory for the year 2009, ETC/ACC Technical paper 2010/4. http://air-climate.eionet.europa.eu/reports/ETCACC_TP_2010_4_EU_GHG_Inv2009.

Country profiles

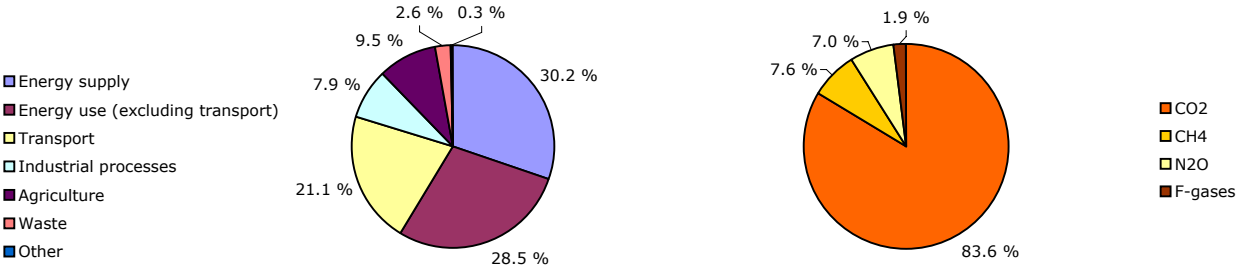
Country profiles have been prepared for all EEA member countries and EU candidate country Croatia. The country profiles present key data on trends in greenhouse gas emissions over the period 1990–2008 (or 1990–2009 where data were available), with additional data on the EU ETS for 2007–2009. All data made available by member countries up to mid September 2010 is included. The country profiles also include brief assessments of past trends (1990–2008, 2007–2008) and progress achieved so far towards Kyoto Protocol targets (where applicable).

GHG trends and projections in the EU-15

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	4 244.7	4 046.2	3 970.5	3 696.5	Mt CO_2-eq.	n.a.	n.a.
GHG from international bunkers [4]	165.2	300.9	296.0	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG per capita	11.6	10.3	10.1	9.3	t CO_2-eq. / capita	n.a.	n.a.
GHG per GDP [5]	606	402	392	381	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	76.2 %	80.3 %	80.4 %	80.4 %	%		
EU ETS verified emissions [6]		1 666.5	1 621.9	1 436.1	Mt CO_2-eq.	n.a.	n.a.
Share of EU ETS verified emissions in total GHG		41.2 %	40.9 %	38.9 %	%		
ETS verified emissions compared to annual allowances [7]		2.1 %	11.2 %	– 1.9 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 274.2	– 6.5 %	– 75.7	– 1.9 %	– 548.2	– 12.9 %	– 274.0	– 6.9 %
GHG per capita	– 1.6	– 13.4 %	– 0.3	– 2.5 %	– 2.3	– 19.8 %	– 0.7	– 6.9 %
EU ETS verified emissions - all installations			– 44.5	– 2.7 %			– 185.8	– 11.5 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 182.1	– 11.3 %

Assessment of long-term GHG trend (1990–2008)

Emissions have been declining steadily since 2003. Decreases in emissions between 1990 and 2008 were observed in all sectors except transport. The emission reductions that took place in (former Eastern) Germany in the early 1990s account for a significant part of the reductions observed at EU-15 level. Important emission reductions also took place in France and the United Kingdom during that period, in particular in energy industries, manufacturing industries and other energy sectors. In the United Kingdom this reduction in emissions was due to a switch from solid fuels to gaseous fuels. Improvements in energy efficiency and increased use of renewable sources have also contributed to lower emissions. This overall decrease was partly offset by the important emission increases in Spain and, to a lesser extent, Italy. Since 1990, international transport emissions have grown very rapidly and have reached about 6 % of total greenhouse gas emissions in the EU. Hydrofluorocarbons (HFCs) were tho only group of gases which increased between 1990 and 2008 due to increased production of cooling devices.

Assessment of short-term GHG trend (2007–2008)

All the main sectors reduced their greenhouse gas emissions in 2008 except households and services. Final energy consumption in households increased significantly, mainly due to an increased use of fuel for heating purposes, partly due to lower winter temperatures than in 2007 and to refilling of fuel stocks (fuel purchases were avoided in 2007 because of the high prices, particularly in Germany). Emissions from energy industries declined by around 5 %, largely due to a reduced use of coal for heat and power generation in the EU, partly caused by a fall in the relative price of gas and high carbon prices. Road transport emissions fell by almost 3 % in the context of very high international oil prices. Emissions from international aviation and maritime transport fell for the first time since 1992. Gasoline emissions continued their downward trend, whereas diesel emissions fell for the first time since 1990. Diesel price inflation outpaced the rapidly increasing gasoline prices. Along with the start of economic recession in the second half of 2008, this may have triggered a fall in freight transport demand, particularly in Spain.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

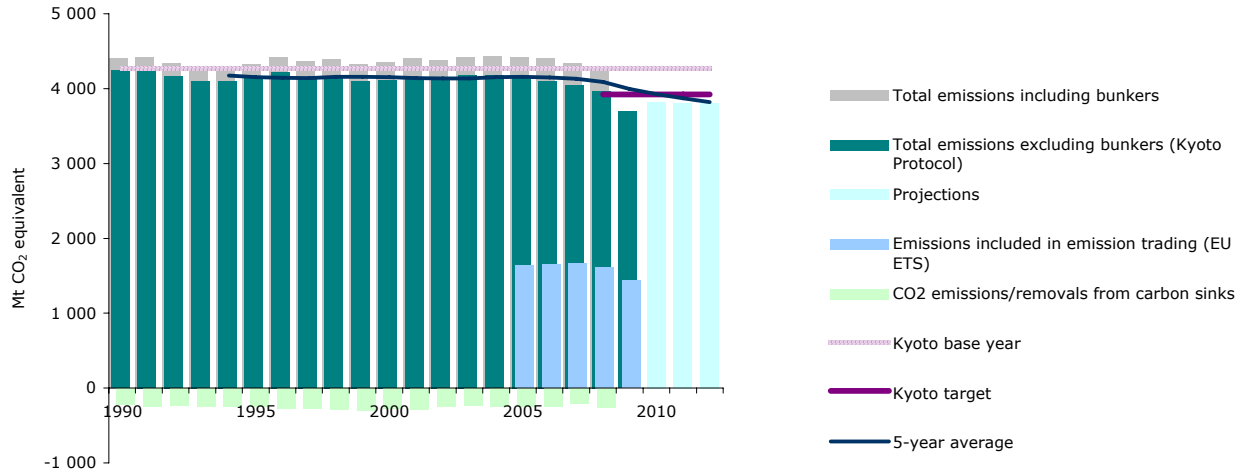
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

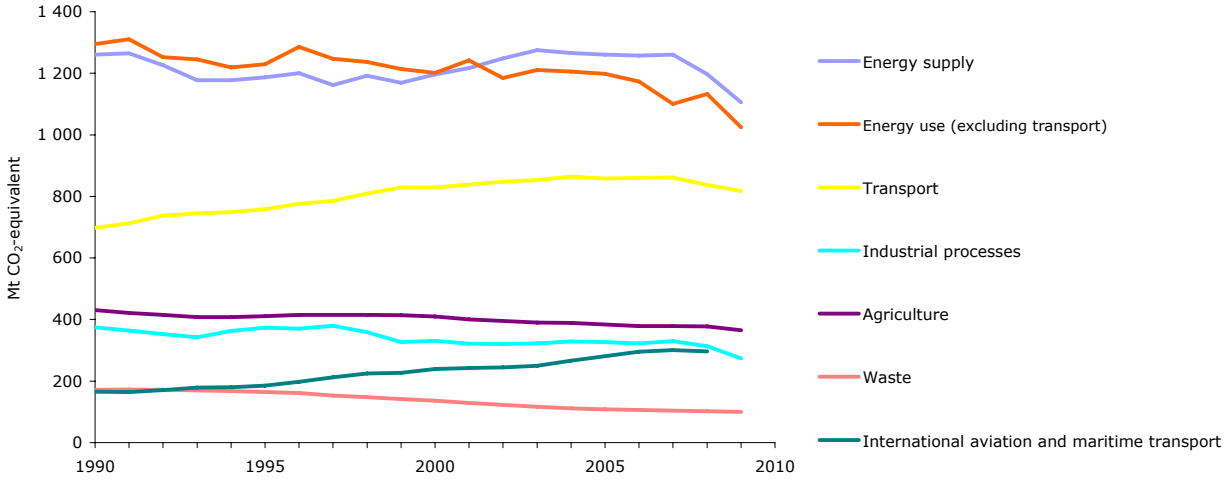
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends and projections 1990–2012 - total emissions and removals



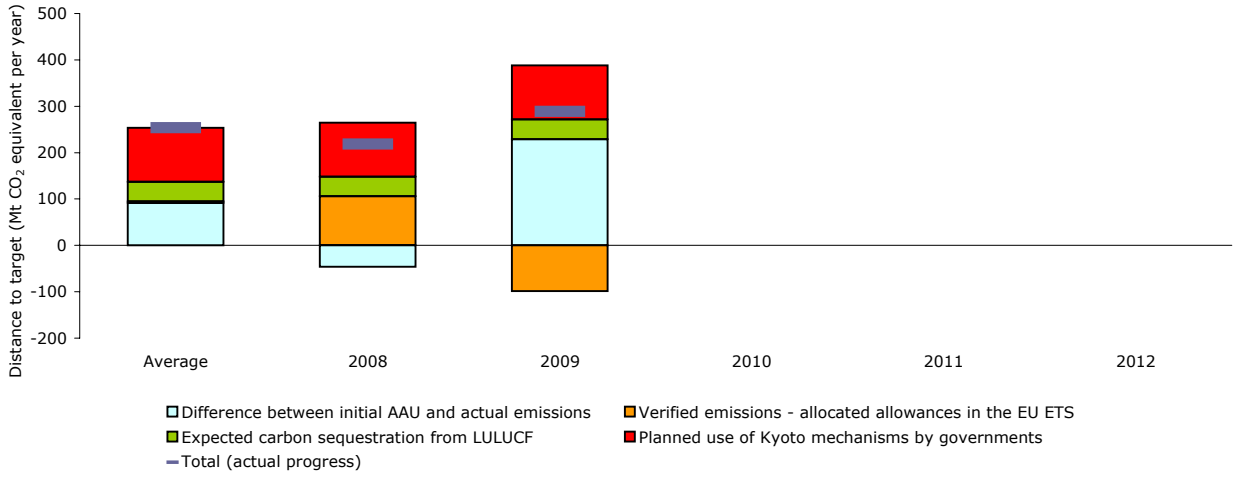
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Average emissions in EU-15 in 2008–2009 were 10.1 % lower than the base-year level, below the burden-sharing target of -8 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender more allowances than were issued to the EU ETS, increasing the countries assigned amount by 0.1 % of base-year level emissions. LULUCF activities are expected to decrease net emissions by 1 % of base-year level emissions per year. EU-15 intends to acquire allowances corresponding to 2.7 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in EU-15 stand currently below their target level, by a gap representing 5.9 % of the base-year emissions. Furthermore, projections published by the European Commission 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. These results rely on the assumption — which cannot be taken for granted — that the overachievement of their target by certain Member States could cover for any shortfall existing in other Member States.



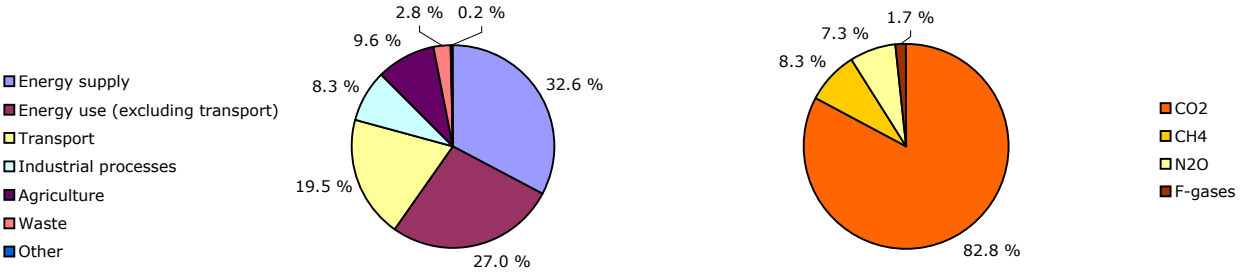
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in the EU-27

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	5 567.0	5 038.8	4 939.7	4 600.4	Mt CO_2-eq.	n.a.	n.a.
GHG from international bunkers [4]	175.4	313.3	309.6	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG per capita	11.8	10.2	9.9	9.2	t CO_2-eq. / capita	n.a.	n.a.
GHG per GDP [5]	n.a.	472	459	446	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 [6]		2 164.7	2 100.2	1 854.1	Mt CO_2-eq.	n.a.	n.a.
Share of EU ETS verified emissions in total GHG		43.0 %	42.5 %	40.3 %	%		
ETS verified emissions compared to annual allowances [7]		0.5 %	7.7 %	– 5.4 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 627.3	– 11.3 %	– 99.0	– 2.0 %	– 966.6	– 17.4 %	– 339.4	– 6.9 %
GHG per capita	– 1.9	– 15.9 %	– 0.2	– 2.4 %	– 2.6	– 22.0 %	– 0.7	– 6.9 %
EU ETS verified emissions - all installations			– 64.5	– 3.0 %			– 246.2	– 11.7 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 237.1	– 11.4 %

Assessment of long-term GHG trend (1990–2008)

Emissions have been declining steadily since 2003. Decreases in emissions between 1990 and 2008 were observed in all sectors except transport. The emission reductions that took place in Eastern European countries in the early 1990s account for a significant part of the reductions observed at EU level. Important emission reductions also took place in France and the United Kingdom during that period, in particular in energy industries, manufacturing industries and other energy sectors. In the United Kingdom this reduction in emissions was due to a switch from solid fuels to gaseous fuels. Improvements in energy efficiency and increased use of renewable sources have also contributed to lower emissions. This overall decrease was partly offset by the important emission increases in Spain and, to a lesser extent, Italy. Since 1990, international transport emissions have grown very rapidly and have reached about 6 % of total greenhouse gas emissions in the EU. Hydrofluorocarbons (HFCs) were tho only group of gases which increased between 1990 and 2008 due to increased production of cooling devices.

Assessment of short-term GHG trend (2007–2008)

All the main sectors reduced their greenhouse gas emissions in 2008 except households and services. The combination of high coal and carbon prices accompanied by a drop in natural gas prices in 2008 induced heat and electricity producers to replace more polluting coal by gas and as a result, reduce their GHG emissions. The use of biomass and other renewable sources (wind and hydroelectric power) has also increased significantly in 2008. The economic recession, which started during the second half of the year, also contributed to emission reductions from several sectors including the manufacturing and construction, and road transport sectors. Road transport emissions were also affected by high oil prices, the continued decline in gasoline consumption and a reversal of the upward trend in diesel sales. Emissions from international aviation and maritime transport fell for the first time since 1992. Final energy consumption in households increased significantly, mainly due to an increased use of fuel for heating purposes, due to lower winter temperatures than in 2007, and to refilling of fuel stocks (fuel purchases were avoided in 2007 because of the high prices).

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

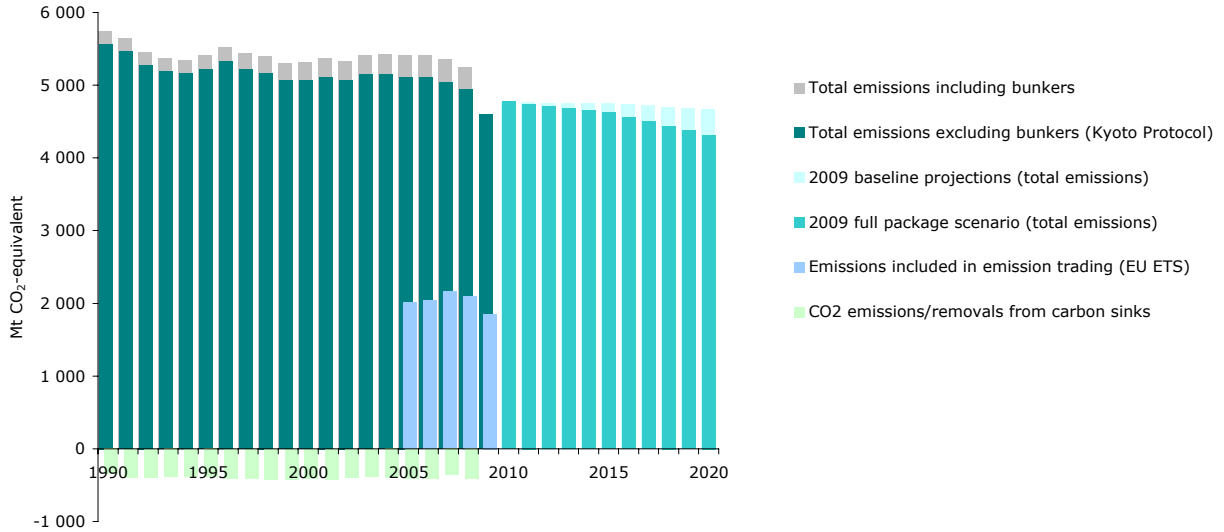
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

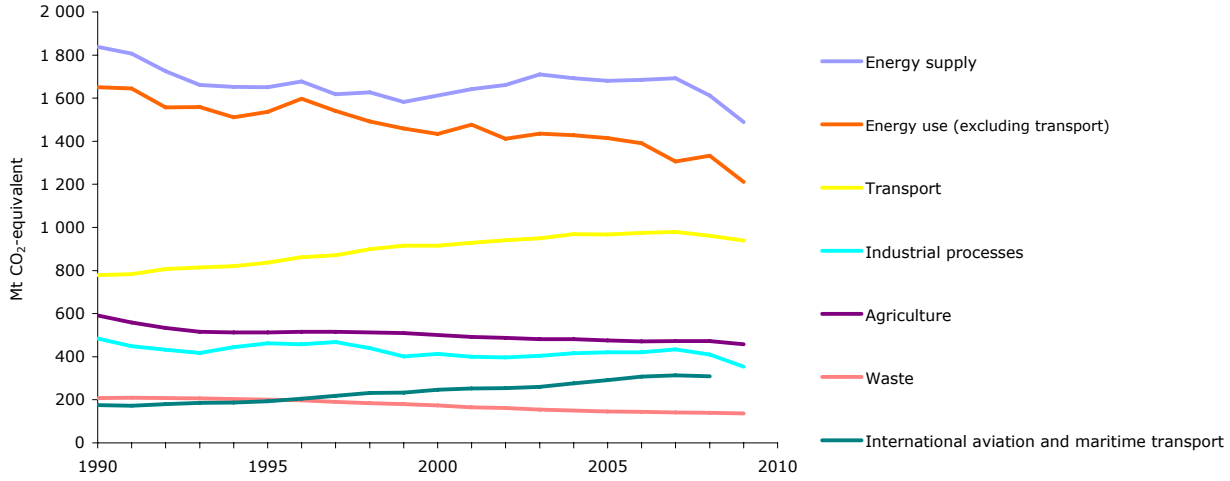
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends and projections 1990–2020 - total emissions and removals



GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

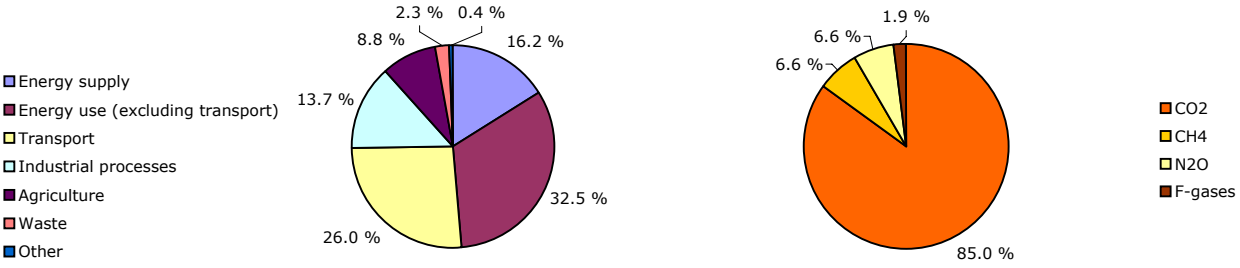
The EU-27 does not have a target under the Kyoto Protocol. Although it can be expected that recent emission trends level off or are even reversed temporarily as the economy picks up again, projections from the European Commission show that the EU-27 is expected to achieve its 20 % reduction commitment by 2020 through domestic action alone, provided that Member States implement fully the Climate and Energy Package.

GHG trends and projections in Austria

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	78.2	87.0	86.6	n.a.	Mt CO_2-eq.	12	9
GHG from international bunkers [4]	0.9	2.2	2.2	n.a.	Mt CO_2-eq.	16	14
GHG per capita	10.2	10.5	10.4	n.a.	t CO_2-eq. / capita	13	9
GHG per GDP [5]	483	361	353	n.a.	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	1.4 %	1.7 %	1.8 %	n.a.	%		
EU ETS verified emissions [6]		31.8	32.0	27.3	Mt CO_2-eq.	14	10
Share of EU ETS verified emissions in total GHG		36.5 %	36.9 %	n.a.	%		
ETS verified emissions compared to annual allowances [7]		– 2.9 %	6.1 %	– 15.7 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	8.5	10.8 %	– 0.3	– 0.4 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
GHG per capita	0.2	1.9 %	– 0.1	– 0.8 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
EU ETS verified emissions - all installations			0.3	0.8 %			– 4.7	– 14.7 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 4.7	– 14.7 %

Assessment of long-term GHG trend (1990–2008)

Emissions have overall increased since 1990, although data for recent years indicate a downward trend since 2005. The 19 % increase in CO2 emissions was mainly due to very significant increases in the transport sector (+ 60.8 % in emissions), although here also emissions have started levelling off since 2005. Methane emissions decreased by 31 %, mainly due to lower emissions from solid waste disposal, while N2O emissions decreased by 8.3 % due to lower emissions from agricultural soils and emission reduction measures in the chemical industry. HFC emissions are 39 times higher in 2008 than in 1990, whereas PFC and SF6 emissions decreased by 83.9 % and 22.8 % over the period.

Assessment of short-term GHG trend (2007–2008)

Following an overall increase between 1999 and 2005, emissions decreased for the third consecutive year. The key drivers for the slight downward trend in total emissions were the decreasing amount of fuel consumed in road transport and the reduced use of liquid and solid fuels by energy industries for the production of electrical power and district heating. Those emission reductions were counterbalanced by increasing emissions, in particular from household and services, where they rose by 9.6 % compared to 2007 due to higher heat demand.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

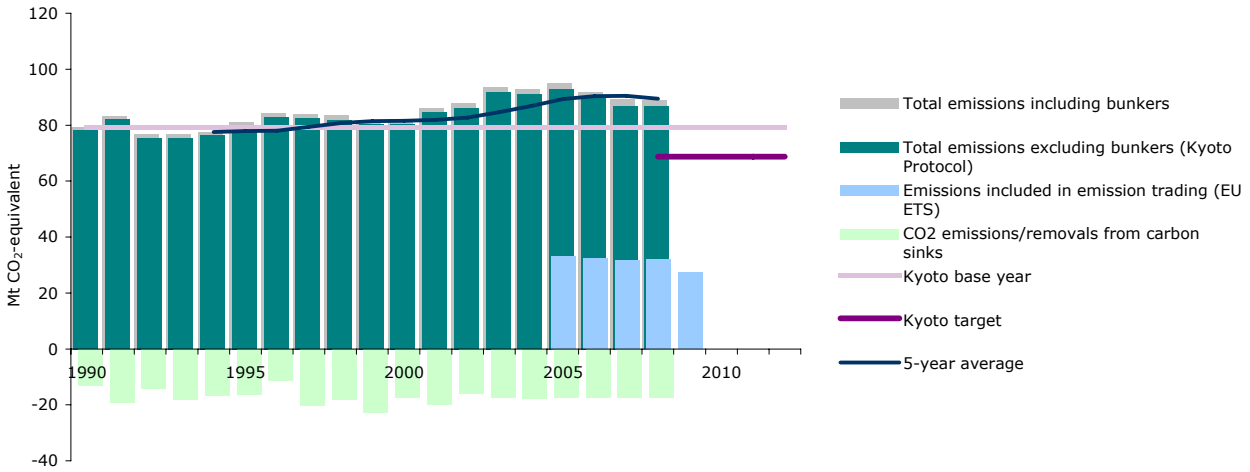
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

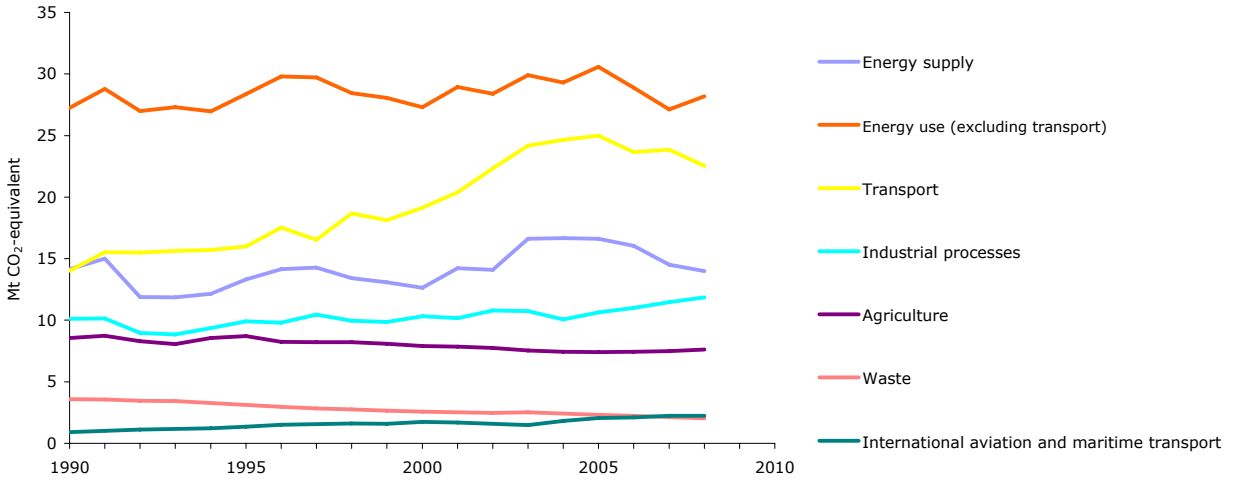
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2008 - total emissions and removals



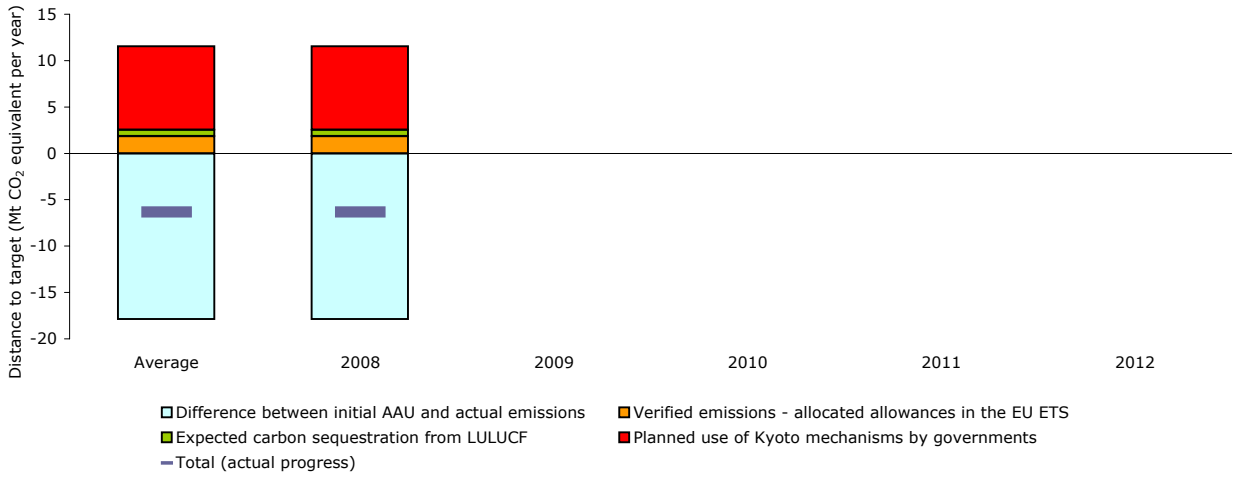
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in Austria in 2008 were 9.6 % higher than the base-year level, significantly above the burden-sharing target of -13 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender more allowances than were issued to the EU ETS, increasing the countries assigned amount by 2.3 % of base-year level emissions. LULUCF activities are expected to decrease net emissions by 0.9 % of base-year level emissions per year. Austria intends to acquire allowances corresponding to 11.4 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Austria stand currently above their target level, by a gap representing 8 % of the base-year emissions.



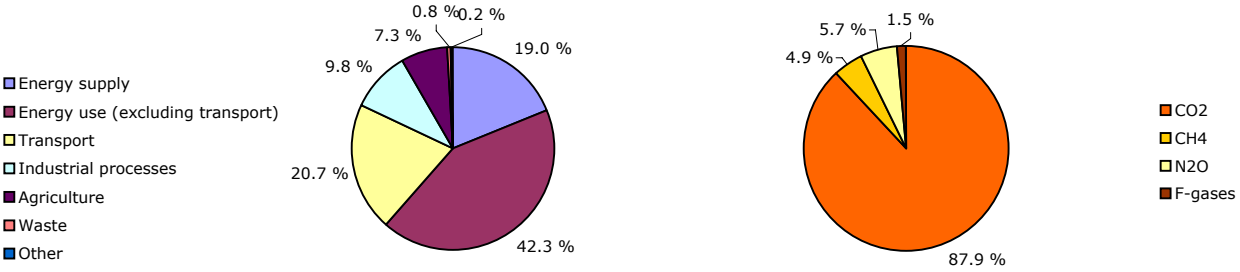
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Belgium

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	143.4	130.2	133.3	n.a.	Mt CO_2-eq.	10	7
GHG from international bunkers [4]	16.4	34.2	33.4	n.a.	Mt CO_2-eq.	5	5
GHG per capita	14.4	12.3	12.5	n.a.	t CO_2-eq. / capita	8	5
GHG per GDP [5]	708	451	457	n.a.	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	2.6 %	2.6 %	2.7 %	n.a.	%		
EU ETS verified emissions [6]		52.8	55.5	46.2	Mt CO_2-eq.	11	8
Share of EU ETS verified emissions in total GHG		40.5 %	41.6 %	n.a.	%		
ETS verified emissions compared to annual allowances [7]		– 12.6 %	0.1 %	– 18.6 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 10.1	– 7.1 %	3.0	2.3 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
GHG per capita	– 1.9	– 13.3 %	0.2	1.5 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
EU ETS verified emissions - all installations			2.7	5.1 %			– 9.3	– 16.7 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 9.4	– 16.9 %

Assessment of long-term GHG trend (1990–2008)

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 combined with an increase of emissions from buildings in the commercial sector, which was counterbalanced by emission reductions in the other sectors, particularly energy use from manufacturing industries and energy supply.

Assessment of short-term GHG trend (2007–2008)

Emissions increased mainly due to road transport and energy use from households. The latter can be partly attributed to a colder winter (heating degree days increased by 11.1 %). This increase was partly offset by decreases in emissions from thermal power production.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

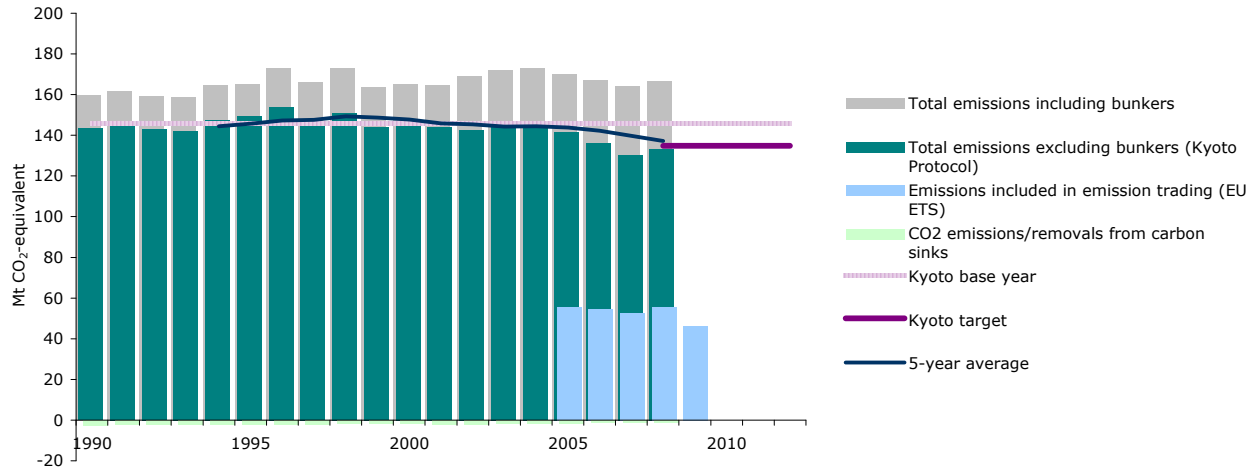
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

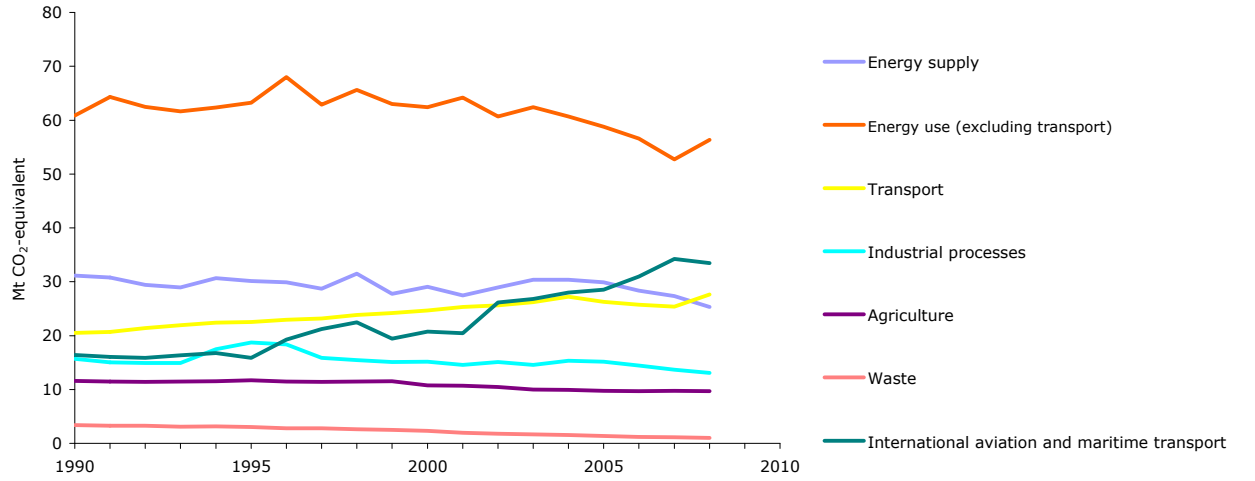
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2008 - total emissions and removals



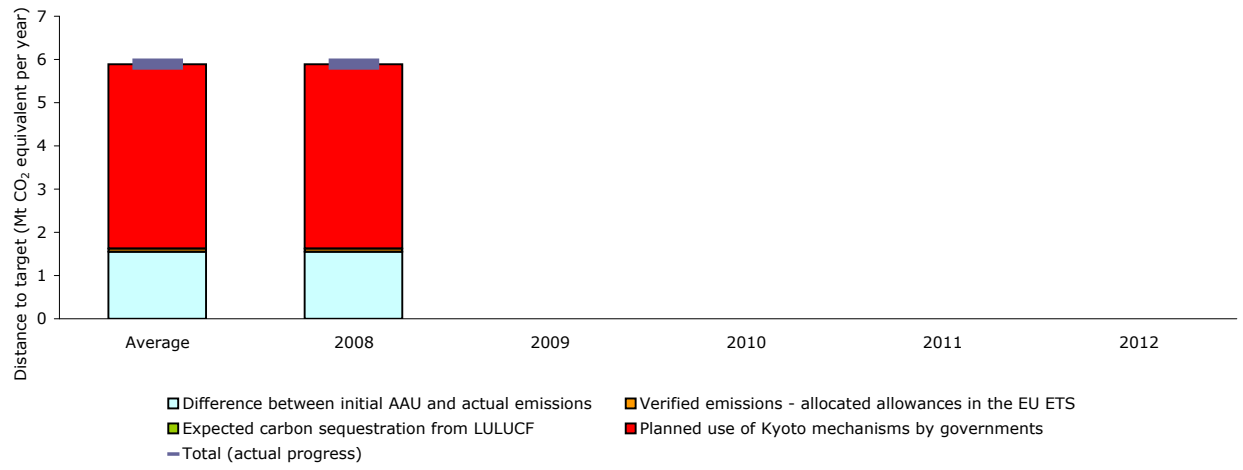
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in Belgium in 2008 were 8.6 % lower than the base-year level, below the burden-sharing target of -7.5 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender more allowances than were issued to the EU ETS, increasing the countries assigned amount by 0.1 % of base-year level emissions. Belgium intends to acquire allowances corresponding to 2.9 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Belgium stand currently below their target level, by a gap representing 4 % of the base-year emissions.



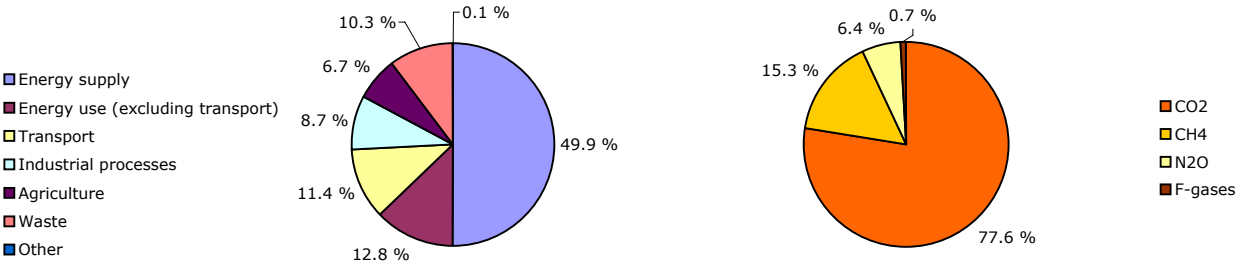
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Bulgaria

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	117.4	75.9	73.5	n.a.	Mt CO_2-eq.	14	n.a.
GHG from international bunkers [4]	1.8	0.7	0.9	n.a.	Mt CO_2-eq.	22	n.a.
GHG per capita	13.4	9.9	9.6	n.a.	t CO_2-eq. / capita	16	n.a.
GHG per GDP [5]	n.a.	3 793	3 462	n.a.	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	2.1 %	1.5 %	1.5 %	n.a.	%		
EU ETS verified emissions [6]		39.2	38.3	32.0	Mt CO_2-eq.	12	n.a.
Share of EU ETS verified emissions in total GHG		51.6 %	52.1 %	n.a.	%		
ETS verified emissions compared to annual allowances [7]		n.a.	0.0 %	– 21.1 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 43.9	– 37.4 %	– 2.4	– 3.2 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
GHG per capita	– 3.8	– 28.2 %	– 0.3	– 2.7 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
EU ETS verified emissions - all installations			n.a.	n.a.			– 6.3	– 16.5 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 6.3	– 16.5 %

Assessment of long-term GHG trend (1990–2008)

Emissions decreased sharply in the 1990s in all sectors due to economic restructuring and have remained relatively stable since 1999. Remarkable emission decreases occurred in the production of public electricity and heat, in manufacturing industries and in chemical industries. In the agriculture sector emissions reduced by over 60 %. In the waste sector, emission reductions occurred due to better solid waste management.

Assessment of short-term GHG trend (2007–2008)

Emission reductions tool places mainly in the industry sector (in particular in iron and steel production). The emission decreases were partly offset by emission increases from public electricity and heat production, mainly due to increased coal consumption in thermal power plants.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

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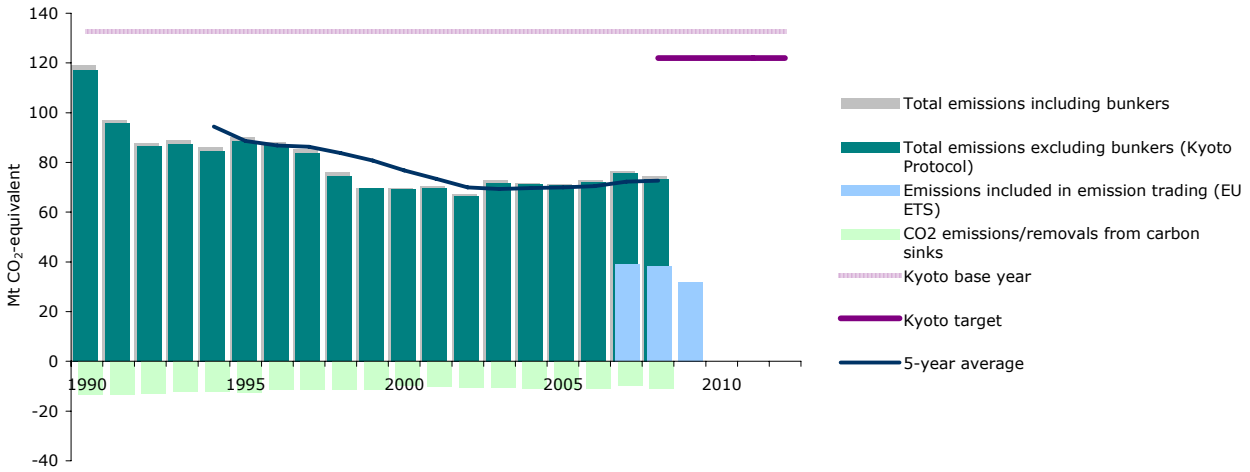
[7] "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

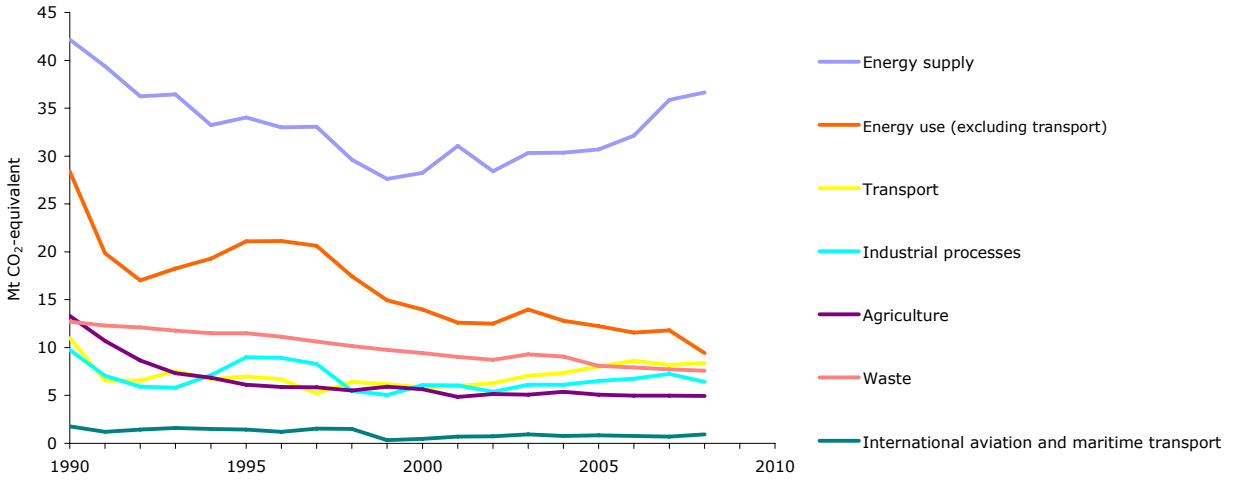
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2008 - total emissions and removals



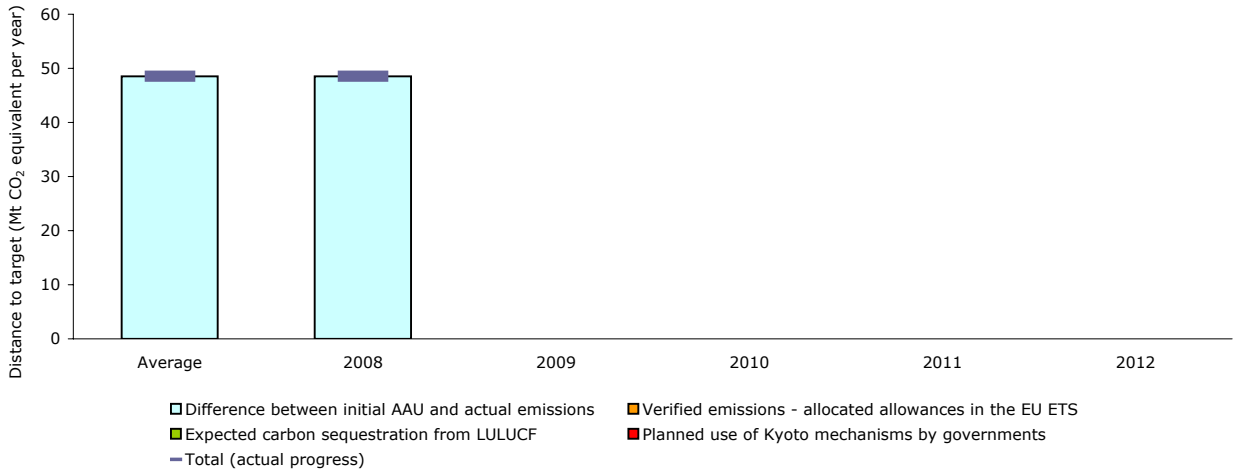
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in Bulgaria in 2008 were 44.6 % lower than the base-year level, well below the Kyoto target of -8 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender more allowances than were issued to the EU ETS, increasing the countries assigned amount by 0.00005 % of base-year level emissions. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Bulgaria stand currently below their target level, by a gap representing 36.6 % of the base-year emissions.



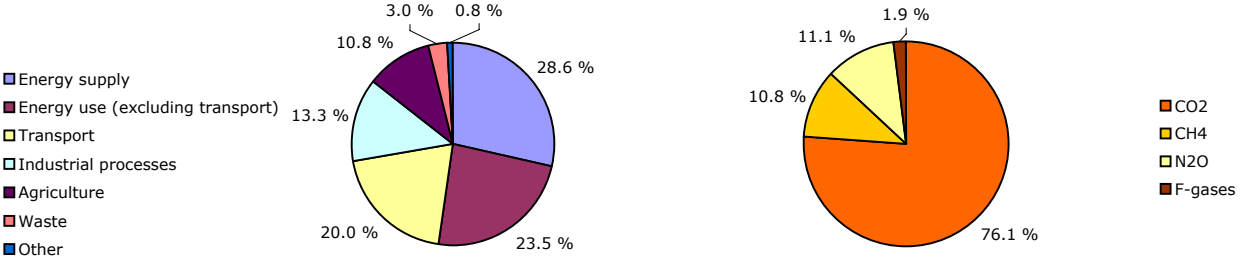
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Croatia

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	31.4	32.3	31.1	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	7.3	7.0	n.a.	t CO_2-eq. / capita	n.a.	n.a.
GHG per GDP [5]	n.a.	1 012	954	n.a.	g CO_2-eq. / euro		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 0.3	– 0.9 %	– 1.1	– 3.6 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
GHG per capita	0.4	6.6 %	– 0.3	– 3.5 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*

Assessment of long-term GHG trend (1990–2008)

Overall decline of economic activities and energy consumption in the period 1991-1994, which was mainly the consequence of the war in Croatia, had directly caused the decline in total emissions of greenhouse gases in that period. With the entire national economy in transition process, some energy intensive industries reduced their activities or phased out certain productions (e.g. blast furnaces, primary aluminium production, coke plant). Emissions have started to increase in 1995 at an average rate of 3 percent per year, until 2007. Emissions have been reduced by 3.6 percent in 2008 regarding 2007. 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.

Assessment of short-term GHG trend (2007–2008)

The decrease in GHG emission is mainly due to favourable hydrological conditions which led to increase utilisation of hydropower by 27.0 %, as well as a slight decrease in cement and lime production. Road transport emissions decreased for the first time since 1992.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

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[2] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 values, 1 = highest value among EU countries.

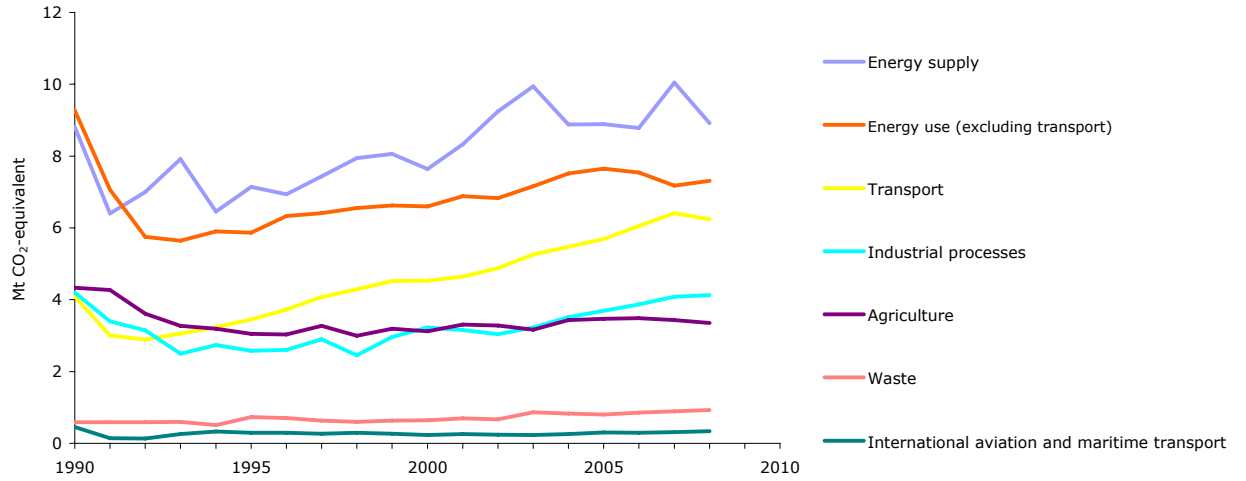
[4] International bunkers: international aviation and international maritime transport.

[5] GDP in constant 2000 prices - not suitable for a quantitative comparison between countries for the same year.

[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

GHG trends 1990–2008 - total emissions and removals

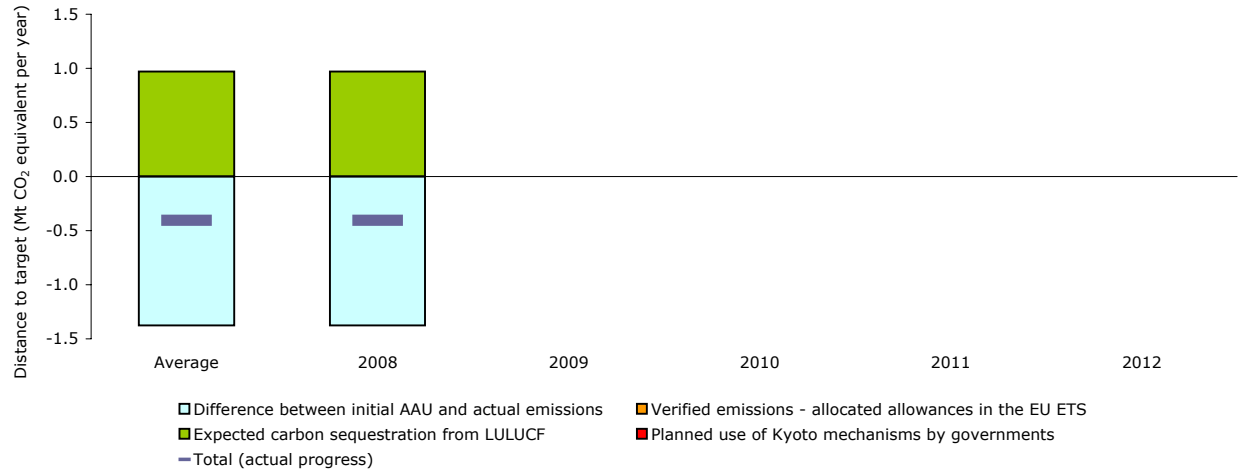
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in Croatia in 2008 were 0.6 % 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 3.1 % of base-year level emissions. Taking all these effects in to account, emissions in Croatia stand currently above their target level, by a gap representing 1.3 % of the base-year emissions.



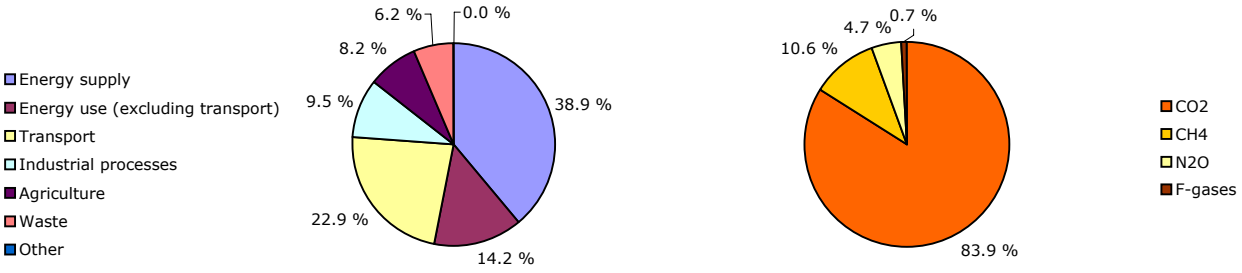
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Cyprus

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	5.3	9.9	10.2	n.a.	Mt CO_2-eq.	26	n.a.
GHG from international bunkers [4]	0.9	1.5	1.3	n.a.	Mt CO_2-eq.	18	n.a.
GHG per capita	9.2	12.7	12.9	n.a.	t CO_2-eq. / capita	6	n.a.
GHG per GDP [5]	816	762	762	n.a.	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	0.1 %	0.2 %	0.2 %	n.a.	%		
EU ETS verified emissions [6]		5.4	5.6	0.1	Mt CO_2-eq.	24	n.a.
Share of EU ETS verified emissions in total GHG		54.8 %	54.6 %	n.a.	%		
ETS verified emissions compared to annual allowances [7]		– 8.5 %	15.8 %	– 98.2 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	4.9	93.9 %	0.4	3.7 %	n.a.	n.a.	n.a.	n.a.
GHG per capita	3.7	40.7 %	0.3	2.3 %	n.a.	n.a.	n.a.	n.a.
EU ETS verified emissions - all installations			0.2	3.3 %			– 5.5	– 98.5 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 0.05	– 37.2 %

Assessment of long-term GHG trend (1990–2008)

Except for brief periods of decreases (1995) or 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 is mainly due to public electricity and heat production (+132 %) as well as emissions from road transport (+198 %). Emissions from industrial processes (+45 %), agriculture (+29 %) and waste (+61 %) increased as well.

Assessment of short-term GHG trend (2007–2008)

The increase in emissions results from increased use of liquid fuels in public electricity and heat production and road transport. HFC emissions from refrigeration and air conditioning nearly tripled. CH4 emissions from manure management also contributed to the emission increase.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

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[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

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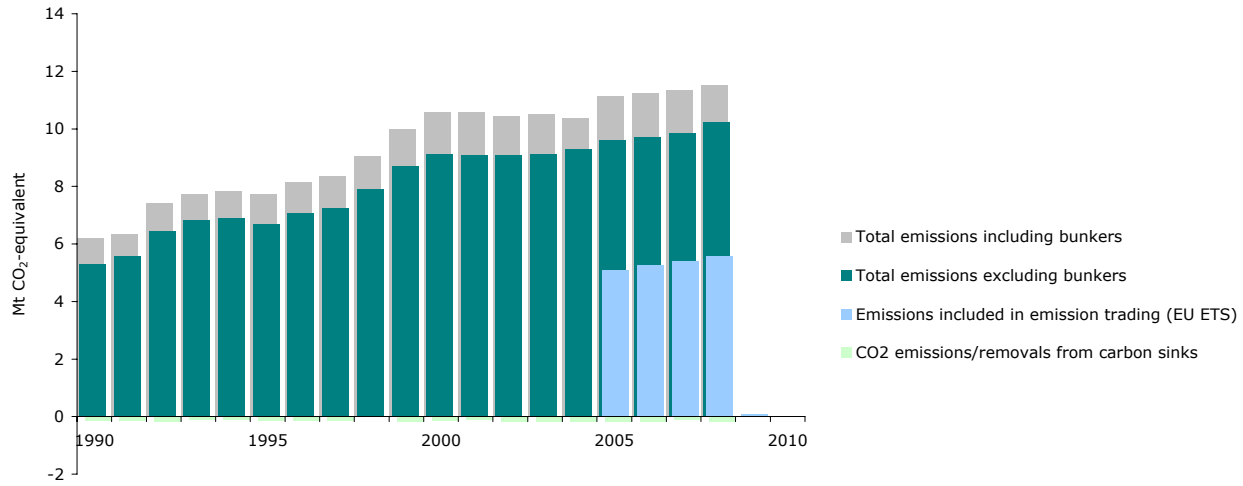
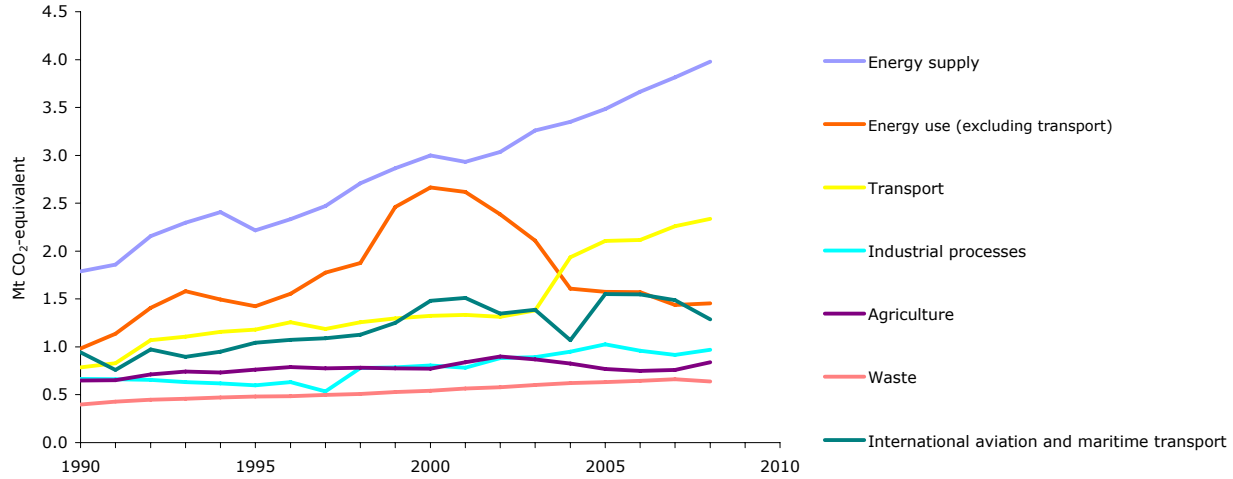
[7] "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

GHG trends 1990–2008 - total emissions and removals



GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

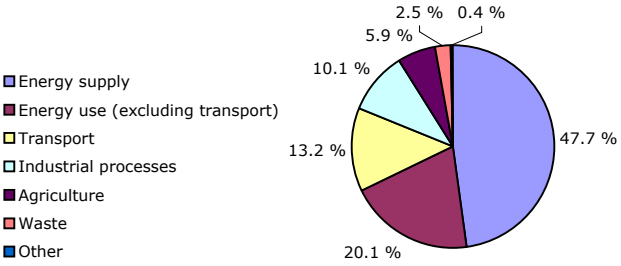
Cyprus does not have a target under the Kyoto Protocol.

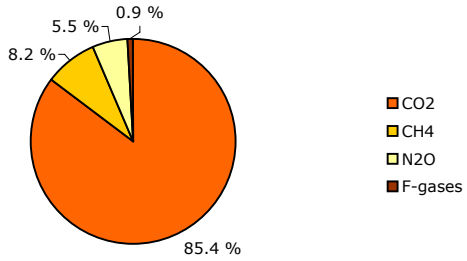
GHG trends and projections in the Czech Republic

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	195.2	147.5	141.4	n.a.	Mt CO_2-eq.	9	n.a.
GHG from international bunkers [4]	0.6	1.1	1.2	n.a.	Mt CO_2-eq.	19	n.a.
GHG per capita	18.8	14.3	13.6	n.a.	t CO_2-eq. / capita	4	n.a.
GHG per GDP [5]	3 256	1 761	1 648	n.a.	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	3.5 %	2.9 %	2.9 %	n.a.	%		
EU ETS verified emissions [6]		87.8	80.4	73.8	Mt CO_2-eq.	8	n.a.
Share of EU ETS verified emissions in total GHG		59.6 %	56.9 %	n.a.	%		
ETS verified emissions compared to annual allowances [7]		– 9.4 %	– 6.0 %	– 14.1 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]





Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 53.8	– 27.5 %	– 6.1	– 4.1 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
GHG per capita	– 5.2	– 27.7 %	– 0.7	– 5.0 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
EU ETS verified emissions - all installations			– 7.4	– 8.5 %			– 6.6	– 8.3 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 6.6	– 8.3 %

Assessment of long-term GHG trend (1990–2008)

Total emissions strongly decreased in the early 1990s due to the economic restructuring (transition to the market economy), but have remained relatively stable since 2000. The decrease affected primarily the energy sector (– 27 %), due to lower fuel consumption in manufacturing industry and in households and by switching from coal to natural gas. On the other hand, emissions from transport more than doubled – an increase which was overall practically compensated by the decrease in agricultural emissions and emissions from industrial processes.

Assessment of short-term GHG trend (2007–2008)

Emissions decreased between 2007 and 2008, affected by the effects of the economic crisis. Emissions from public electricity and heat production and from manufacturing industries decreased. Furthermore, transport emissions decreased for the first time since 1993.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

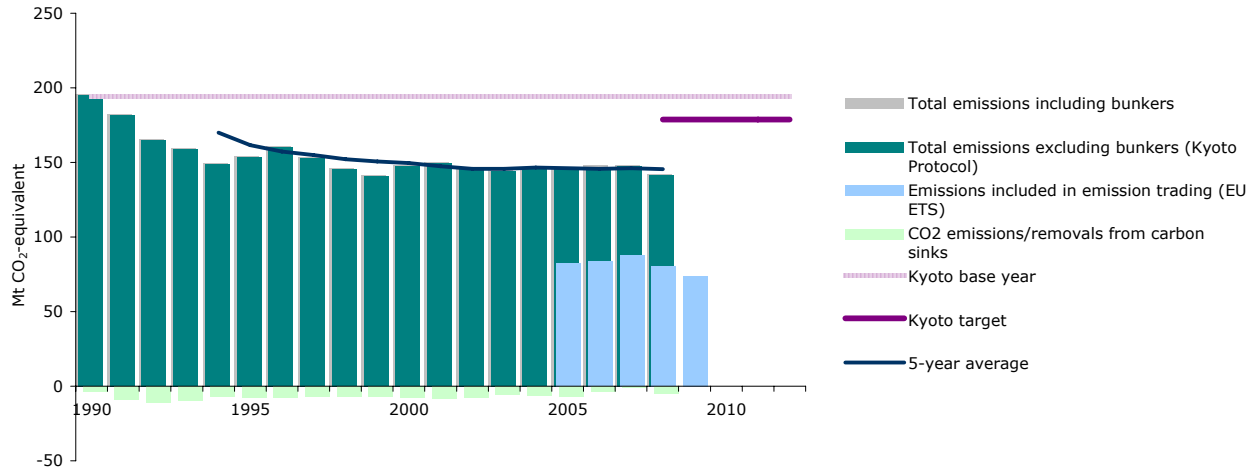
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

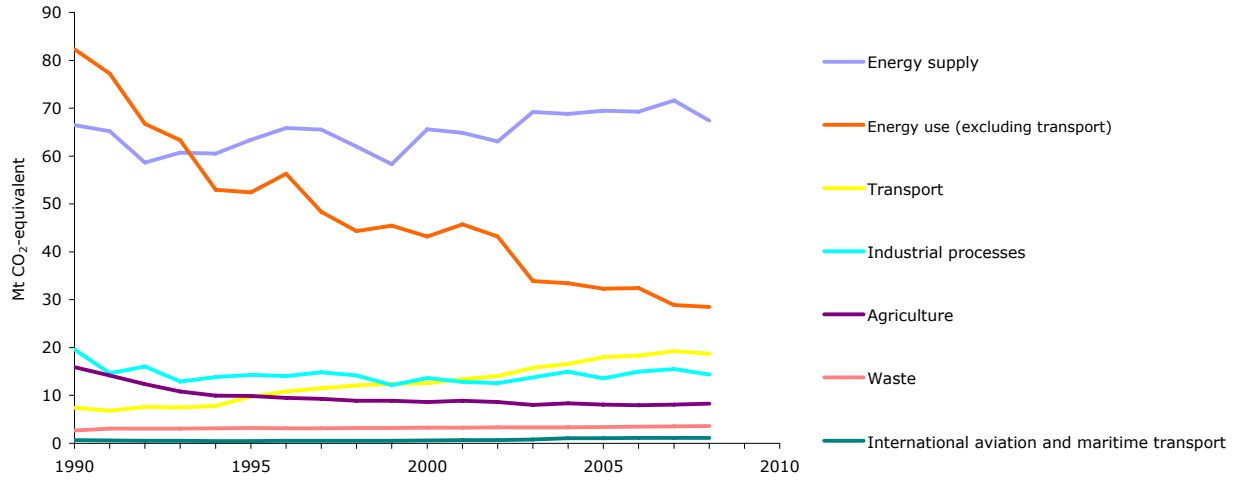
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2008 - total emissions and removals



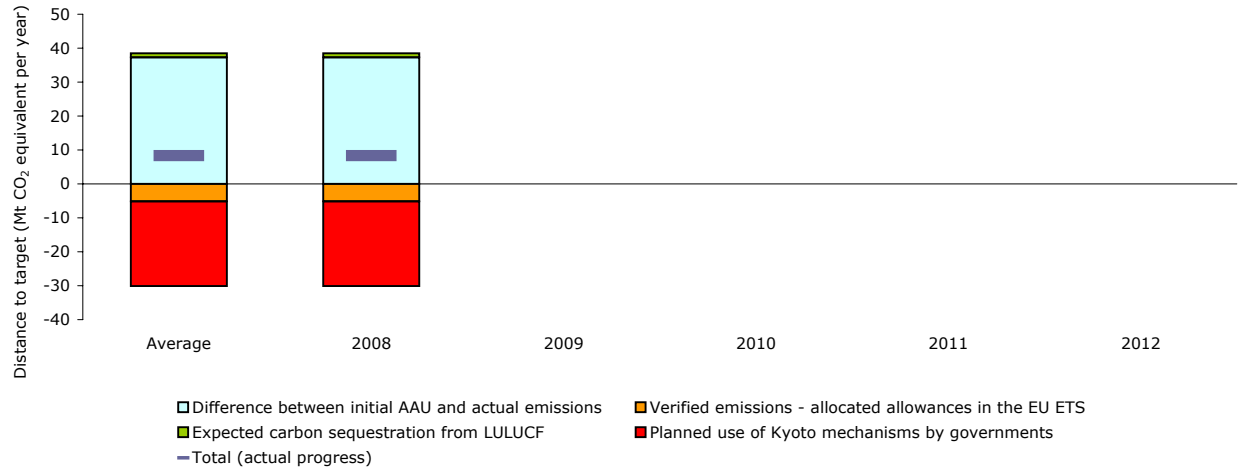
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in Czech Republic in 2008 were 27.2 % lower than the base-year level, well below the Kyoto target of -8 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender less allowances than were issued to the EU ETS, decreasing the countries assigned amount by 2.7 % of base-year level emissions. LULUCF activities are expected to decrease net emissions by 0.6 % of base-year level emissions. Czech Republic intends to sell allowances corresponding to 12.9 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Czech Republic stand currently below their target level, by a gap representing 4.3 % of the base-year emissions.



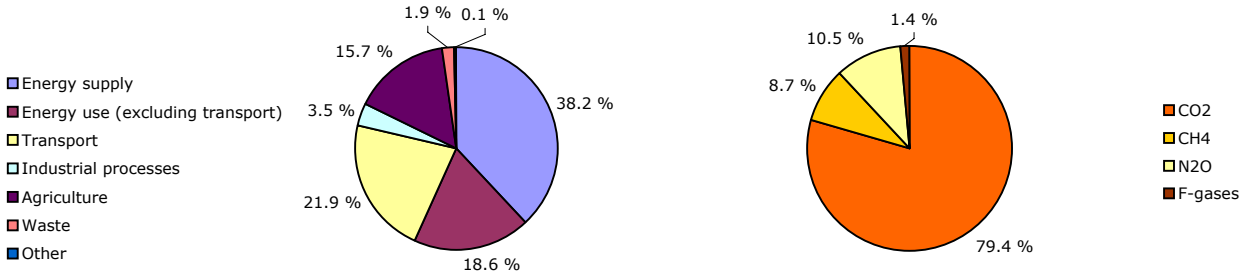
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Denmark

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	68.9	66.8	63.8	62.1	Mt CO_2-eq.	19	14
GHG from international bunkers [4]	4.9	6.3	5.9	n.a.	Mt CO_2-eq.	10	10
GHG per capita	13.4	12.3	11.7	11.3	t CO_2-eq. / capita	9	6
GHG per GDP [5]	513	344	332	339	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 [6]		29.4	26.5	25.5	Mt CO_2-eq.	17	12
Share of EU ETS verified emissions in total GHG		44.0 %	41.6 %	41.0 %	%		
ETS verified emissions compared to annual allowances [7]		5.4 %	10.7 %	6.5 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 5.1	– 7.4 %	– 3.0	– 4.5 %	– 6.8	– 9.9 %	– 1.7	– 2.7 %
GHG per capita	– 1.8	– 13.1 %	– 0.6	– 5.0 %	– 2.1	– 16.0 %	– 0.4	– 2.7 %
EU ETS verified emissions - all installations			– 2.9	– 9.7 %			– 1.1	– 4.1 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 1.1	– 4.1 %

Assessment of long-term GHG trend (1990–2008)

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 large imports of electricity. Overall, CO2 energy-related emissions decreased by 10 % from 1990 to 2008. The increasing use of gas engines in decentralised cogeneration plants resulted in an increase of CH4 emissions, although emission reductions were also observed in later years due to the liberalisation of the electricity market. CO2 emission from the transport sector increased by 31 % from 1990 to 2008, mainly due to increasing road traffic. CO2 emission from cement production increased by 24 % from 1990 to 2008. The second largest source in emissions from industrial processes was N2O from the production of nitric acid, until that production ceased in 2004. Emissions of N2O and CH4 in the agriculture sector were reduced from 1990 to 2008. In the waste sector, emissions decreased as a combined result of improved waste management (reduced landfilled waste) and upgrade of wastewater treatment plants, despite higher industrial load to wastewater systems.

Assessment of short-term GHG trend (2007–2008)

Emissions decreased for the second consecutive year. The annual decrease is related to the decrease in total electricity generation in conventional thermal power plants and increased imports of electricity, which resulted in lower emissions from public electricity and heat production. Transport emissions decreased for the first time since 2001.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

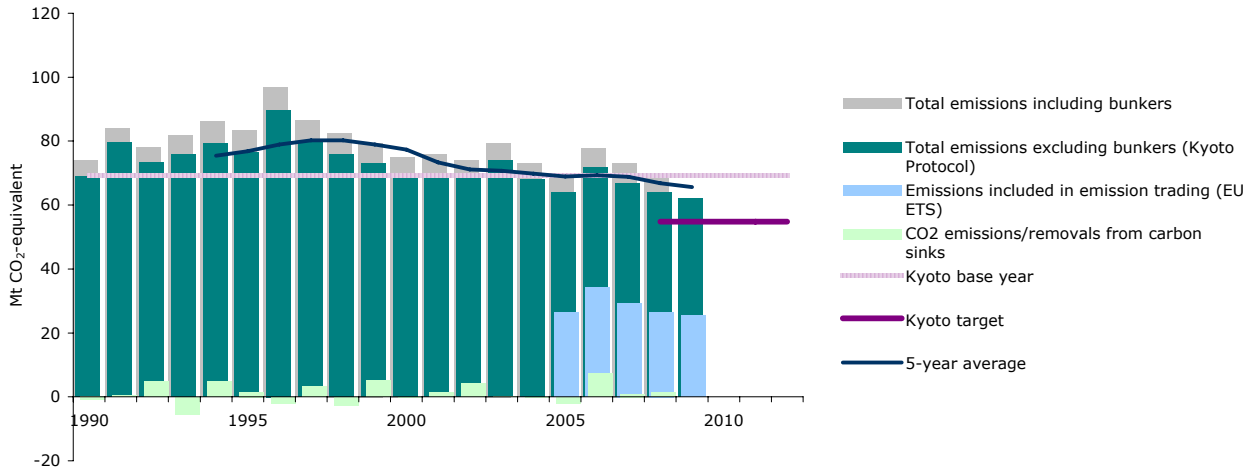
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

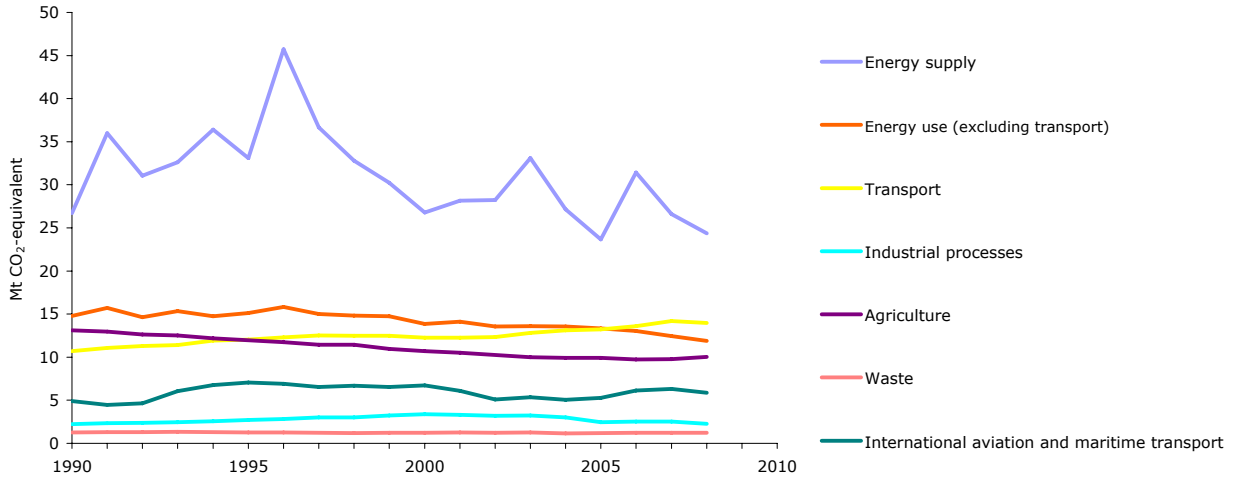
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2009 - total emissions and removals



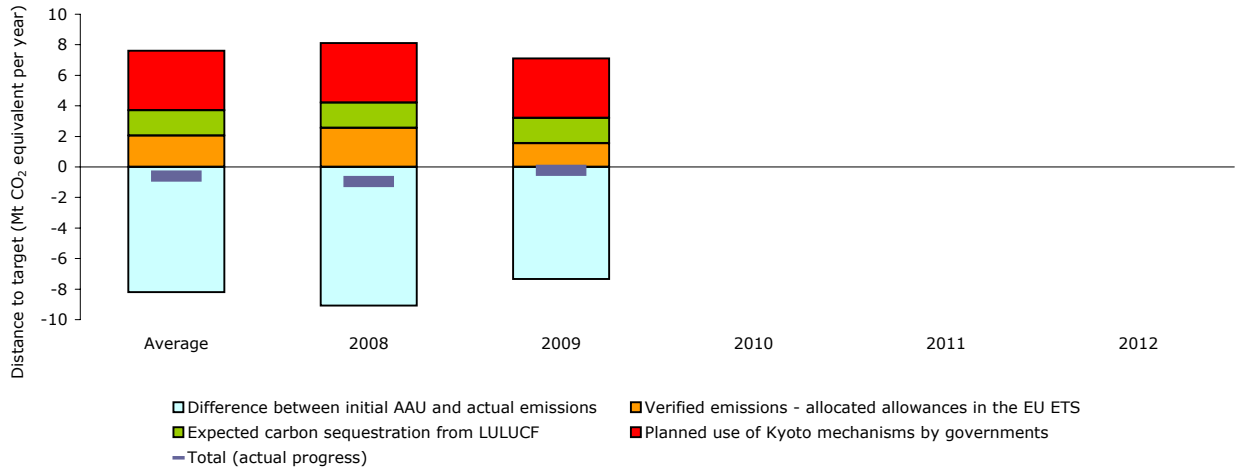
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Average emissions in Denmark in 2008–2009 were 9.2 % lower than the base-year level, significantly above the burden-sharing target of -21 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender more allowances than were issued to the EU ETS, increasing the countries assigned amount by 3 % of base-year level emissions. LULUCF activities are expected to decrease net emissions by 2.4 % of base-year level emissions. Denmark intends to acquire allowances corresponding to 5.6 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Denmark stand currently above their target level, by a gap representing 0.9 % of the base-year emissions.However, according to recent projections from Denmark, further emission reductions are projected until 2012 and will allow Denmark to meet its burden-sharing target.



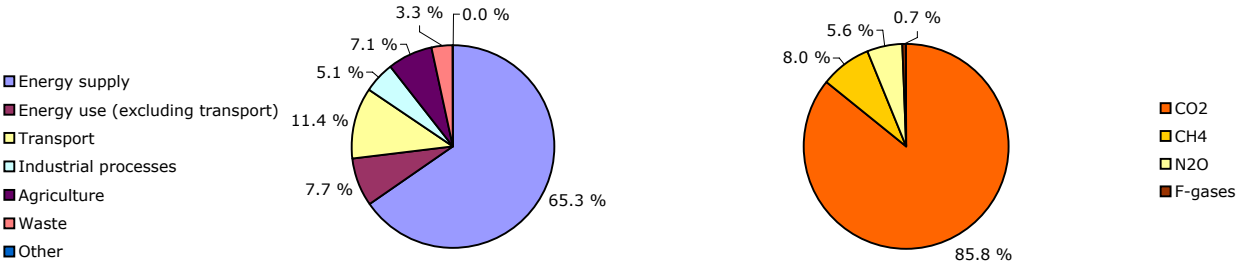
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Estonia

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	40.8	22.1	20.3	n.a.	Mt CO_2-eq.	23	n.a.
GHG from international bunkers [4]	0.7	0.9	0.9	n.a.	Mt CO_2-eq.	23	n.a.
GHG per capita	26.0	16.4	15.1	n.a.	t CO_2-eq. / capita	3	n.a.
GHG per GDP [5]	n.a.	2 074	1 975	n.a.	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	0.7 %	0.4 %	0.4 %	n.a.	%		
EU ETS verified emissions [6]		15.3	13.5	10.3	Mt CO_2-eq.	21	n.a.
Share of EU ETS verified emissions in total GHG		69.5 %	66.9 %	n.a.	%		
ETS verified emissions compared to annual allowances [7]		– 28.2 %	15.9 %	– 12.9 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 20.6	– 50.4 %	– 1.8	– 8.2 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
GHG per capita	– 10.9	– 41.9 %	– 1.3	– 8.1 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
EU ETS verified emissions - all installations			– 1.8	– 11.7 %			– 3.2	– 23.8 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 3.2	– 23.8 %

Assessment of long-term GHG trend (1990–2008)

The decrease in total emissions was mainly caused by the transition from planned economy to market economy and successful implementation of necessary reforms, after Estonia became independent in 1991. Over the period 1990–2008, energy-related emissions decreased by 52.6 %, mainly due to reduced fuel consumption by energy industries (closing of the factories). Emissions from the agriculture fell by 52.6 % and waste emissions decreased by 3.3 %. During the same period, emissions from industrial processes sector increased by 0.6 %.

Assessment of short-term GHG trend (2007–2008)

Emissions were reduced due to a 14 % decrease of electricity generation in conventional thermal Power plants, which resulted in lower emissions from public electricity and heat production. Electricity exports also decreased compared to 2007.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

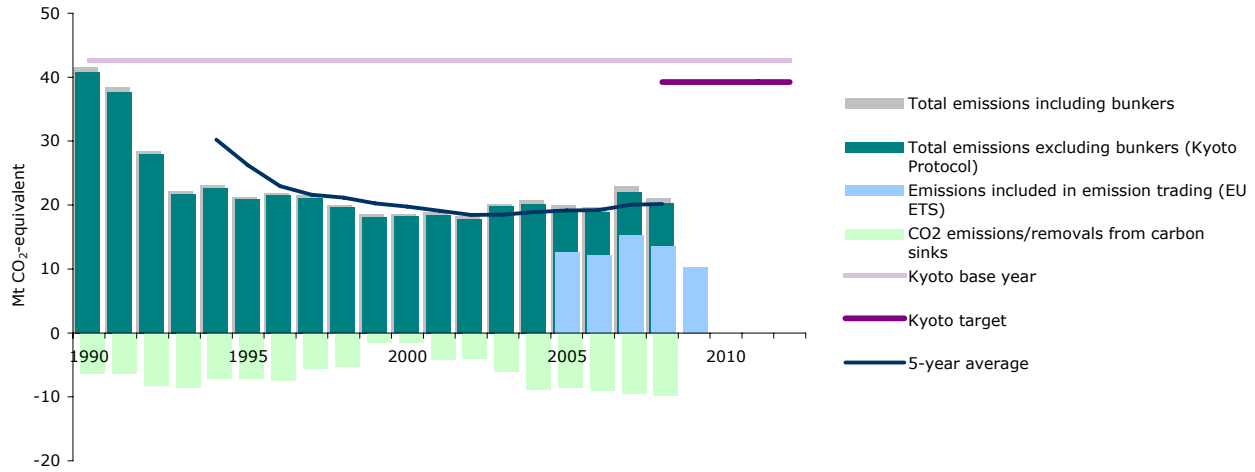
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

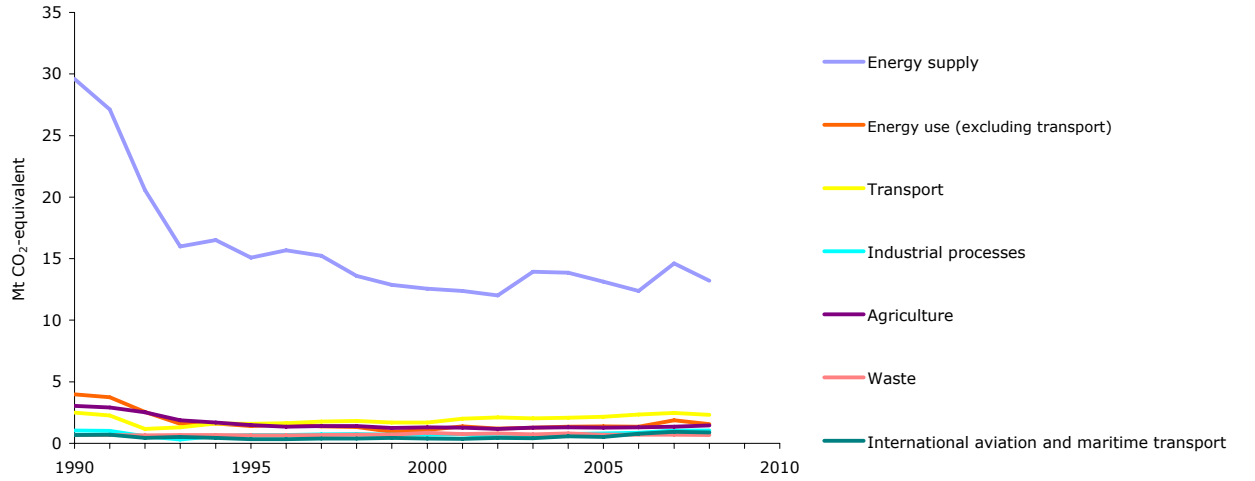
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2008 - total emissions and removals



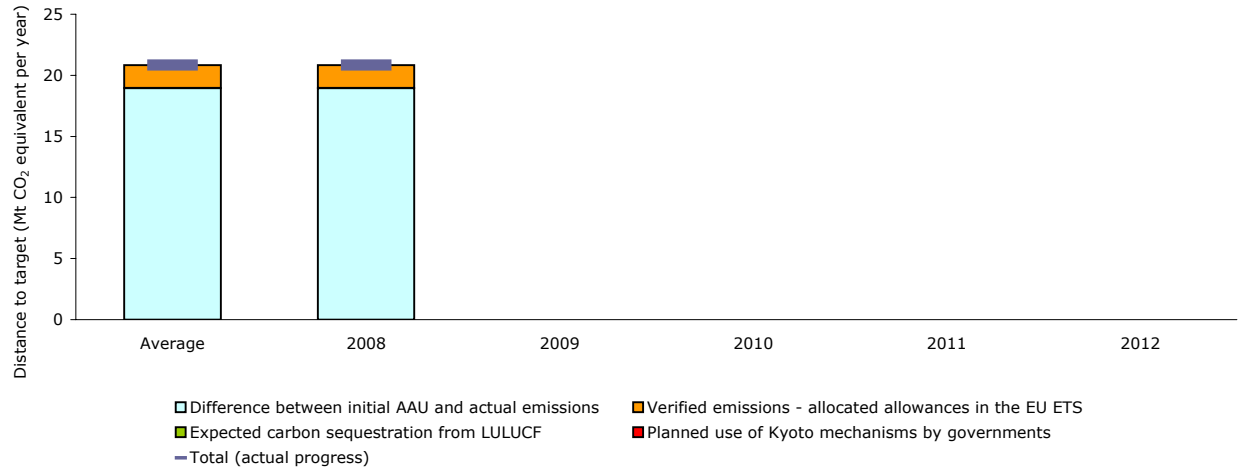
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in Estonia in 2008 were 52.5 % lower than the base-year level, well below the Kyoto target of -8 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender more allowances than were issued to the EU ETS, increasing the countries assigned amount by 4.4 % of base-year level emissions. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Estonia stand currently below their target level, by a gap representing 48.9 % of the base-year emissions.



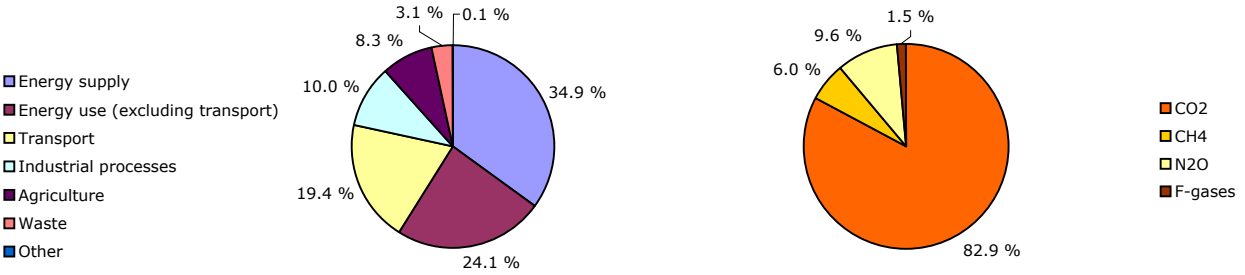
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Finland

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	70.4	78.1	70.1	n.a.	Mt CO_2-eq.	16	11
GHG from international bunkers [4]	2.9	3.2	3.1	n.a.	Mt CO_2-eq.	12	12
GHG per capita	14.1	14.8	13.2	n.a.	t CO_2-eq. / capita	5	3
GHG per GDP [5]	653	474	421	n.a.	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	1.3 %	1.5 %	1.4 %	n.a.	%		
EU ETS verified emissions [6]		42.5	36.2	34.3	Mt CO_2-eq.	13	9
Share of EU ETS verified emissions in total GHG		54.5 %	51.6 %	n.a.	%		
ETS verified emissions compared to annual allowances [7]		– 4.7 %	– 1.0 %	– 7.5 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 0.2	– 0.3 %	– 7.9	– 10.2 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
GHG per capita	– 0.9	– 6.4 %	– 1.6	– 10.6 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
EU ETS verified emissions - all installations			– 6.4	– 15.0 %			– 1.9	– 5.2 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 1.9	– 5.3 %

Assessment of long-term GHG trend (1990–2008)

The fluctuations of total emissions are mostly due to the important variations in levels of energy-related CO2 emissions, mainly according to the economic trend, the energy supply structure and climate conditions. Emissions from industrial processes have been increasing, in line with economic development. Emissions from the agriculture and waste sectors have decreased since 1990, mainly due to changes in waste legislation, implementation of the Landfill Directive (1999/31/EC), and changes in agricultural policy and farming subsidies.

Assessment of short-term GHG trend (2007–2008)

Finland realised the highest relative reduction in emissions of the EU in 2008. This was mainly the result of reduced coal and peat use and extended use of woodier biomass and hydropower for heat and electricity generation. Transport emissions decreased for the first time since 2000.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

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[2] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

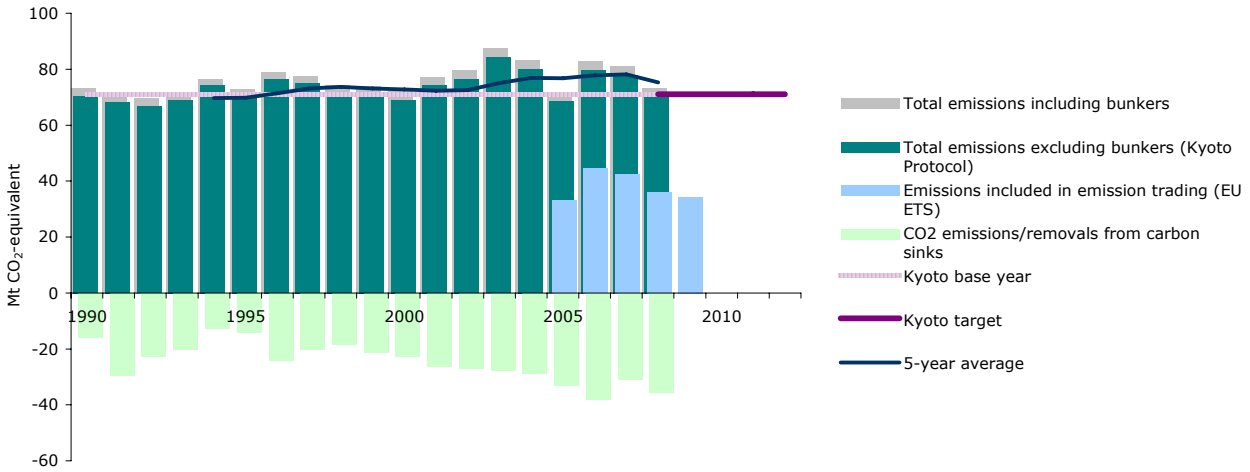
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

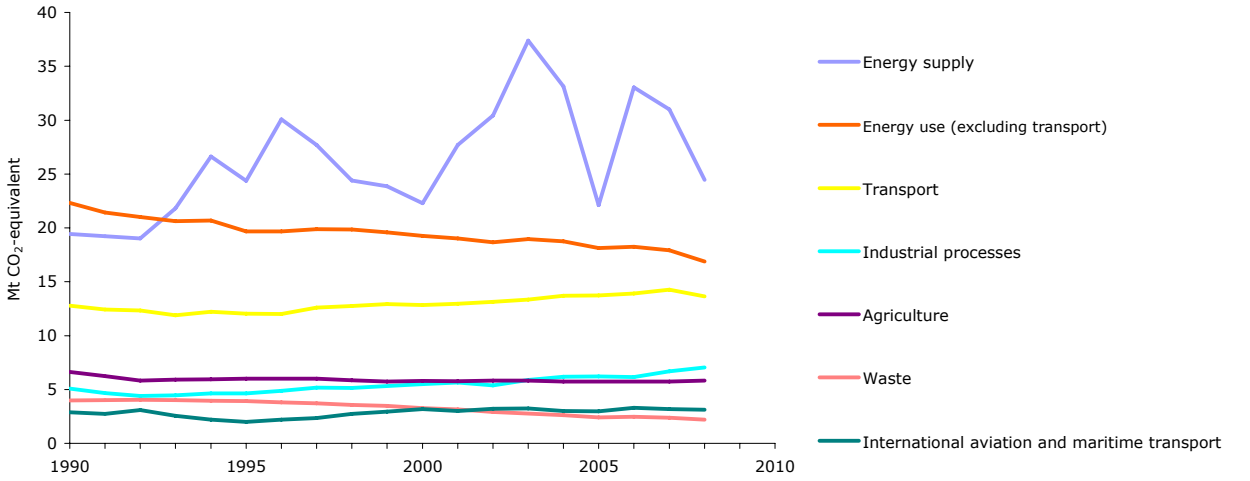
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2008 - total emissions and removals



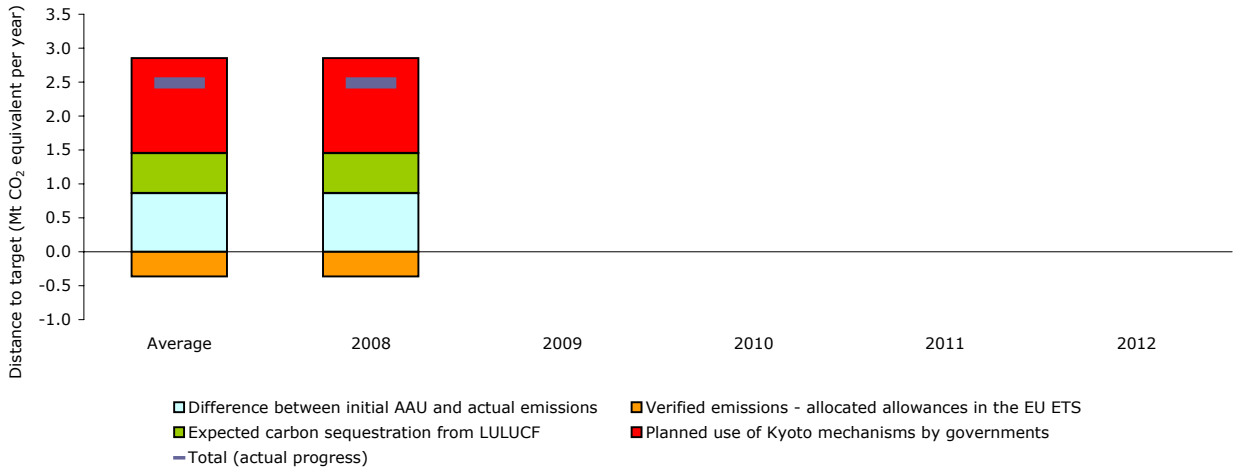
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in Finland in 2008 were 1.2 % lower than the base-year level, below the burden-sharing target of 0 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender less allowances than were issued to the EU ETS, decreasing the countries assigned amount by 0.5 % of base-year level emissions. LULUCF activities are expected to decrease net emissions by 0.8 % of base-year level emissions. Finland intends to acquire allowances corresponding to 2 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Finland stand currently below their target level, by a gap representing 3.5 % of the base-year emissions.



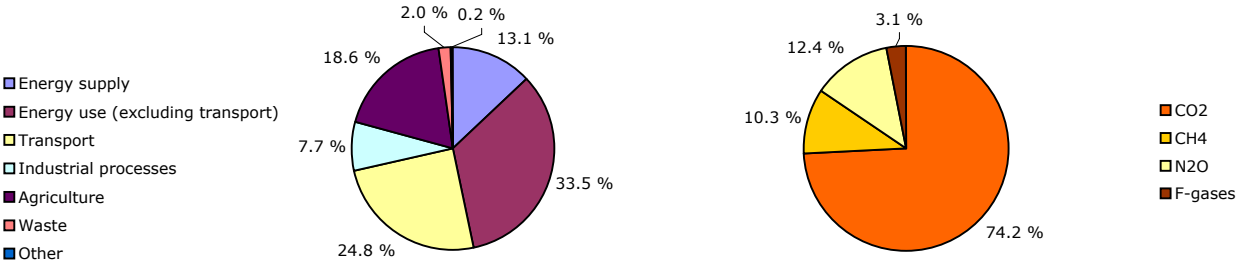
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in France

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	563.2	530.2	527.0	n.a.	Mt CO_2-eq.	4	4
GHG from international bunkers [4]	16.7	26.7	25.6	n.a.	Mt CO_2-eq.	6	6
GHG per capita	9.7	8.3	8.2	n.a.	t CO_2-eq. / capita	20	13
GHG per GDP [5]	475	324	321	n.a.	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	10.1 %	10.5 %	10.7 %	n.a.	%		
EU ETS verified emissions [6]		126.6	124.1	111.1	Mt CO_2-eq.	6	5
Share of EU ETS verified emissions in total GHG		23.9 %	23.5 %	n.a.	%		
ETS verified emissions compared to annual allowances [7]		– 15.5 %	– 7.6 %	– 16.7 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 36.2	– 6.4 %	– 3.2	– 0.6 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
GHG per capita	– 1.5	– 15.1 %	– 0.1	– 1.2 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
EU ETS verified emissions - all installations			– 2.6	– 2.0 %			– 13.0	– 10.5 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 13.8	– 11.1 %

Assessment of long-term GHG trend (1990–2008)

Emissions remained relatively stable in the 1990s and have been slightly decreasing since 1998. The large increases observed in emissions from road transport and halocarbons consumption (refrigeration and air conditioning) were offset by, among others, reduction measures in adipic acid production. Key emission trends include a steady increase in emissions from road transport since 1990 (although these emissions have now been decreasing since 2004), a considerable reduction in N2O emissions in the chemical industry 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 (2007–2008)

The largest decrease occurred in emissions from road transport, followed by emissions from public electricity and heat production (considerable decline of coal use in thermal power stations) and emissions from iron and steel production. The 2008 winter, colder than in 2007, was mainly responsible for an increase in emissions from households and services.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

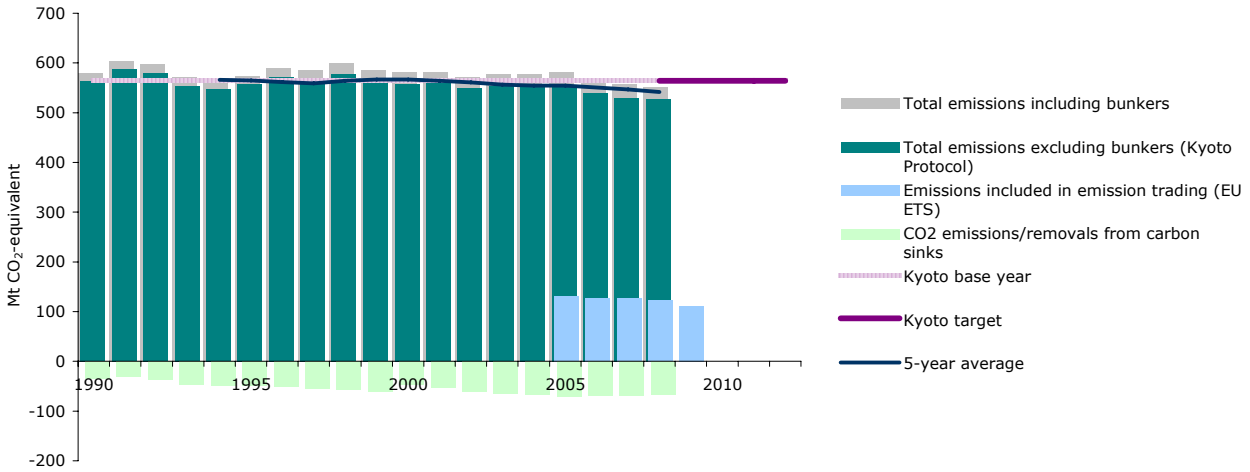
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

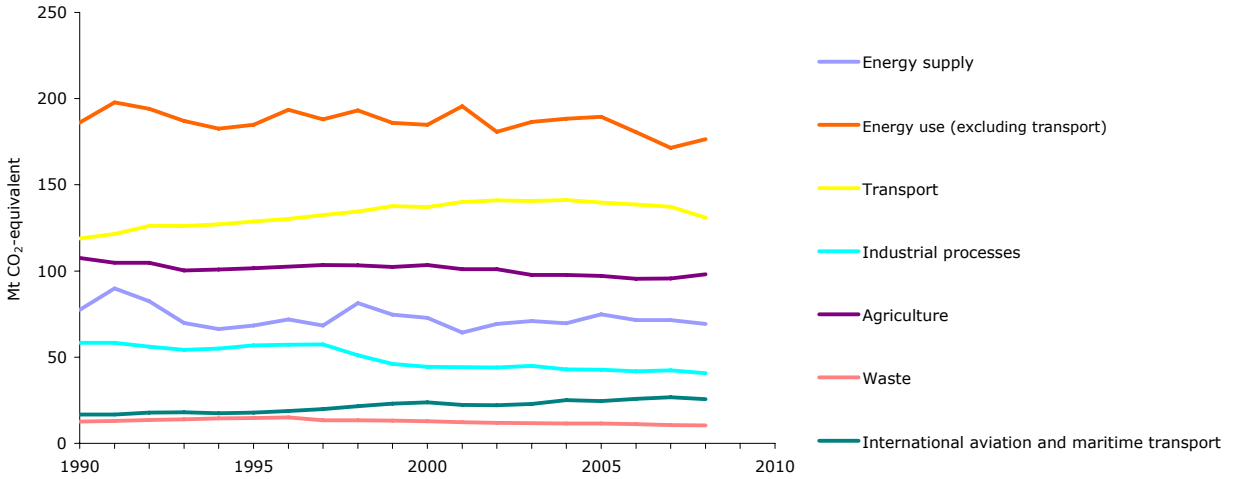
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2008 - total emissions and removals



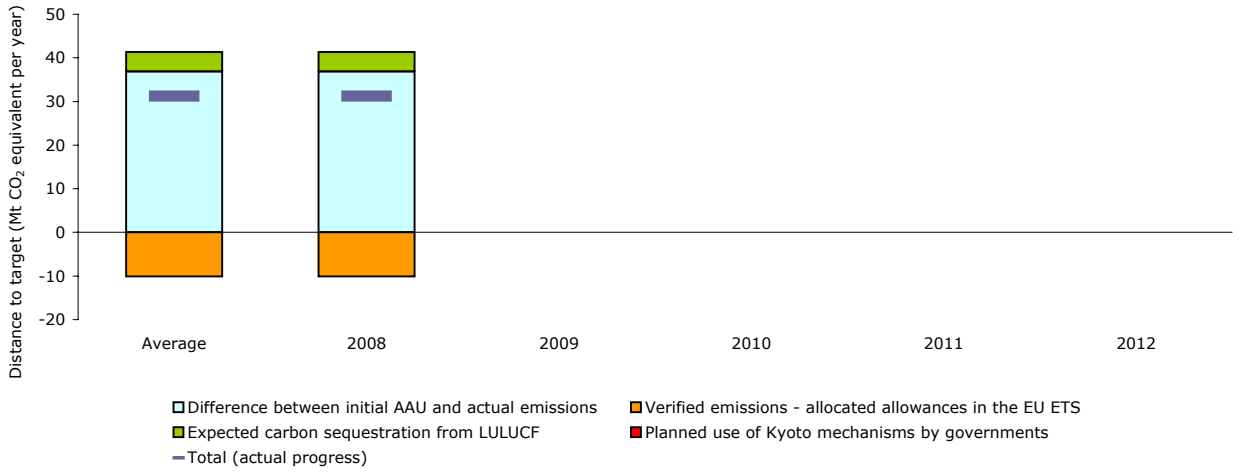
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in France in 2008 were 6.5 % lower than the base-year level, well below the burden-sharing target of 0 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender less allowances than were issued to the EU ETS, decreasing the countries assigned amount by 1.8 % of base-year level emissions. LULUCF activities are expected to decrease net emissions by 0.8 % of base-year level emissions. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in France stand currently below their target level, by a gap representing 5.5 % of the base-year emissions.



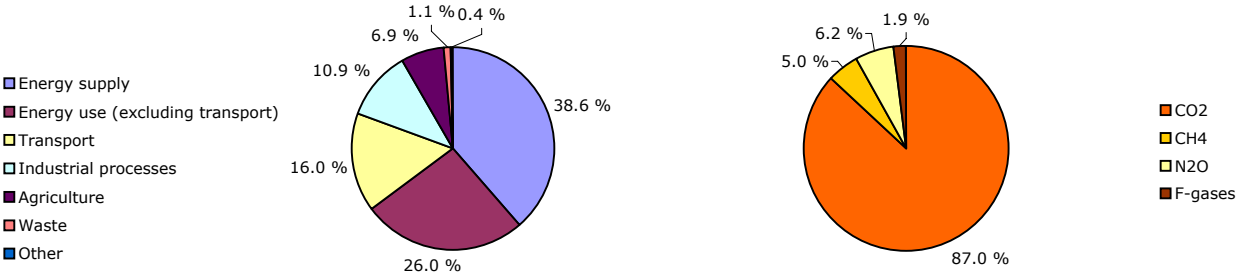
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Germany

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	1 231.8	957.3	958.1	878.3	Mt CO_2-eq.	1	1
GHG from international bunkers [4]	19.6	35.5	35.5	n.a.	Mt CO_2-eq.	4	4
GHG per capita	15.6	11.6	11.7	10.7	t CO_2-eq. / capita	10	7
GHG per GDP [5]	735	426	421	406	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	22.1 %	19.0 %	19.4 %	19.1 %	%		
EU ETS verified emissions [6]		487.1	472.7	428.2	Mt CO_2-eq.	1	1
Share of EU ETS verified emissions in total GHG		50.9 %	49.3 %	48.8 %	%		
ETS verified emissions compared to annual allowances [7]		– 2.0 %	7.9 %	– 1.2 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 273.7	– 22.2 %	0.7	0.1 %	– 353.5	– 28.7 %	– 79.8	– 8.3 %
GHG per capita	– 3.9	– 25.2 %	0.0	0.2 %	– 4.9	– 31.2 %	– 0.9	– 8.3 %
EU ETS verified emissions - all installations			– 14.5	– 3.0 %			– 44.5	– 9.4 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 39.3	– 8.4 %

Assessment of long-term GHG trend (1990–2008)

Total emissions have been steadily decreasing since 1990. Energy-related emissions decreased by nearly 22 %, which is due to fuel switching, increased energy and technical efficiency and the increased use of emission-free energy sources. Remarkably, emissions from road transport have been decreasing since 1999. Emissions from industrial processes are closely related to production intensities (e.g. production of iron and steel, chemical industry, cement industry). The decrease in agricultural emissions is mainly caused by reduced livestock, fewer emissions from agricultural soils and less fertiliser use. The waste sector shows the highest reduction due to increased recycling and the off for disposal of biodegradable waste.

Assessment of short-term GHG trend (2007–2008)

A number of factors (a mild winter period in 2008, further expansion of use of renewable energies and methodological changes) resulted in 2008 levels of emissions being about the same as those in 2007 and, overall, lower than those in the years prior to 2007.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

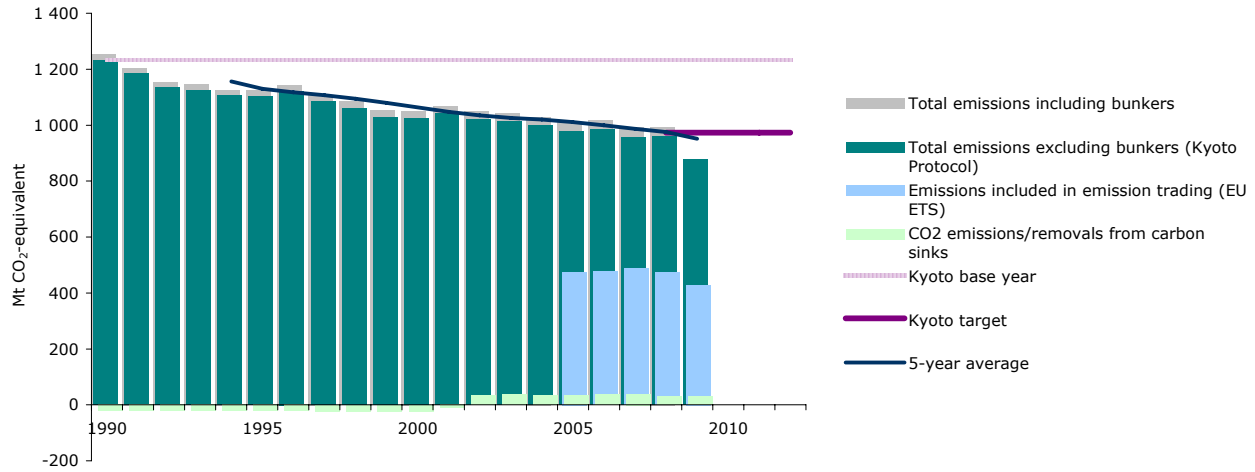
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

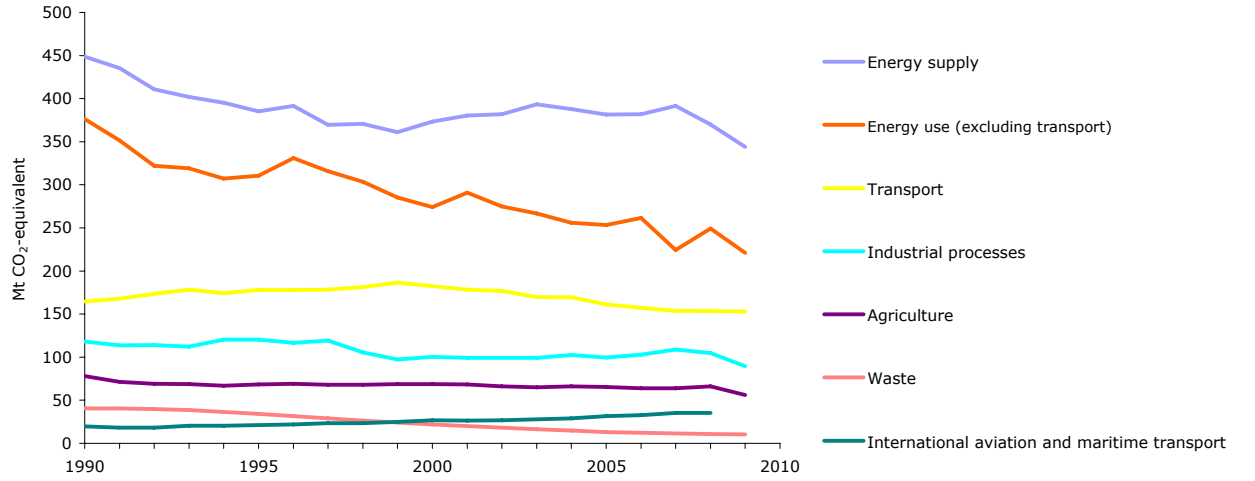
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2009 - total emissions and removals



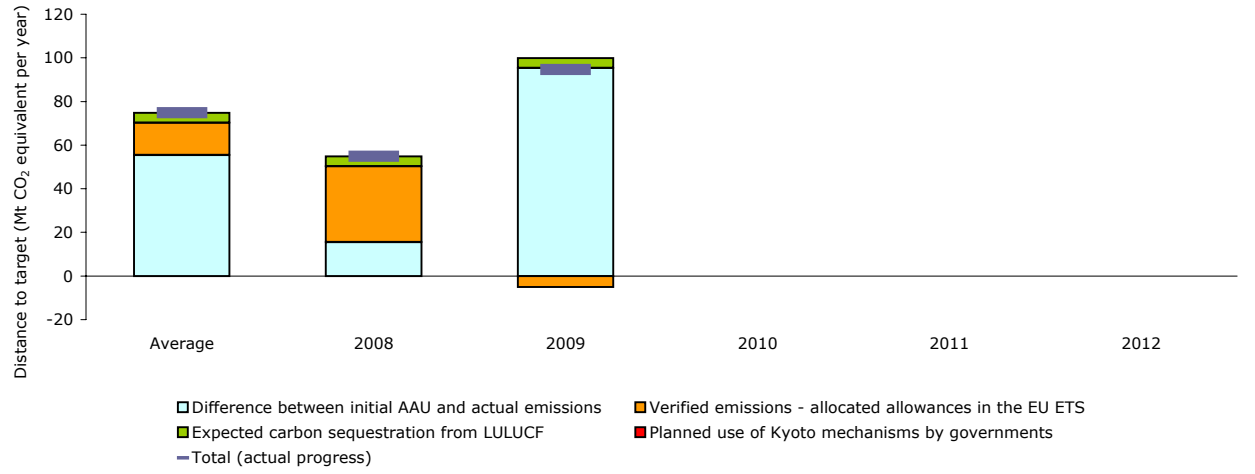
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Average emissions in Germany in 2008–2009 were 25.5 % lower than the base-year level, below the burden-sharing target of -21 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender more allowances than were issued to the EU ETS, increasing the countries assigned amount by 1.2 % of base-year level emissions. LULUCF activities are expected to decrease net emissions by 0.4 % of base-year level emissions. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Germany stand currently below their target level, by a gap representing 6.1 % of the base-year emissions.



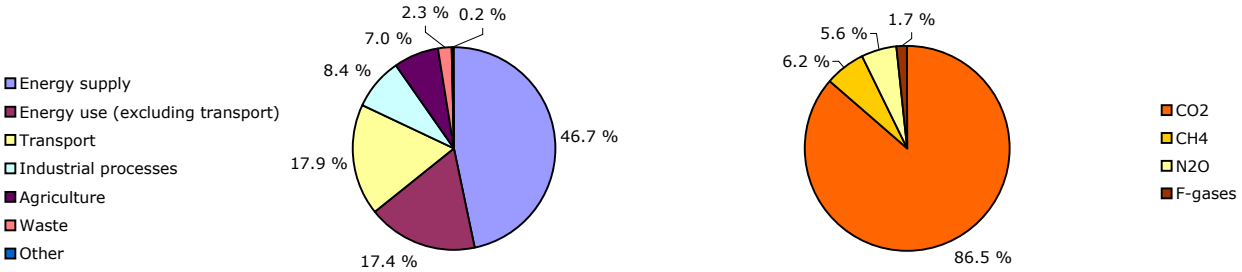
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Greece

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	103.3	131.9	126.9	n.a.	Mt CO_2-eq.	11	8
GHG from international bunkers [4]	10.6	13.1	12.5	n.a.	Mt CO_2-eq.	8	8
GHG per capita	10.2	11.8	11.3	n.a.	t CO_2-eq. / capita	11	8
GHG per GDP [5]	944	717	676	n.a.	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	1.9 %	2.6 %	2.6 %	n.a.	%		
EU ETS verified emissions [6]		72.7	69.9	63.7	Mt CO_2-eq.	9	7
Share of EU ETS verified emissions in total GHG		55.1 %	55.1 %	n.a.	%		
ETS verified emissions compared to annual allowances [7]		2.2 %	9.7 %	0.7 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	23.6	22.8 %	– 5.0	– 3.8 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
GHG per capita	1.1	10.9 %	– 0.5	– 4.1 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
EU ETS verified emissions - all installations			– 2.9	– 3.9 %			– 6.2	– 8.9 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 6.2	– 8.9 %

Assessment of long-term GHG trend (1990–2008)

The living standards improvement, due to the economic development of the period 1990–2007, the important growth of the services sector and the introduction of natural gas in the Greek energy system represent the basic factors affecting emissions trends from Energy. The substantial increase of GHG emissions from road transport is directly linked to the increase of vehicles fleet but also to the increase of transportation activity. Emissions from industrial processes in 2008 accounted for 8.4 % of the total emissions (without LULUCF) and increased by approximately 10.69 % compared to 1990 levels. Intense fluctuation is observed 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. Emissions have started levelling off since 2005.

Assessment of short-term GHG trend (2007–2008)

Emissions decreased in all major sectors, including transport. In the agriculture sector emissions decreased most (by 7 %) due to a reduction in the use of synthetic nitrogen fertilizers.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

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[2] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

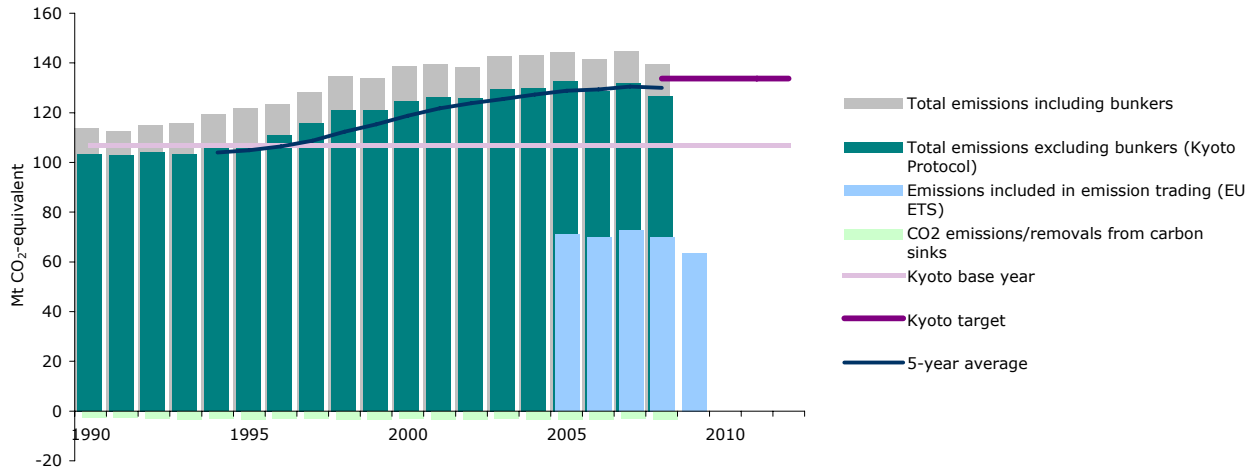
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

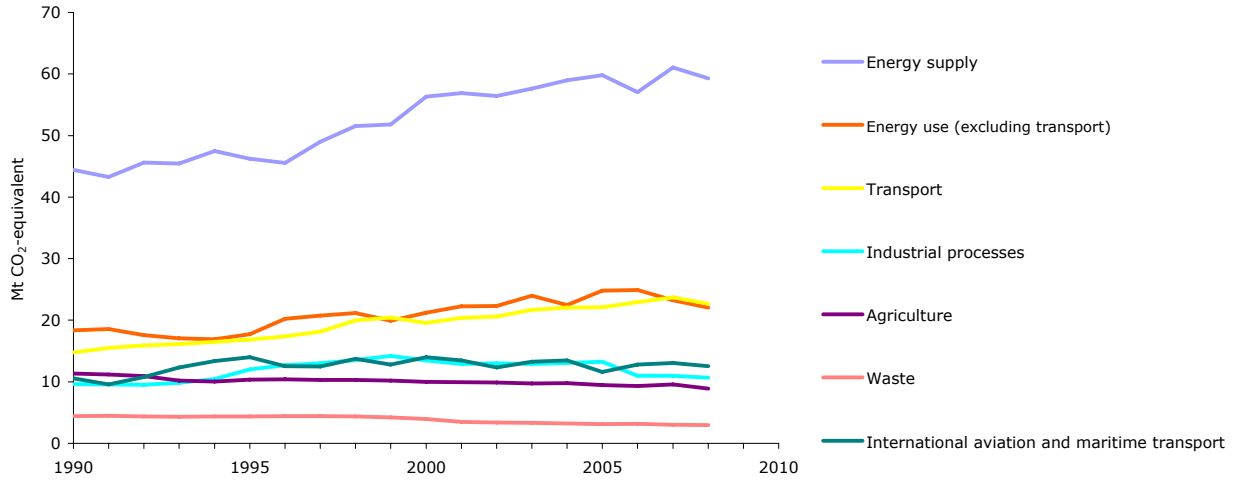
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2008 - total emissions and removals



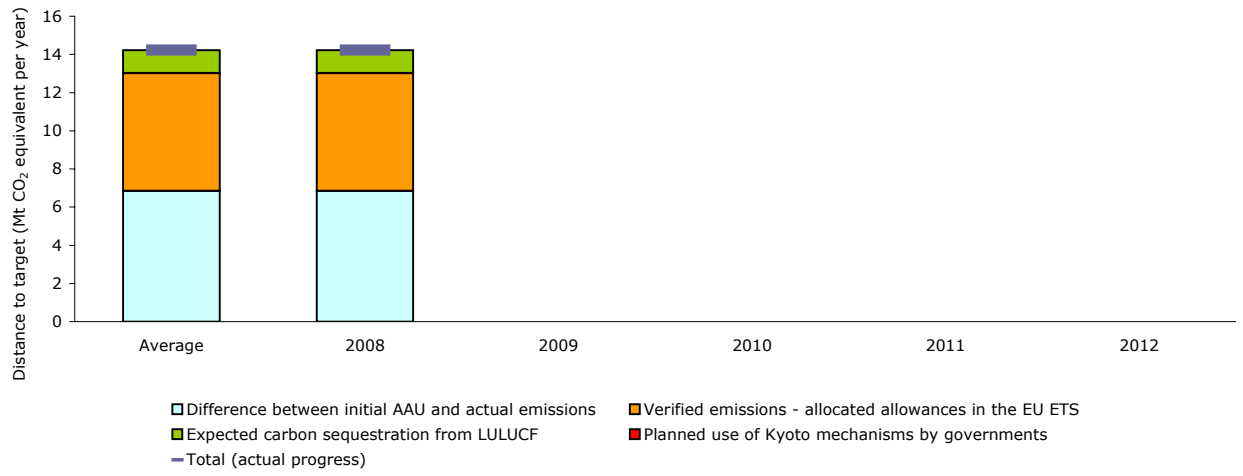
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in Greece in 2008 were 18.6 % higher than the base-year level, well below the burden-sharing target of 25 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender more allowances than were issued to the EU ETS, increasing the countries assigned amount by 5.8 % of base-year level emissions. LULUCF activities are expected to decrease net emissions by 1.1 % of base-year level emissions. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Greece stand currently below their target level, by a gap representing 13.3 % of the base-year emissions.



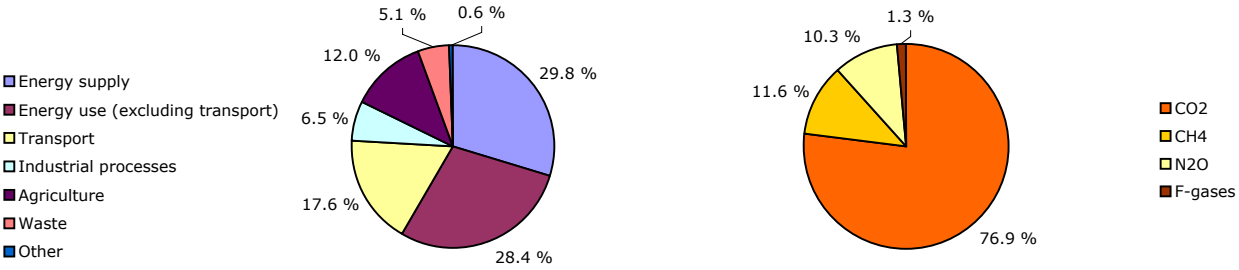
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Hungary

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	97.4	75.7	73.1	n.a.	Mt CO_2-eq.	15	n.a.
GHG from international bunkers [4]	0.5	0.8	0.8	n.a.	Mt CO_2-eq.	24	n.a.
GHG per capita	9.4	7.5	7.3	n.a.	t CO_2-eq. / capita	22	n.a.
GHG per GDP [5]	n.a.	1 142	1 096	n.a.	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	1.7 %	1.5 %	1.5 %	n.a.	%		
EU ETS verified emissions [6]		26.8	27.2	22.4	Mt CO_2-eq.	16	n.a.
Share of EU ETS verified emissions in total GHG		35.4 %	37.2 %	n.a.	%		
ETS verified emissions compared to annual allowances [7]		– 11.2 %	8.8 %	– 6.3 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 24.2	– 24.9 %	– 2.6	– 3.4 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
GHG per capita	– 2.1	– 22.4 %	– 0.2	– 3.2 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
EU ETS verified emissions - all installations			0.4	1.5 %			– 4.8	– 17.8 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 4.8	– 17.6 %

Assessment of long-term GHG trend (1990–2008)

Large emission reductions occurred especially 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 have been steadily increasing since 1994. Total emissions from agriculture decreased over the period 1985-2007. The bulk of this decrease occurred between 1985 and 1995, when agricultural production underwent a drastic decrease. Emissions reductions were also observed in industrial processes, in particular for mineral products and the chemical industry. The growth in emissions from waste has shown signs of stabilisation in recent years.

Assessment of short-term GHG trend (2007–2008)

Emissions decreased in all major sectors. The highest relative reduction (-20.6 %) occurred in the industrial processes sector, mainly due to lower production volumes and modernization in chemical industry (-62.6 %). The chemical industry was responsible for about 1.2 to 1.4 of the 2.5 million tonnes CO2-equivalent reduction. A further decrease of 0.9 million tonnes was mainly due to reduced use of fossil fuels by the energy industries.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

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[3] Comparison of 2008 values, 1 = highest value among EU countries.

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

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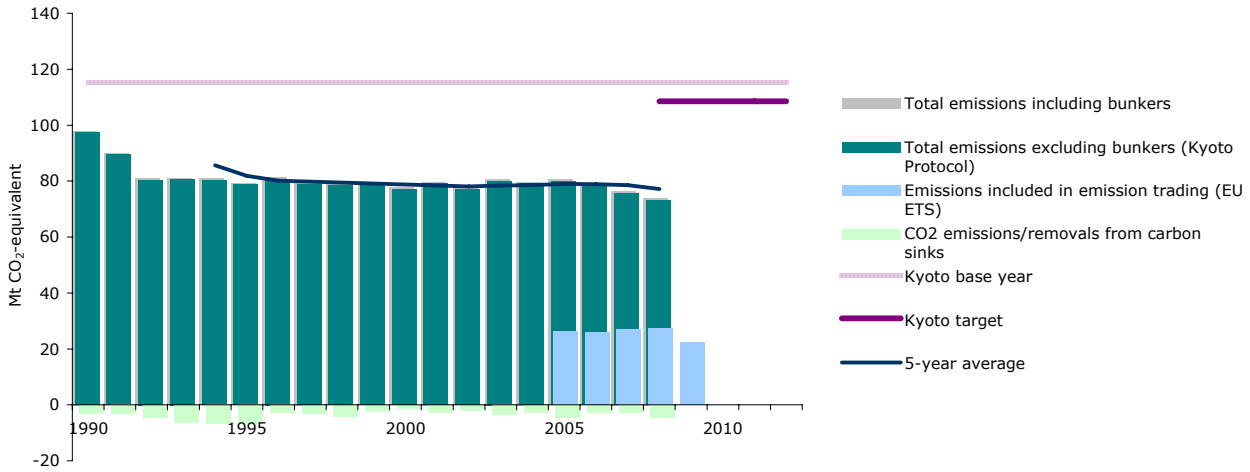
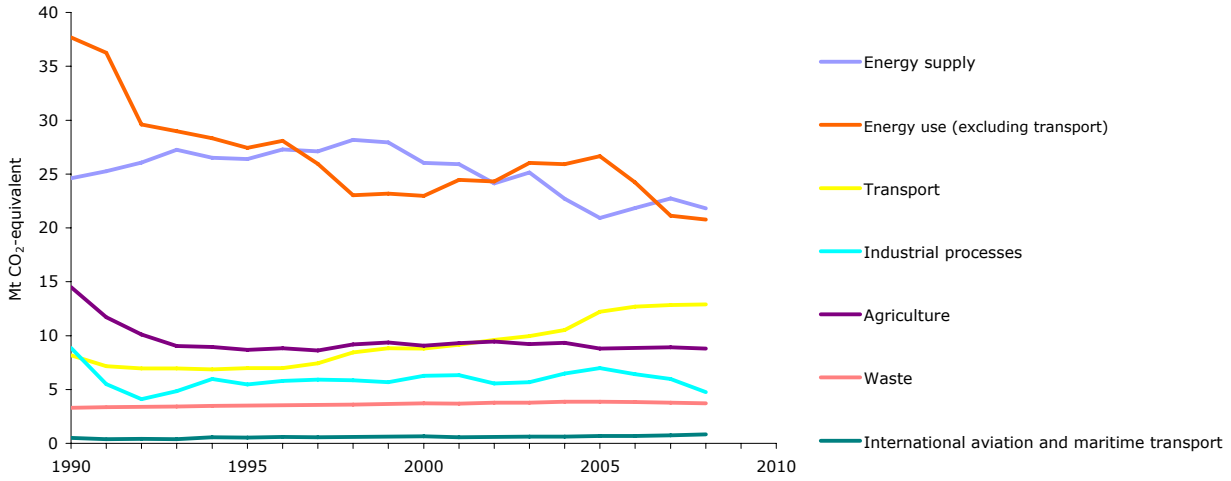
[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2008 - total emissions and removals



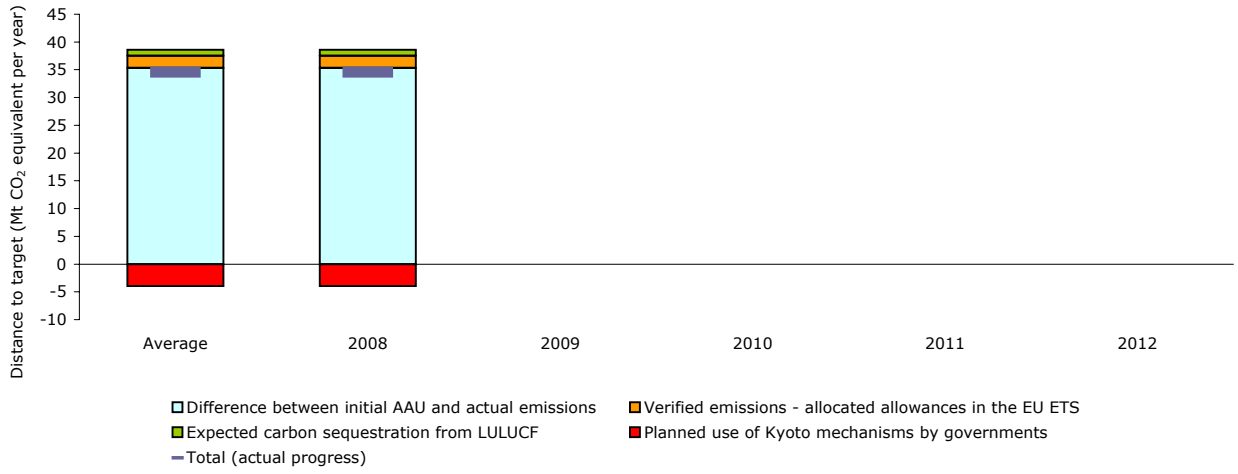
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in Hungary in 2008 were 36.6 % lower than the base-year level, well below the Kyoto target of -6 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender more allowances than were issued to the EU ETS, increasing the countries assigned amount by 1.9 % of base-year level emissions. LULUCF activities are expected to decrease net emissions by 0.9 % of base-year level emissions. Hungary intends to sell allowances corresponding to 3.5 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Hungary stand currently below their target level, by a gap representing 30 % of the base-year emissions.



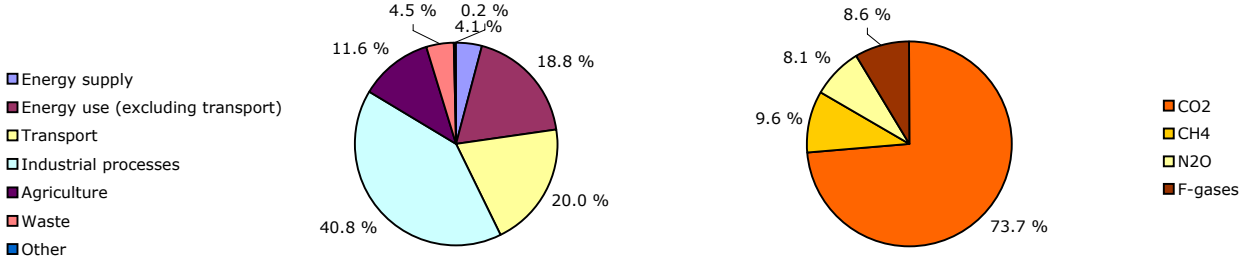
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Iceland

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	3.4	4.5	4.9	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG from international bunkers [4]	0.3	0.7	0.7	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG per capita	13.5	14.7	15.5	n.a.	t CO_2-eq. / capita	n.a.	n.a.
GHG per GDP [5]	466	350	375	n.a.	g CO_2-eq. / euro		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	1.5	42.9 %	0.4	8.3 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
GHG per capita	2.0	15.0 %	0.8	5.6 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*

Assessment of long-term GHG trend (1990–2008)

Around 80 % of Iceland's energy – and almost all stationary energy – comes 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. While they were relatively stable over the period 1999–2005 (at the level of the Kyoto target), emissions have dramatically increased in the last three consecutive years. This recent upward trend is almost exclusively driven by the expansion of heavy industry in Iceland, mainly in the field of aluminium production. This industry produces exclusively for export. Current production capacity of the plant is 260 000 tonnes per year. The latest large scale project was the Alcoa aluminium plant, which started production in 2007 and has a production capacity of 350 000 tonnes of aluminium per year. 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 sequestering of carbon from the atmosphere.

Assessment of short-term GHG trend (2007–2008)

The significant increase in total emissions was almost exclusively due to increased emissions from aluminium production. In relative terms, emissions from public electricity and heat also contributed significantly towards the overall increase.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

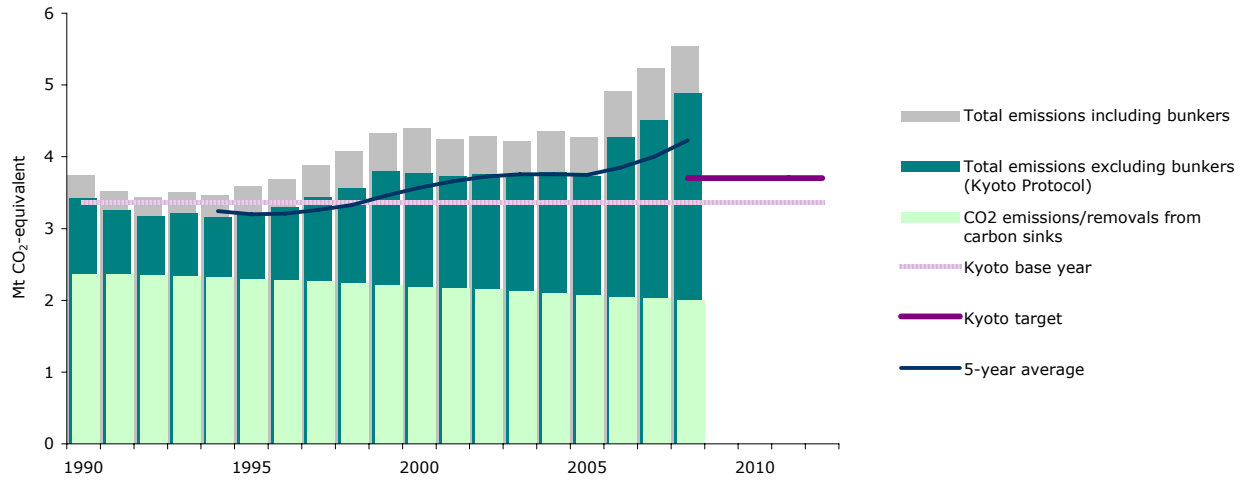
[3] Comparison of 2008 values, 1 = highest value among EU countries.

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

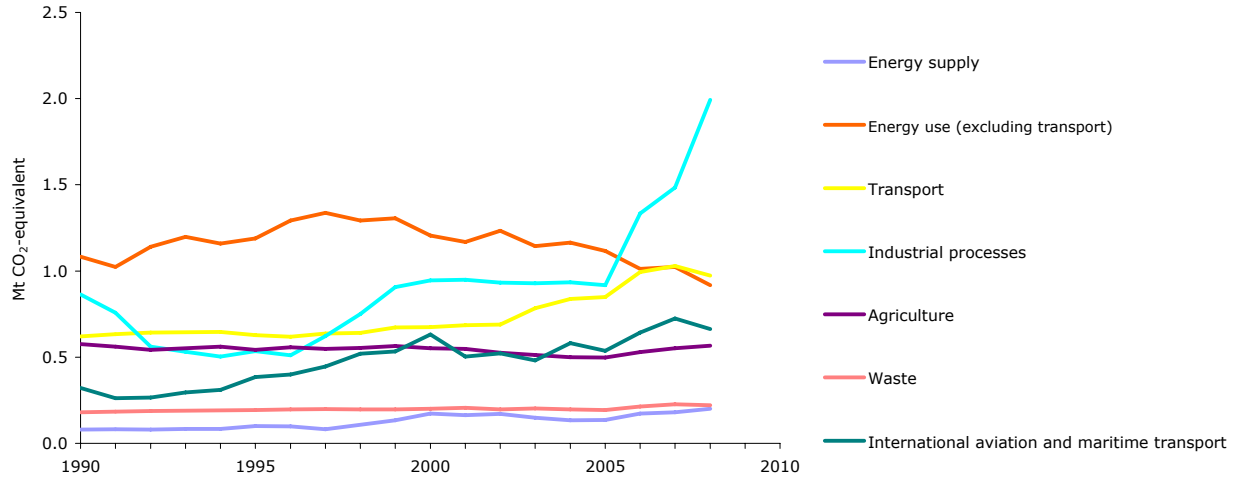
[5] GDP in constant 2000 prices - not suitable for a quantitative comparison between countries for the same year.

[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

GHG trends 1990–2008 - total emissions and removals



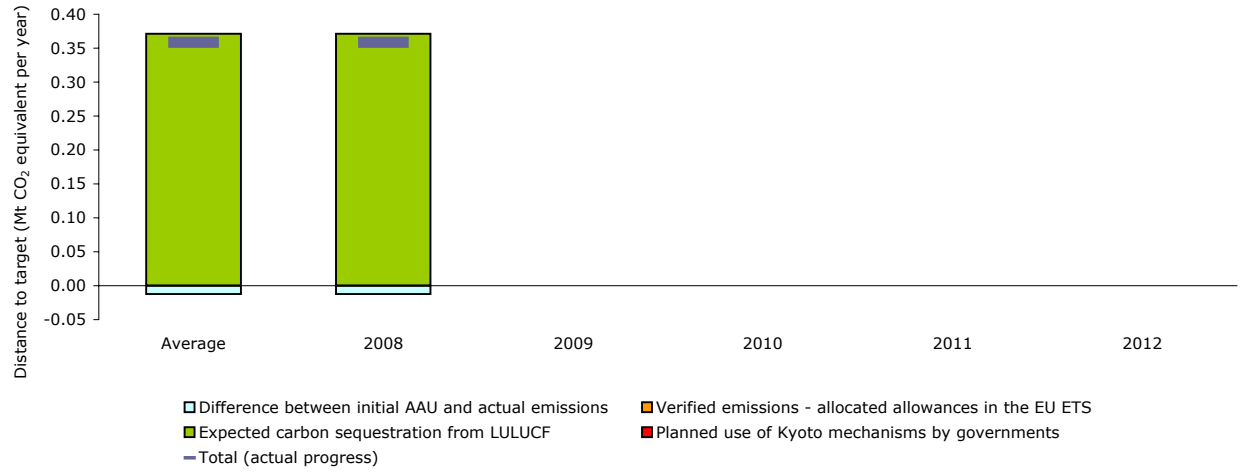
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in Iceland in 2008 were 10.4 % higher than the base-year level, above the Kyoto target of 10 % for the period 2008–2012. LULUCF activities are expected to decrease net emissions by 11 % of base-year level emissions. Taking all these effects in to account, emissions in Iceland stand currently below their target level, by a gap representing 10.6 % of the base-year emissions.



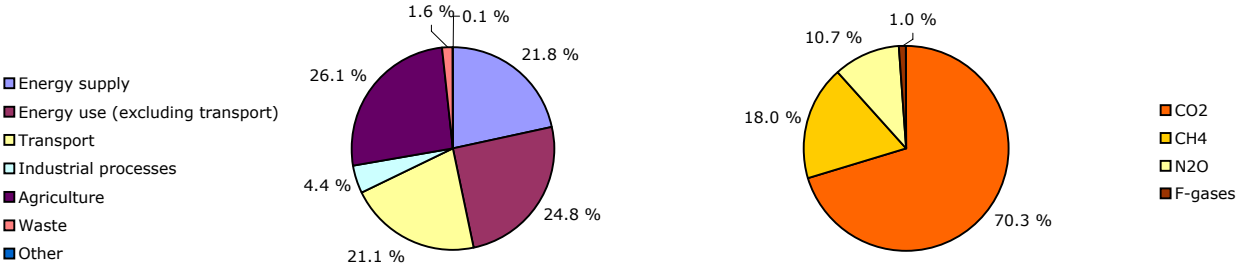
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Ireland

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	54.8	67.6	67.4	n.a.	Mt CO_2-eq.	17	12
GHG from international bunkers [4]	1.1	3.4	3.0	n.a.	Mt CO_2-eq.	13	13
GHG per capita	15.6	15.7	15.3	n.a.	t CO_2-eq. / capita	2	2
GHG per GDP [5]	1 039	443	455	n.a.	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	1.0 %	1.3 %	1.4 %	n.a.	%		
EU ETS verified emissions [6]		21.2	20.4	17.2	Mt CO_2-eq.	19	13
Share of EU ETS verified emissions in total GHG		31.4 %	30.2 %	n.a.	%		
ETS verified emissions compared to annual allowances [7]		10.4 %	2.1 %	– 14.6 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	12.6	23.0 %	– 0.2	– 0.3 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
GHG per capita	– 0.3	– 2.0 %	– 0.4	– 2.3 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
EU ETS verified emissions - all installations			– 0.9	– 4.1 %			– 3.2	– 15.5 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 3.2	– 15.7 %

Assessment of long-term GHG trend (1990–2008)

The large increase in emissions during the period 1990-2001 was clearly driven by the growth in CO2 emissions from energy use. Between 1994 and 2001, during which Ireland experienced a period of unprecedented economic growth, and energy emissions grew by an average of 4.3 percent 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 2008 is largely due to decreases in the agriculture and waste sectors and in 2008 to reduced emissions from mineral products in the industrial processes sector. The increase in transport emissions came to an end in 2008. Between 1990 and 2007, the transport sector shows the greatest increase at 178 percent, which can be attributed to increasing vehicle numbers and larger vehicles, consequent to economic and demographic growths.

Assessment of short-term GHG trend (2007–2008)

The effects of the economic downturn are mainly evident in the 4 % reduction in emissions from the industry and commercial sector with smaller decreases (<1 %) from the agriculture and transport sectors. Energy sector emissions are largely unchanged. However an increase in emissions from the residential sector (reflecting colder winter months) cancels the benefit of these reductions to a large extent. For the first time since 1993, road transport emissions were stabilised.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

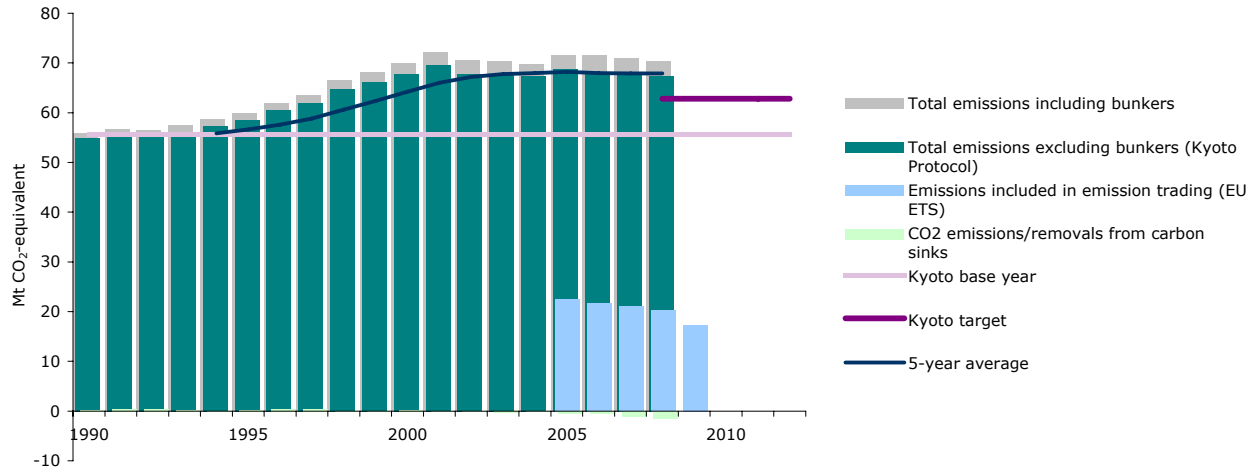
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

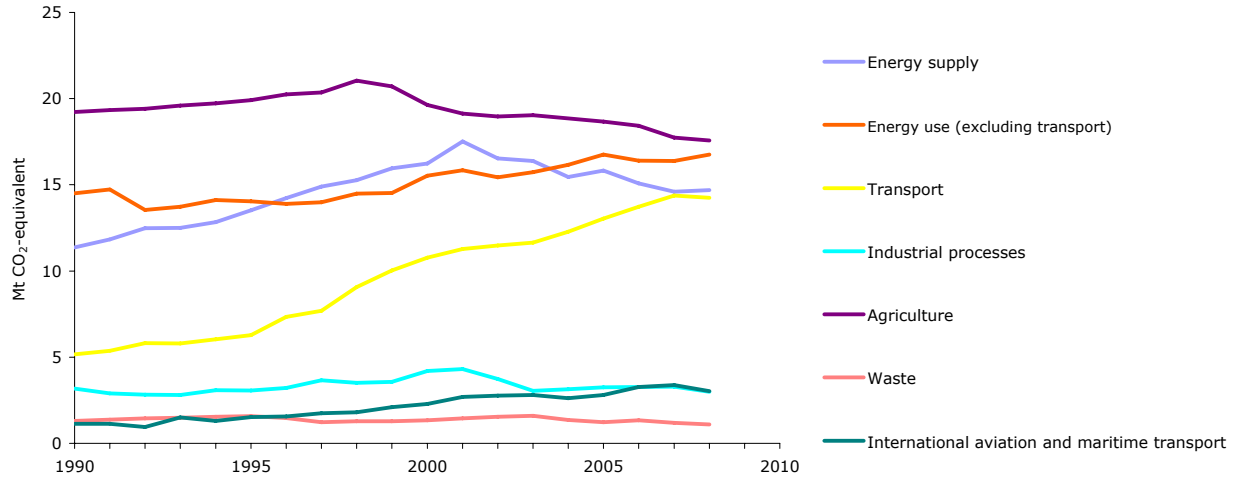
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2008 - total emissions and removals



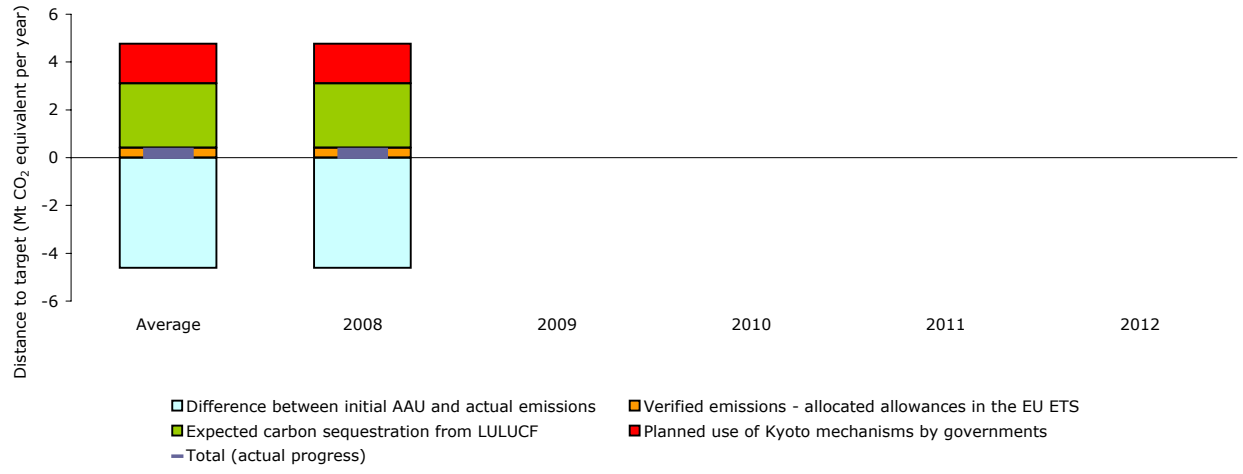
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in Ireland in 2008 were 21.3 % higher than the base-year level, significantly above the burden-sharing target of 13 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender more allowances than were issued to the EU ETS, increasing the countries assigned amount by 0.7 % of base-year level emissions. LULUCF activities are expected to decrease net emissions by 4.9 % of base-year level emissions. Ireland intends to acquire allowances corresponding to 3 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Ireland stand currently below their target level, by a gap representing 0.3 % of the base-year emissions.



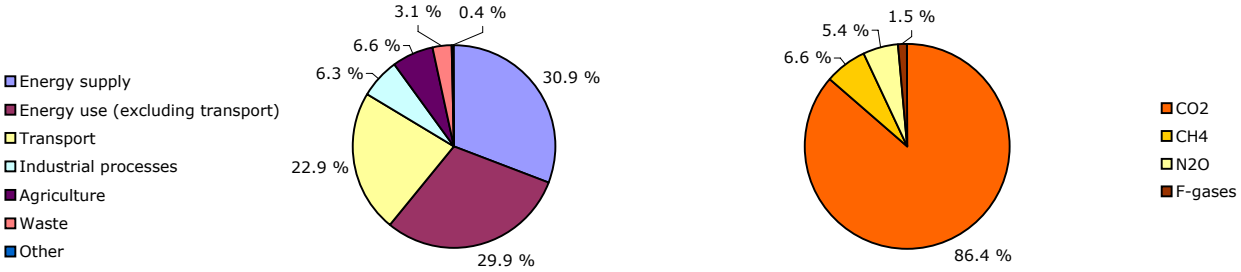
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Italy

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	517.0	552.6	541.5	495.0	Mt CO_2-eq.	3	3
GHG from international bunkers [4]	8.6	18.3	18.5	n.a.	Mt CO_2-eq.	7	7
GHG per capita	9.1	9.3	9.1	8.2	t CO_2-eq. / capita	17	11
GHG per GDP [5]	508	429	426	410	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	9.3 %	11.0 %	11.0 %	10.8 %	%		
EU ETS verified emissions [6]		226.4	220.7	184.9	Mt CO_2-eq.	3	3
Share of EU ETS verified emissions in total GHG		41.0 %	40.8 %	37.3 %	%		
ETS verified emissions compared to annual allowances [7]		11.4 %	4.2 %	– 9.4 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	24.4	4.7 %	– 11.1	– 2.0 %	– 22.0	– 4.3 %	– 46.4	– 8.6 %
GHG per capita	– 0.0	– 0.4 %	– 0.3	– 2.8 %	– 0.9	– 9.6 %	– 0.8	– 8.6 %
EU ETS verified emissions - all installations			– 5.7	– 2.5 %			– 35.8	– 16.2 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 36.1	– 16.4 %

Assessment of long-term GHG trend (1990–2008)

After a long period of increasing emissions between 1994 and 2004, emissions have been regularly decreasing since. Energy-related emissions increased by about 8.2 % from 1990 to 2008. Significant increases were observed in the transport sector, energy industries and in the households and services sectors. 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 emissions increased considerably (221 %). Emissions in the agricultural sector decreased mostly due to reduced CH4 emissions from enteric fermentation and of N2O emissions from agricultural soils. Emissions from the waste sector decreased due to reduced emissions from solid waste disposal on land.

Assessment of short-term GHG trend (2007–2008)

Emissions continued to decrease for the fourth consecutive year. In particular, reductions were observed in emissions from energy industries, iron and steel industry, and pulp and paper production, 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.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

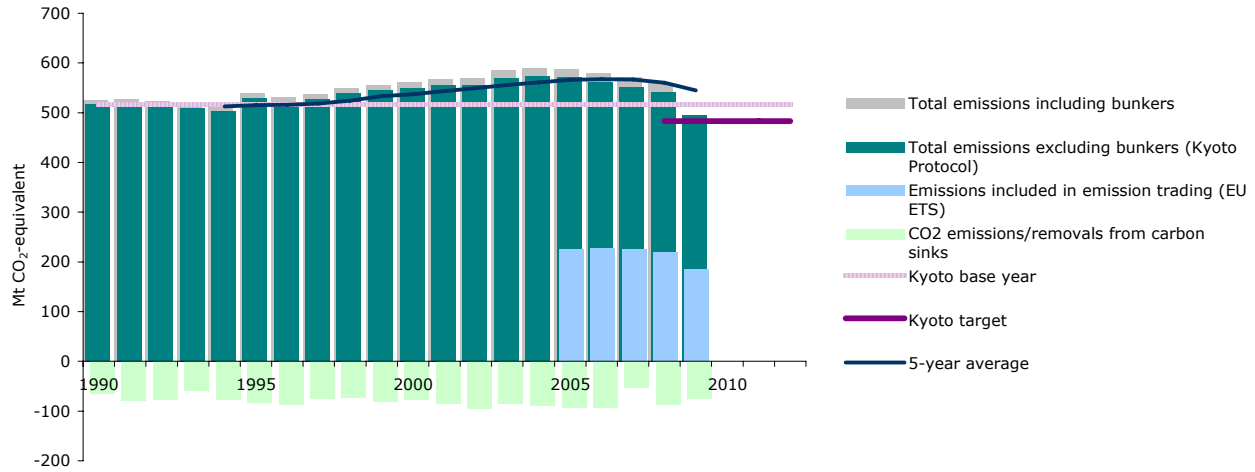
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

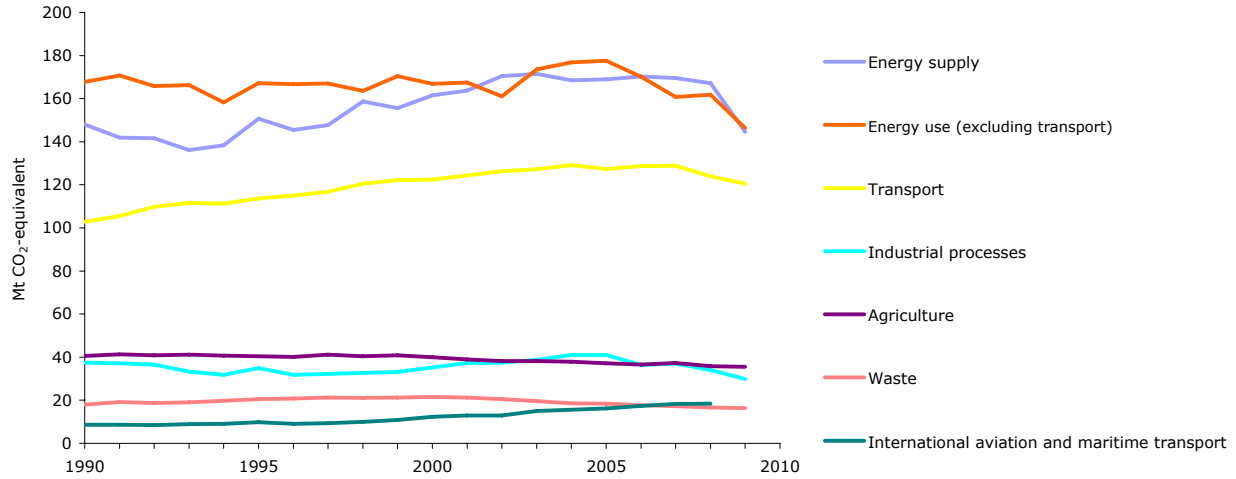
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2009 - total emissions and removals



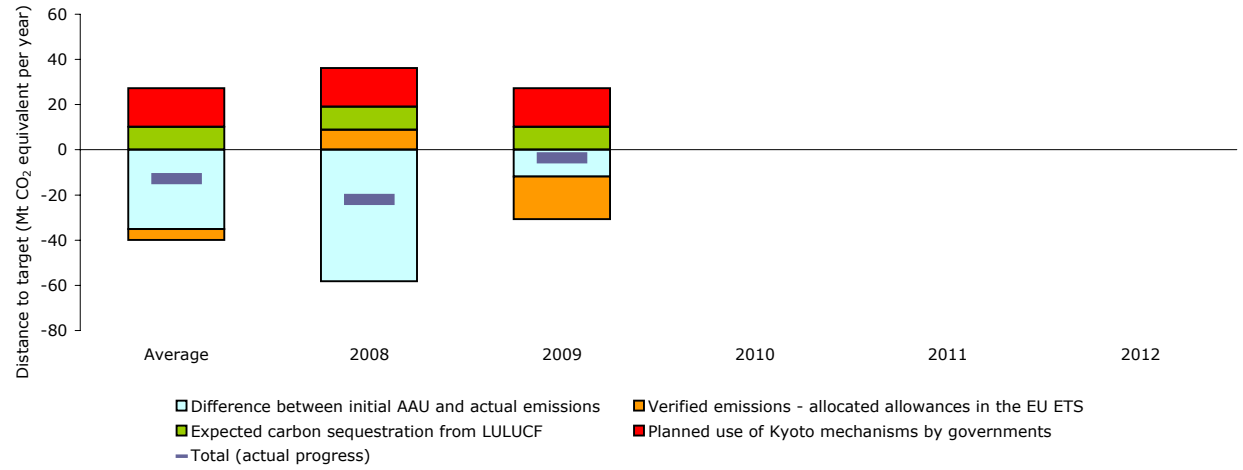
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Average emissions in Italy in 2008–2009 were 0.3 % higher than the base-year level, significantly above the burden-sharing target of -6.5 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender less allowances than were issued to the EU ETS, decreasing the countries assigned amount by 1 % of base-year level emissions. LULUCF activities are expected to decrease net emissions by 2 % of base-year level emissions. Italy intends to acquire allowances corresponding to 3.3 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Italy stand currently above their target level, by a gap representing 2.5 % of the base-year emissions.



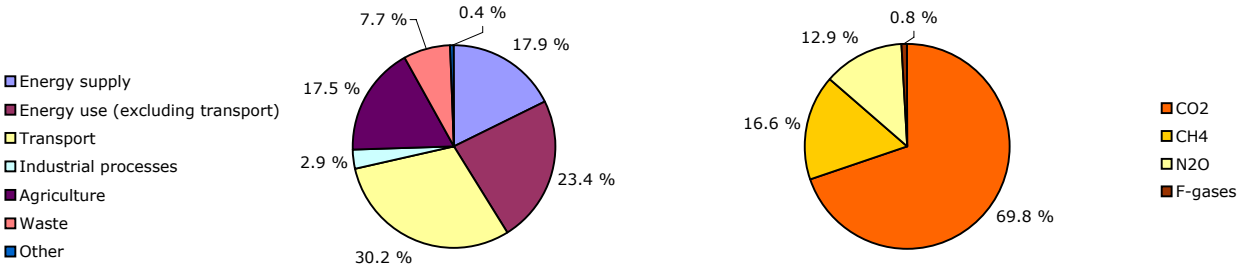
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Latvia

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	26.8	12.3	11.9	n.a.	Mt CO_2-eq.	25	n.a.
GHG from international bunkers [4]	1.8	0.8	1.0	n.a.	Mt CO_2-eq.	21	n.a.
GHG per capita	10.0	5.4	5.2	n.a.	t CO_2-eq. / capita	27	n.a.
GHG per GDP [5]	2 181	790	802	n.a.	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	0.5 %	0.2 %	0.2 %	n.a.	%		
EU ETS verified emissions [6]		2.8	2.7	2.5	Mt CO_2-eq.	25	n.a.
Share of EU ETS verified emissions in total GHG		23.2 %	23.0 %	n.a.	%		
ETS verified emissions compared to annual allowances [7]		– 29.4 %	– 6.7 %	– 29.5 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 14.9	– 55.6 %	– 0.4	– 3.1 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
GHG per capita	– 4.8	– 47.8 %	– 0.1	– 2.6 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
EU ETS verified emissions - all installations			– 0.1	– 3.7 %			– 0.3	– 9.2 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 0.4	– 15.7 %

Assessment of long-term GHG trend (1990–2008)

Emissions have decreased considerably since 1990, influenced by the economic restructuring affecting the country. The transition period to market economy started after 1991. This process provoked essential changes in all sectors of the national economy and resulted in the decrease of emissions after 1990. Since 2000, emissions have been slightly increasing under the influence of increasing energy demand and road transport.

Assessment of short-term GHG trend (2007–2008)

The emission decrease was a combined result of emission decreases in all the main fuel combustion related categories, in particular from road transport (- 6 %). Only emissions from waste increased substantially and therefore offset – to some extent – emission declines from fuel combustion.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

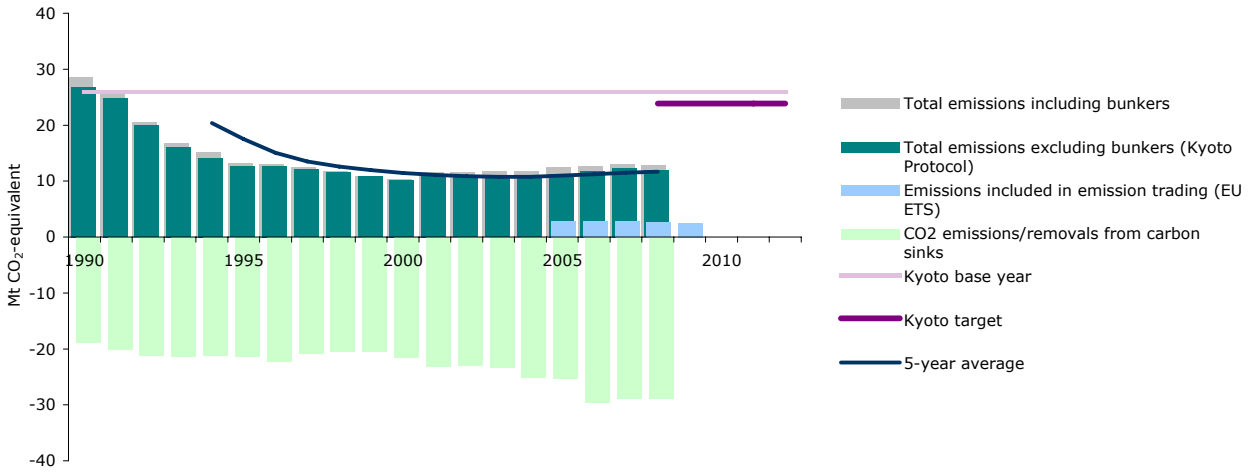
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

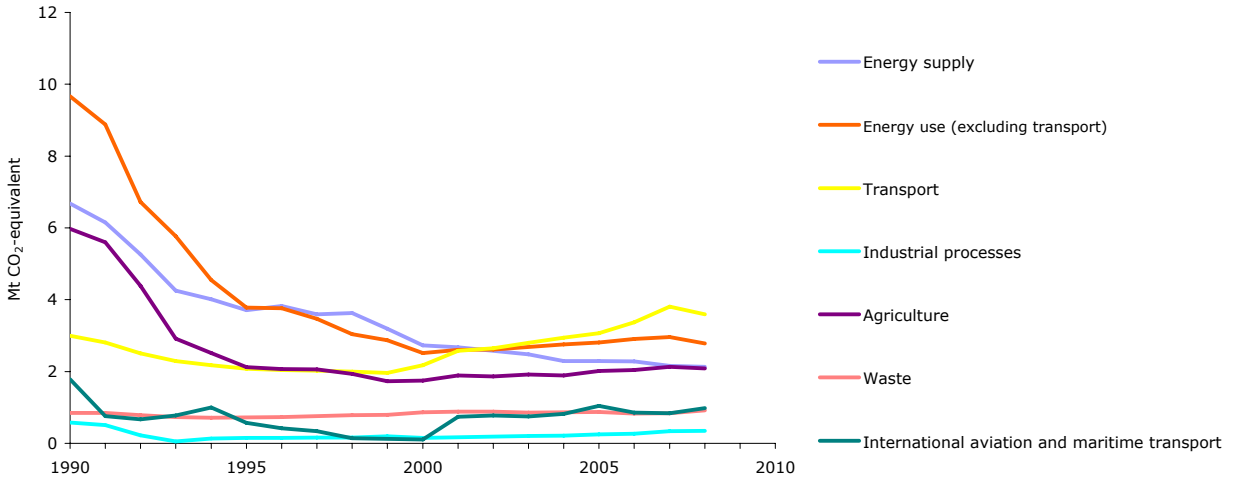
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2008 - total emissions and removals



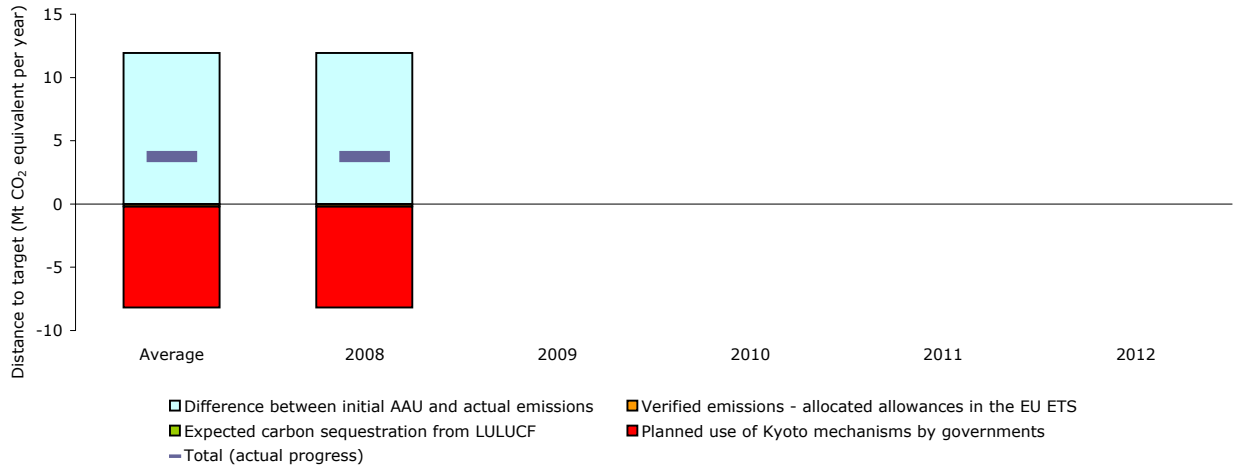
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in Latvia in 2008 were 54.1 % lower than the base-year level, well below the Kyoto target of -8 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender less allowances than were issued to the EU ETS, decreasing the countries assigned amount by 0.8 % of base-year level emissions. Latvia intends to sell allowances corresponding to 30.9 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Latvia stand currently below their target level, by a gap representing 14.4 % of the base-year emissions.



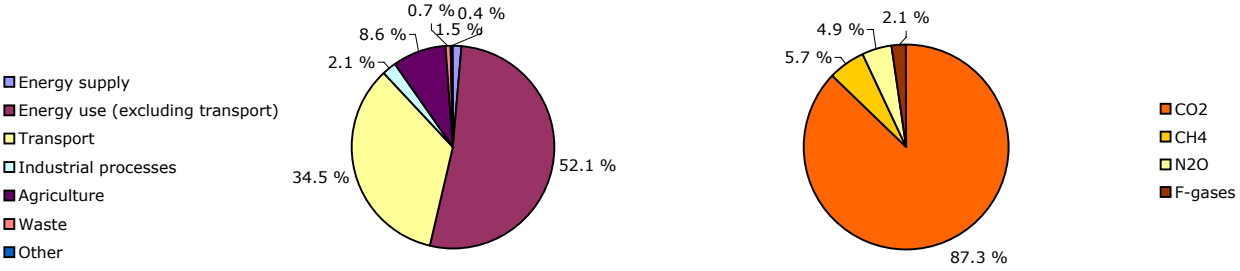
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Liechtenstein

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	0.230	0.243	0.263	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG from international bunkers [4]	0.00043	0.00077	0.00075	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG per capita	8.1	6.9	7.4	n.a.	t CO_2-eq. / capita	n.a.	n.a.
GHG per GDP [5]	n.a.	n.a.	n.a.	n.a.	g CO_2-eq. / euro		
EU ETS verified emissions [6]		n.a.	0.0199	0.0134	Mt CO_2-eq.	n.a.	n.a.
Share of EU ETS verified emissions in total GHG		n.a.	n.a.	n.a.	%		
ETS verified emissions compared to annual allowances [7]		n.a.	n.a.	– 31.4 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	0.034	14.7 %	0.020	8.2 %	n.a.	n.a.	n.a.	n.a.
GHG per capita	– 0.6	– 7.7 %	0.5	7.6 %	n.a.	n.a.	n.a.	n.a.
EU ETS verified emissions - all installations			n.a.	n.a.			– 0.0065	– 32.7 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 0.0065	– 32.7 %

Assessment of long-term GHG trend (1990–2008)

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. 2008 were comparable with the 1990 emission level. 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 (2007–2008)

Annual variations are mostly observed in energy use from households and services for heating purposes. With significantly low emission levels in 2007 due to limited fuel consumption and reduced filling of fuel tanks (warm winter and high fuel prices), emissions from energy use picked up again in 2008, although at a level lower than that observed over the period 2002-2006. The number of heating degree days increased only by 2 % between 2007 and 2008, while the consumption of heating fuels – and related emission increased by 13.5 % in 2008. 2008 emissions from agriculture 2008 were 0.8 % above their 1990 level.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

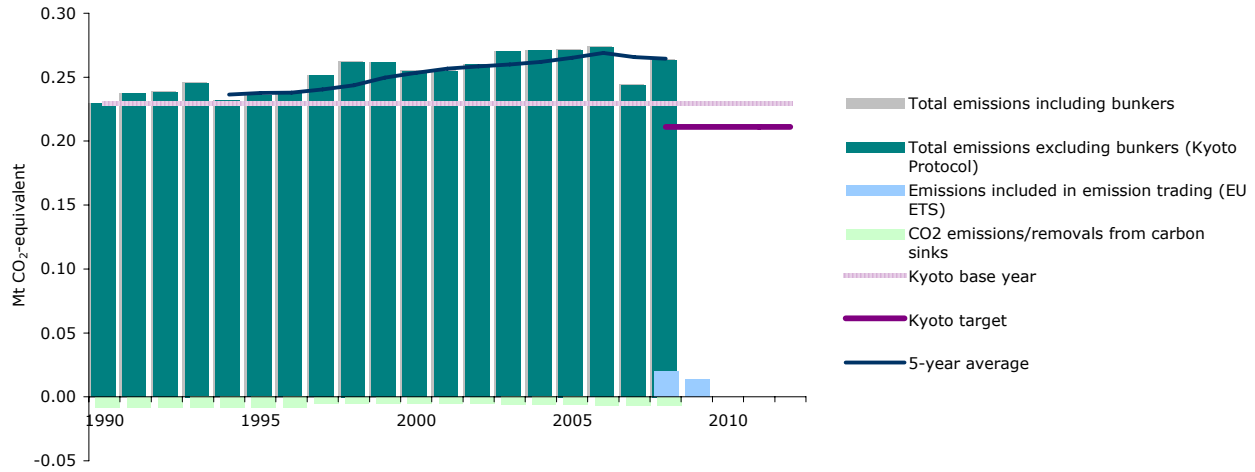
[3] Comparison of 2008 values, 1 = highest value among EU countries.

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

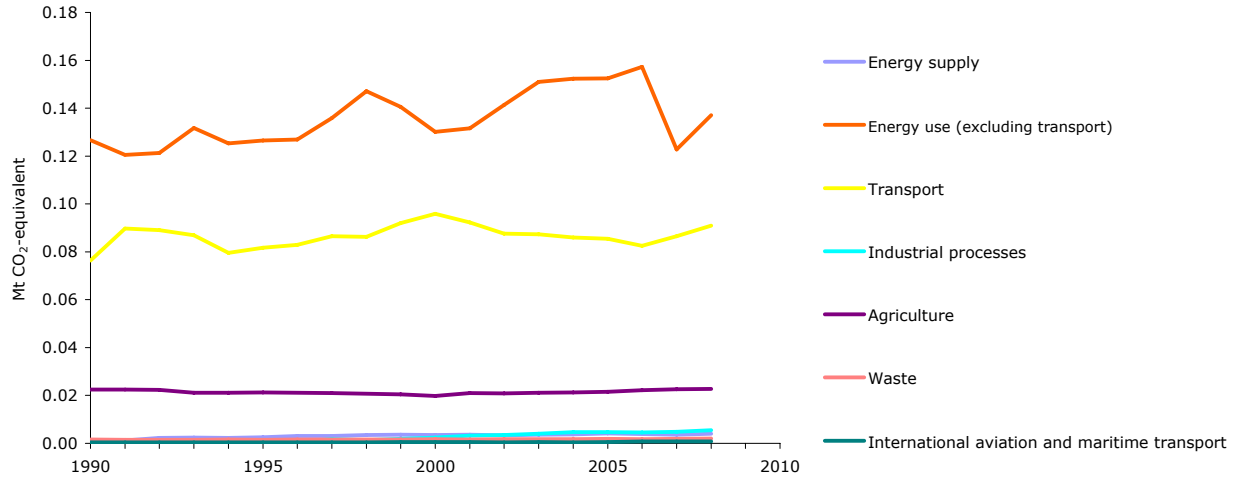
[5] GDP in constant 2000 prices - not suitable for a quantitative comparison between countries for the same year.

[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

GHG trends 1990–2008 - total emissions and removals



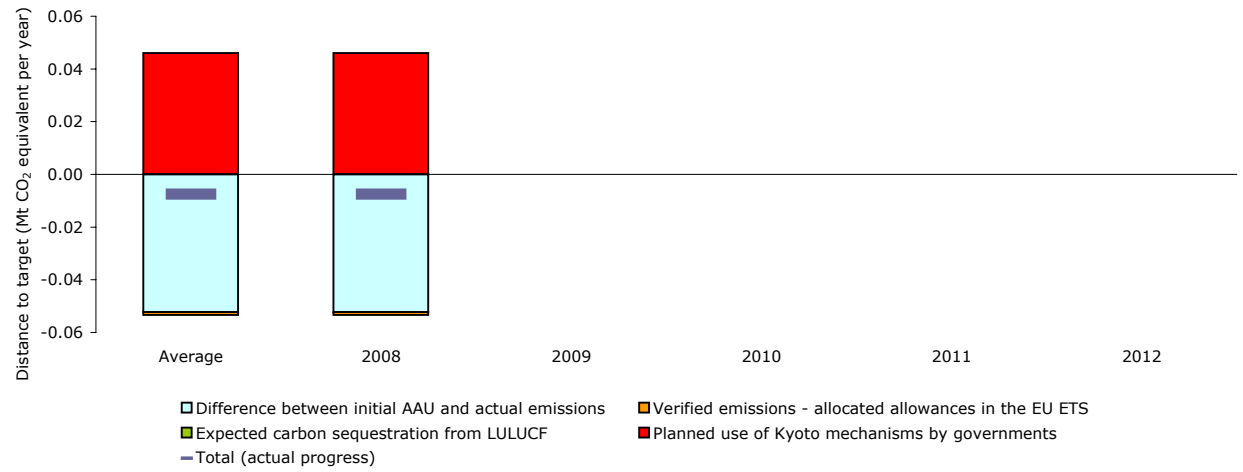
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in Liechtenstein in 2008 were 14.8 % higher than the base-year level, significantly above the Kyoto target of -8 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender less allowances than were issued to the EU ETS, decreasing the countries assigned amount by 0.5 % of base-year level emissions. Liechtenstein intends to acquire allowances corresponding to 20 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Liechtenstein stand currently above their target level, by a gap representing 3.3 % of the base-year emissions.



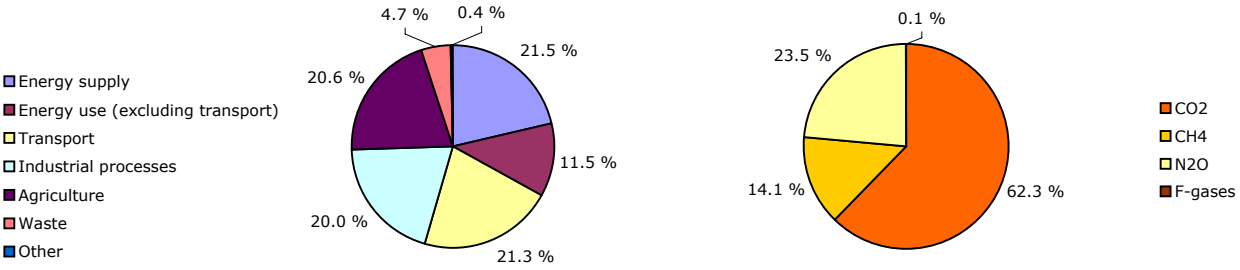
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Lithuania

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	49.7	25.5	24.3	n.a.	Mt CO_2-eq.	21	n.a.
GHG from international bunkers [4]	0.7	0.6	0.5	n.a.	Mt CO_2-eq.	25	n.a.
GHG per capita	13.5	7.5	7.2	n.a.	t CO_2-eq. / capita	23	n.a.
GHG per GDP [5]	2 895	1 193	1 110	n.a.	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	0.9 %	0.5 %	0.5 %	n.a.	%		
EU ETS verified emissions [6]		6.0	6.1	5.8	Mt CO_2-eq.	23	n.a.
Share of EU ETS verified emissions in total GHG		23.6 %	25.1 %	n.a.	%		
ETS verified emissions compared to annual allowances [7]		– 41.9 %	– 18.7 %	– 23.6 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 25.4	– 51.1 %	– 1.1	– 4.5 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
GHG per capita	– 6.2	– 46.3 %	– 0.3	– 3.9 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
EU ETS verified emissions - all installations			0.1	1.7 %			– 0.3	– 5.2 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 0.3	– 5.2 %

Assessment of long-term GHG trend (1990–2008)

The most significant reduction in GHG emissions was observed immediately after declaration of independence from 1991 to 1993 when total emissions decreased by more than 50 %, mainly due to sharp decline of activities in energy and industrial sectors. Emissions from manufacturing and construction industries decreased approximately 3 times. Reduction of GHG emissions in agriculture was less dramatic but still reached about 40 % in two years. After the 1990s, emissions have increased steadily until 2007, driven by economic development.

Assessment of short-term GHG trend (2007–2008)

The decrease in total emissions was mainly due to the emission reductions which occurred in the cement production and ammonia production industries. Important emission reductions also took place in the production of public electricity and heat and in the energy use by households and services. These latter reductions may be attributed to milder climatic conditions in 2008. After a continuous increase observed since 2000, transport emissions were stabilised. The highest increase in emissions was reported for petroleum refining.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

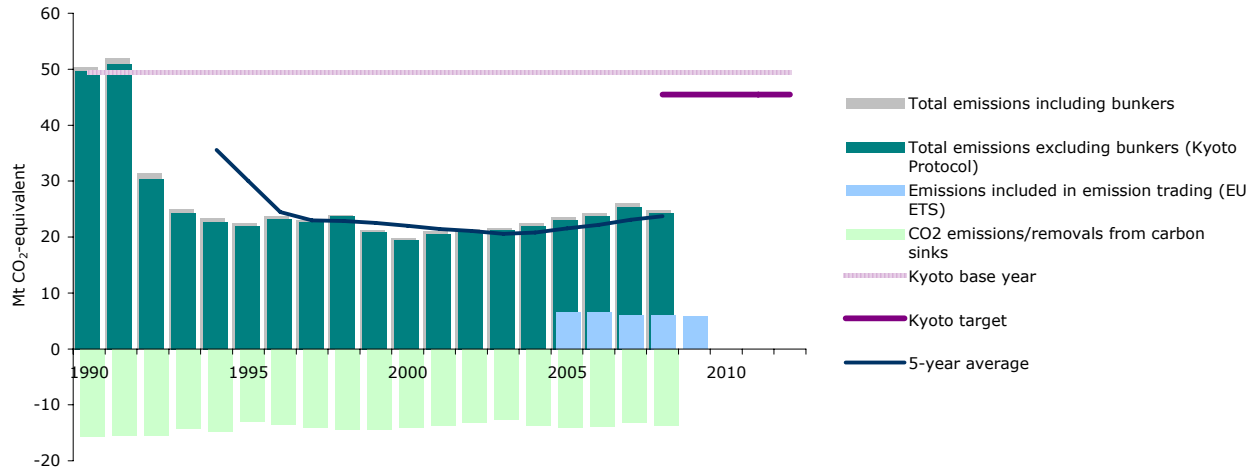
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

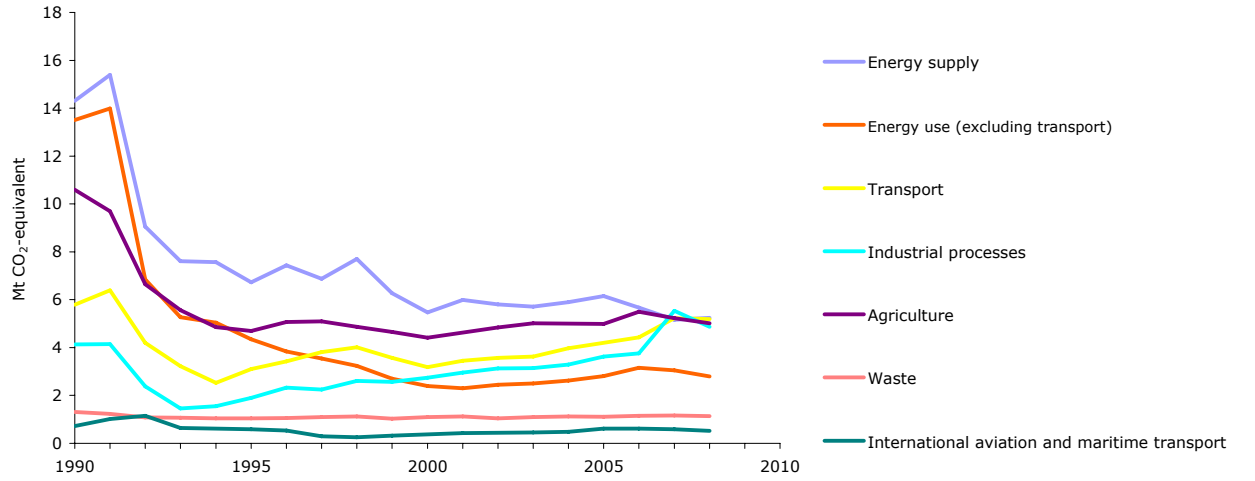
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2008 - total emissions and removals



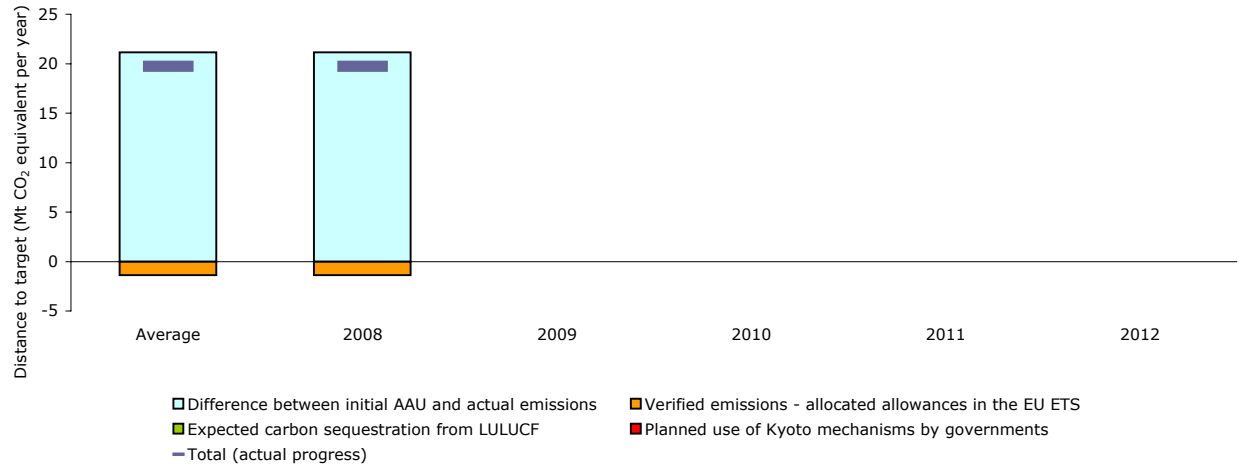
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in Lithuania in 2008 were 50.8 % lower than the base-year level, well below the Kyoto target of -8 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender less allowances than were issued to the EU ETS, decreasing the countries assigned amount by 2.8 % of base-year level emissions. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Lithuania stand currently below their target level, by a gap representing 39.9 % of the base-year emissions.



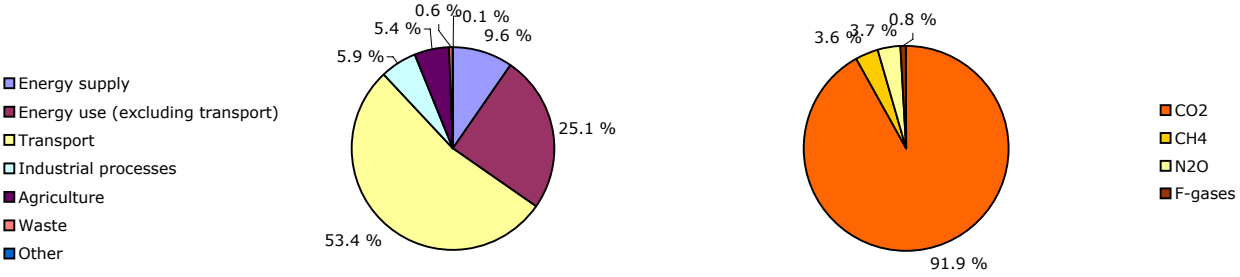
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Luxembourg

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	13.1	12.8	12.5	12.0	Mt CO_2-eq.	24	15
GHG from international bunkers [4]	0.4	1.3	1.3	n.a.	Mt CO_2-eq.	17	15
GHG per capita	34.6	26.9	25.8	24.3	t CO_2-eq. / capita	1	1
GHG per GDP [5]	975	434	423	421	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	0.2 %	0.3 %	0.3 %	0.3 %	%		
EU ETS verified emissions [6]		2.6	2.1	2.2	Mt CO_2-eq.	26	15
Share of EU ETS verified emissions in total GHG		20.1 %	16.8 %	18.2 %	%		
ETS verified emissions compared to annual allowances [7]		– 20.5 %	– 15.6 %	– 12.3 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 0.6	– 4.8 %	– 0.3	– 2.3 %	– 1.1	– 8.4 %	– 0.5	– 3.9 %
GHG per capita	– 8.8	– 25.3 %	– 1.0	– 3.9 %	– 10.2	– 29.6 %	– 1.5	– 3.9 %
EU ETS verified emissions - all installations			– 0.5	– 18.2 %			0.1	3.9 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			0.1	3.9 %

Assessment of long-term GHG trend (1990–2008)

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 due to road transport and power generation. They stabilized between 2004 and 2006 and then, in 2007, experienced 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 2008, combined with a diminution of GHG emissions from the power generation sector.

Assessment of short-term GHG trend (2007–2008)

Overall emission decreases were mainly the result of declining emissions from public electricity and heat production (considerable reduction in thermal power production) and from industry. These reductions were – to some extent – offset by emission increases from households and services due to colder winter months. Emissions from road transportation increased slightly; this category is by far the largest category in Luxembourg's GHG inventory mainly reflecting large 'road fuel exports' due to low road fuel prices.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

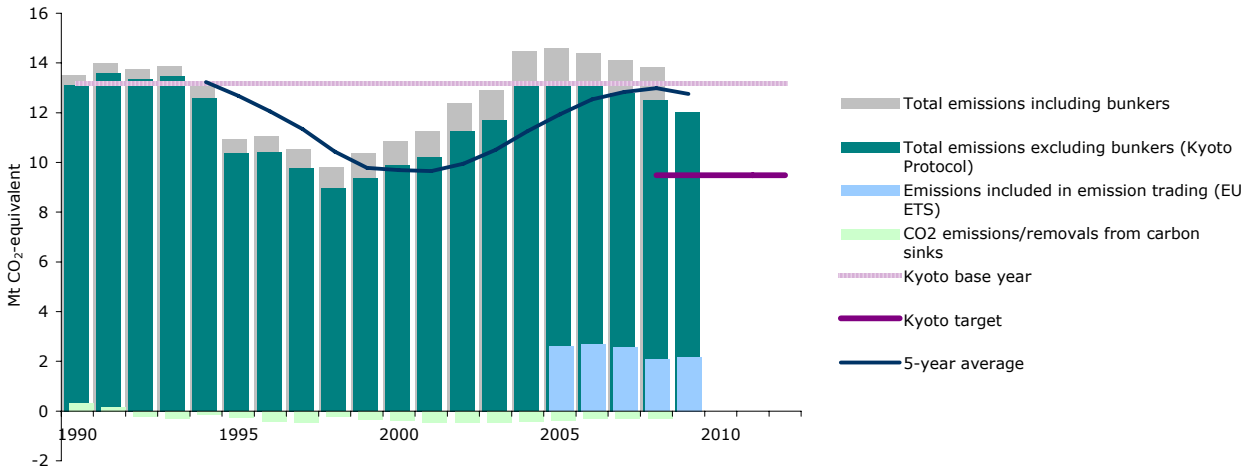
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

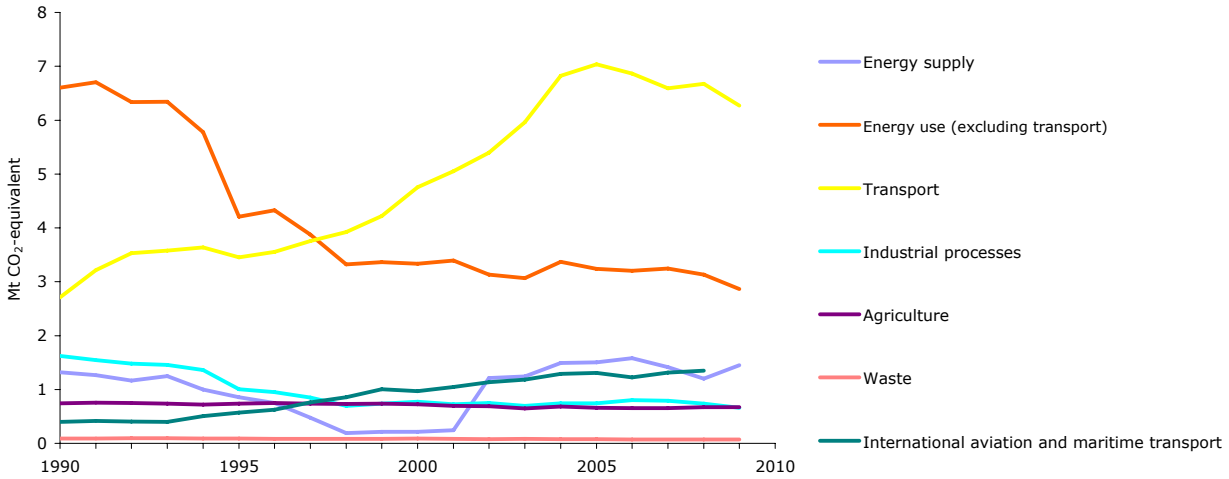
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2009 - total emissions and removals



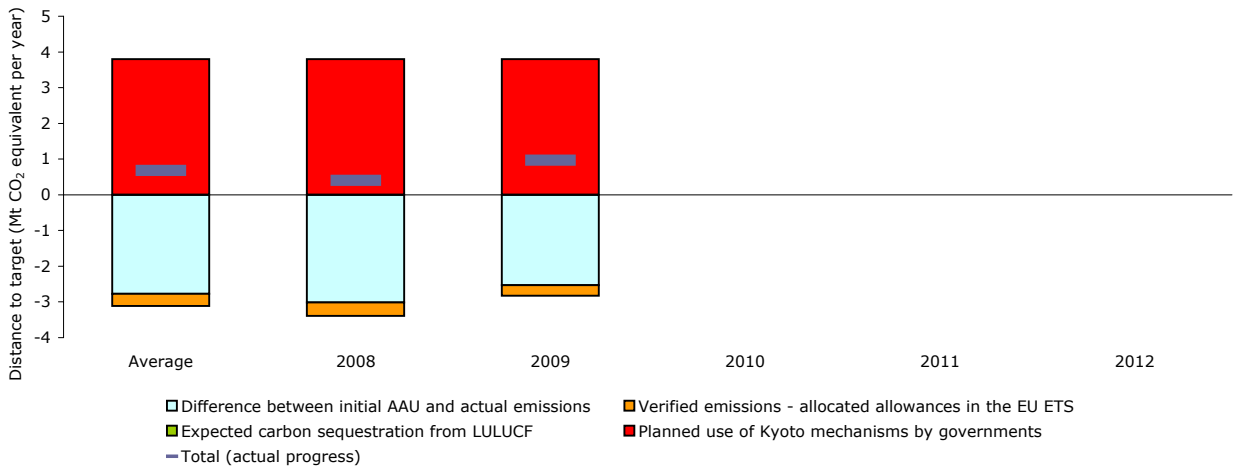
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Average emissions in Luxembourg in 2008–2009 were 7 % lower than the base-year level, significantly above the burden-sharing target of -28 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender less allowances than were issued to the EU ETS, decreasing the countries assigned amount by 2.6 % of base-year level emissions. Luxembourg intends to acquire allowances corresponding to 28.9 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Luxembourg stand currently below their target level, by a gap representing 5.2 % of the base-year emissions.



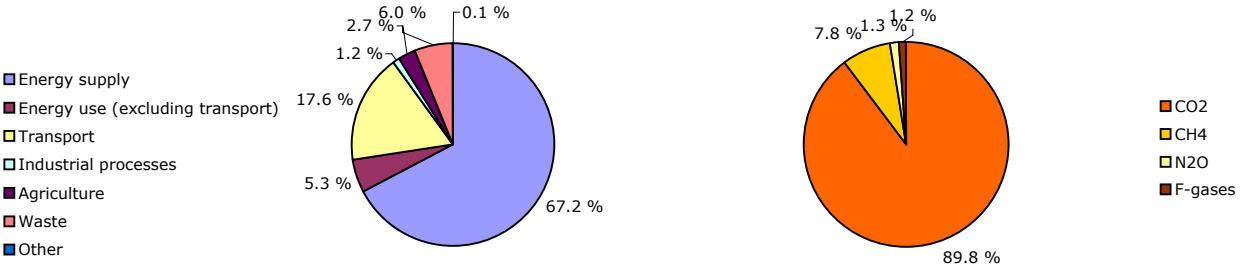
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Malta

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	2.0	3.0	3.0	n.a.	Mt CO_2-eq.	27	n.a.
GHG from international bunkers [4]	0.0	2.7	3.0	n.a.	Mt CO_2-eq.	14	n.a.
GHG per capita	5.8	7.4	7.2	n.a.	t CO_2-eq. / capita	24	n.a.
GHG per GDP [5]	n.a.	629	605	n.a.	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	0.0 %	0.1 %	0.1 %	n.a.	%		
EU ETS verified emissions [6]		2.0	2.0	1.9	Mt CO_2-eq.	27	n.a.
Share of EU ETS verified emissions in total GHG		67.4 %	68.4 %	n.a.	%		
ETS verified emissions compared to annual allowances [7]		– 11.3 %	– 4.2 %	– 10.6 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	0.9	44.2 %	– 0.1	– 1.8 %	n.a.	n.a.	n.a.	n.a.
GHG per capita	1.4	23.9 %	– 0.2	– 2.4 %	n.a.	n.a.	n.a.	n.a.
EU ETS verified emissions - all installations			– 0.0	– 0.4 %			– 0.1	– 6.0 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 0.1	– 6.0 %

Assessment of long-term GHG trend (1990–2008)

Emissions have increased by 49 %, with the largest contribution coming from CO2. On average, per capita emissions have risen from around 5.8 tonnes per head in 1990 to 7.2 tonnes per head in 2008. These trends reflect the socio-economic changes that have taken place over the past two decades, resulting in an increased demand for energy, with more waste generated and increased road transport.

Assessment of short-term GHG trend (2007–2008)

Malta experienced a slight emission decrease. The highest emission reductions resulted from energy industries, especially from public electricity and heat production and may be inked to milder climatic conditions (7 % decrease in heating degree days).

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 values, 1 = highest value among EU countries.

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

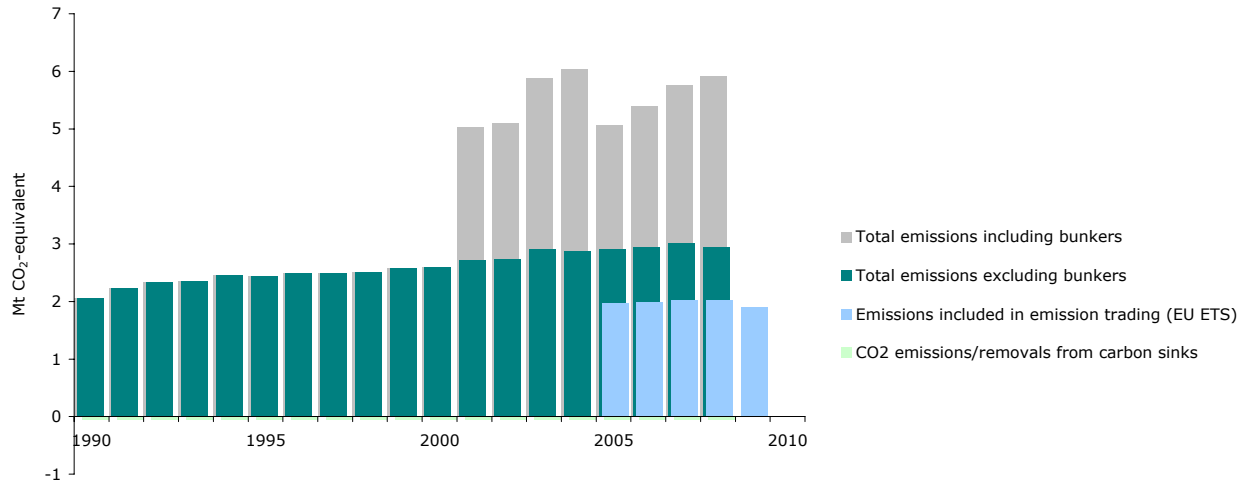
[5] GDP in constant 2000 prices - not suitable for a quantitative comparison between countries for the same year.

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

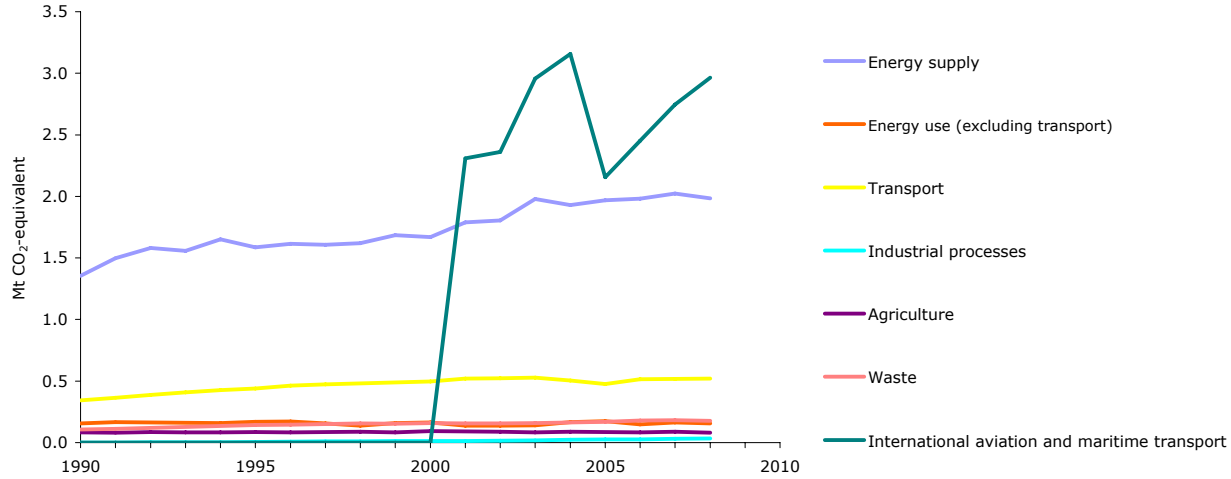
[7] "+" and "-" mean that verified emissions exceeded allowances or were below allowances, respectively. Annual allowances include allocated allowances and allowances auctioned during the same year.

[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

GHG trends 1990–2008 - total emissions and removals



GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

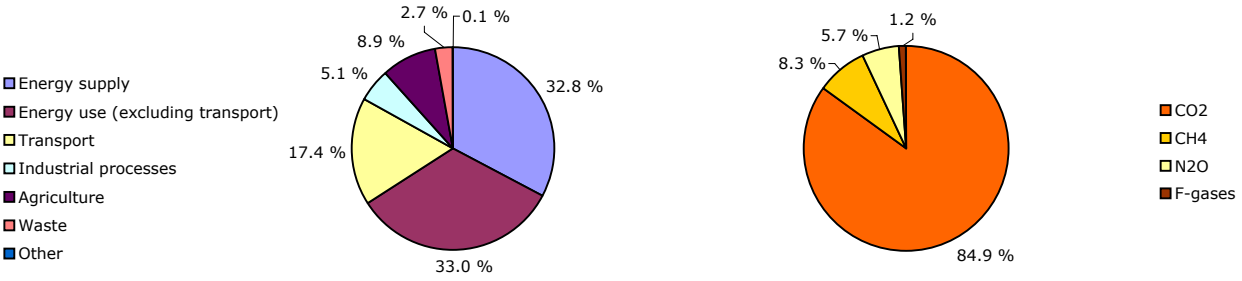
Malta does not have a target under the Kyoto Protocol.

GHG trends and projections in the Netherlands

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	212.0	206.9	206.9	201.1	Mt CO_2-eq.	7	6
GHG from international bunkers [4]	39.0	62.5	60.2	n.a.	Mt CO_2-eq.	1	1
GHG per capita	14.2	12.6	12.6	12.2	t CO_2-eq. / capita	7	4
GHG per GDP [5]	693	433	424	430	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	3.8 %	4.1 %	4.2 %	4.4 %	%		
EU ETS verified emissions [6]		79.9	83.5	81.1	Mt CO_2-eq.	7	6
Share of EU ETS verified emissions in total GHG		38.6 %	40.4 %	40.3 %	%		
ETS verified emissions compared to annual allowances [7]		– 7.6 %	8.8 %	– 3.3 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 5.1	– 2.4 %	– 0.0	– 0.0 %	– 10.9	– 5.1 %	– 5.8	– 2.8 %
GHG per capita	– 1.6	– 11.4 %	– 0.0	– 0.3 %	– 2.0	– 14.3 %	– 0.4	– 2.8 %
EU ETS verified emissions - all installations			3.6	4.6 %			– 2.4	– 2.9 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 2.0	– 2.4 %

Assessment of long-term GHG trend (1990–2008)

Overall, total emissions have remained relatively stable, with current levels slightly lower than in 1990. The 12 % increase in (mostly CO2) emissions from the energy sector, mainly observed in energy industries and road transport, was offset by emission reductions in other sectors. CH4 emissions decreased by 33 %. N2O emissions decreased by about 42 %, 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. Net emissions from LULUCF did not change significantly.

Assessment of short-term GHG trend (2007–2008)

Total emissions remained constant. Decreased emissions from nitric acid production were offset by increased emissions from households and services, where the use of gaseous fuels increased remarkably due to a colder winter.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

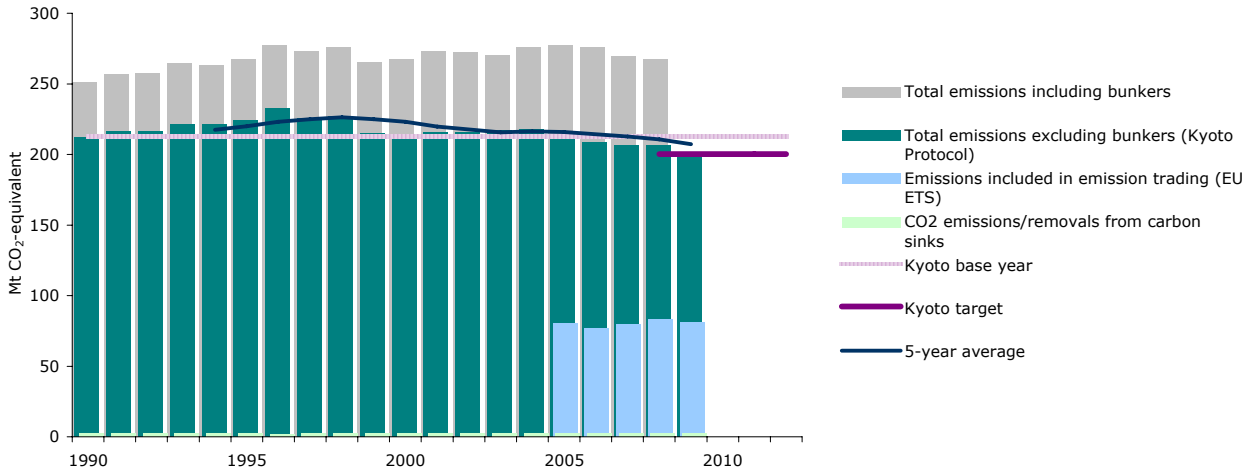
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

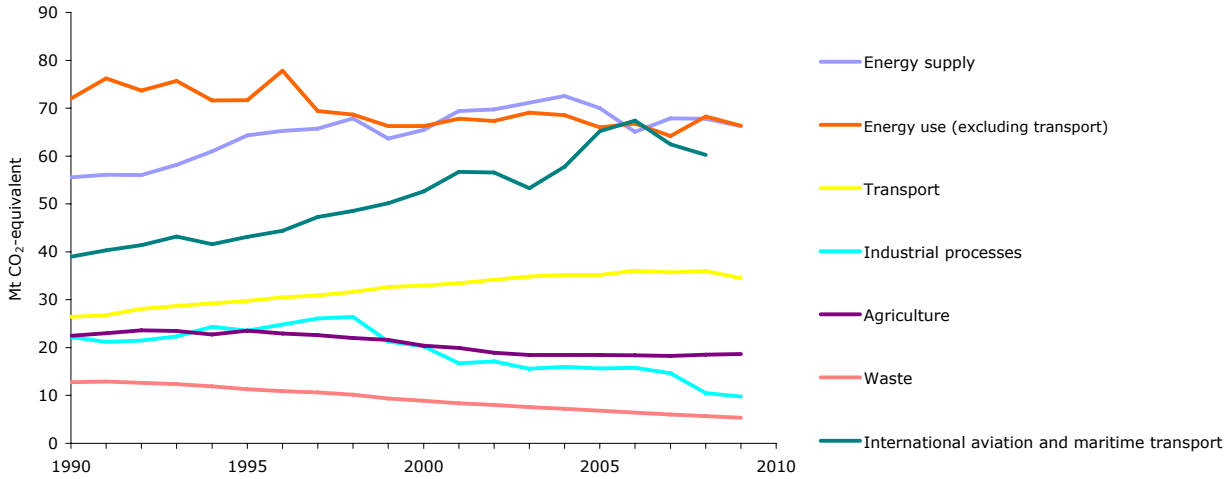
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2009 - total emissions and removals



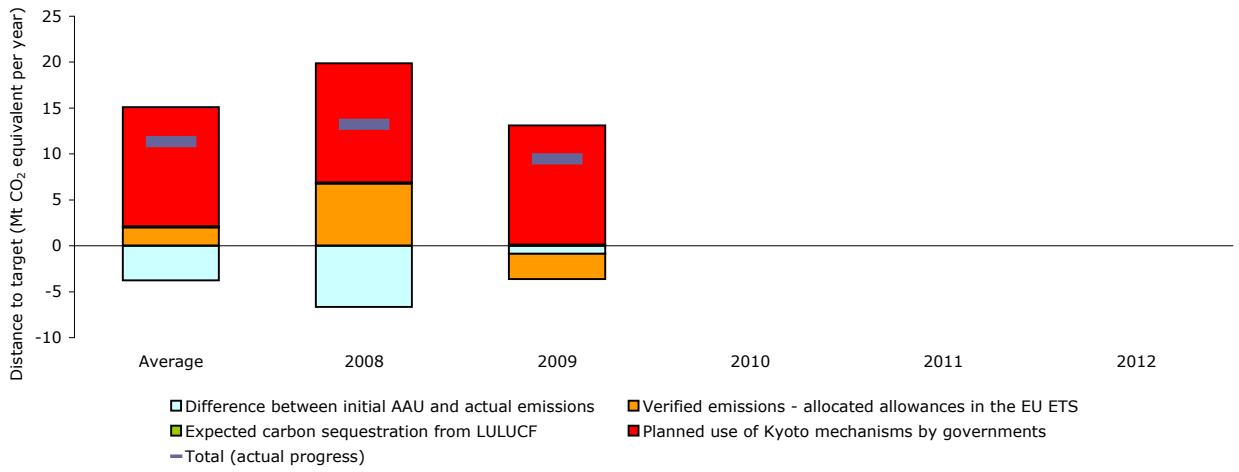
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Average emissions in Netherlands in 2008–2009 were 4.2 % lower than the base-year level, above the burden-sharing target of -6 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender more allowances than were issued to the EU ETS, increasing the countries assigned amount by 0.9 % of base-year level emissions. LULUCF activities are expected to decrease net emissions by 0.1 % of base-year level emissions. Netherlands intends to acquire allowances corresponding to 6.1 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Netherlands stand currently below their target level, by a gap representing 5.3 % of the base-year emissions.



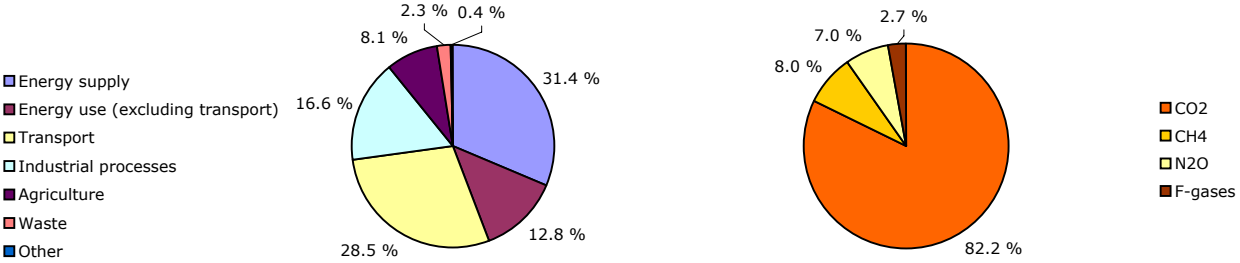
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Norway

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	49.7	55.1	53.7	50.8	Mt CO_2-eq.	n.a.	n.a.
GHG from international bunkers [4]	2.1	3.3	3.3	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG per capita	11.8	11.8	11.3	10.6	t CO_2-eq. / capita	n.a.	n.a.
GHG per GDP [5]	392	258	246	237	g CO_2-eq. / euro		
EU ETS verified emissions [6]		n.a.	19.3	19.2	Mt CO_2-eq.	n.a.	n.a.
Share of EU ETS verified emissions in total GHG		n.a.	n.a.	37.8 %	%		
ETS verified emissions compared to annual allowances [7]		n.a.	n.a.	– 7.0 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	4.0	8.0 %	– 1.4	– 2.6 %	1.1	2.1 %	– 2.9	– 5.4 %
GHG per capita	– 0.4	– 3.5 %	– 0.4	– 3.8 %	– 1.2	– 9.9 %	– 0.8	– 5.4 %
EU ETS verified emissions - all installations			n.a.	n.a.			– 0.1	– 0.6 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 0.1	– 0.7 %

Assessment of long-term GHG trend (1990–2008)

The overall economic growth since 1990 (with only minor setbacks in the early 1990s) has resulted in higher CO2 emissions from most sources, 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 (these reductions outweighed increased emissions from road traffic, fertilizer production, aluminium production and consumption of HFCs). 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).

Assessment of short-term GHG trend (2007–2008)

The decrease in emissions can be partly explained by lower activity at the end of the year for many transportation companies, as a result of the turbulence in the financial market. This is especially prominent in the freight transportation and taxi industry. Fugitive emissions from oil and natural gas also decreased, mainly due to increased regularity of production of the LNG plant, which started in 2007.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

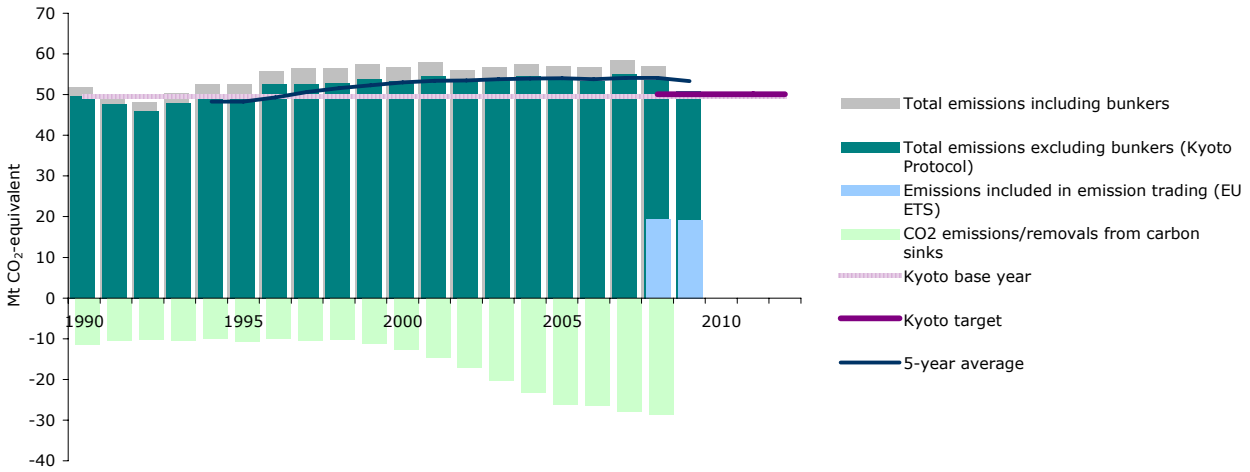
[1] Total greenhouse gas emissions (GHG), GHG per capita, GHG per GDP and shares of GHG do not include emissions and removals from LULUCF (carbon sinks) and emissions from international bunkers.

[2] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

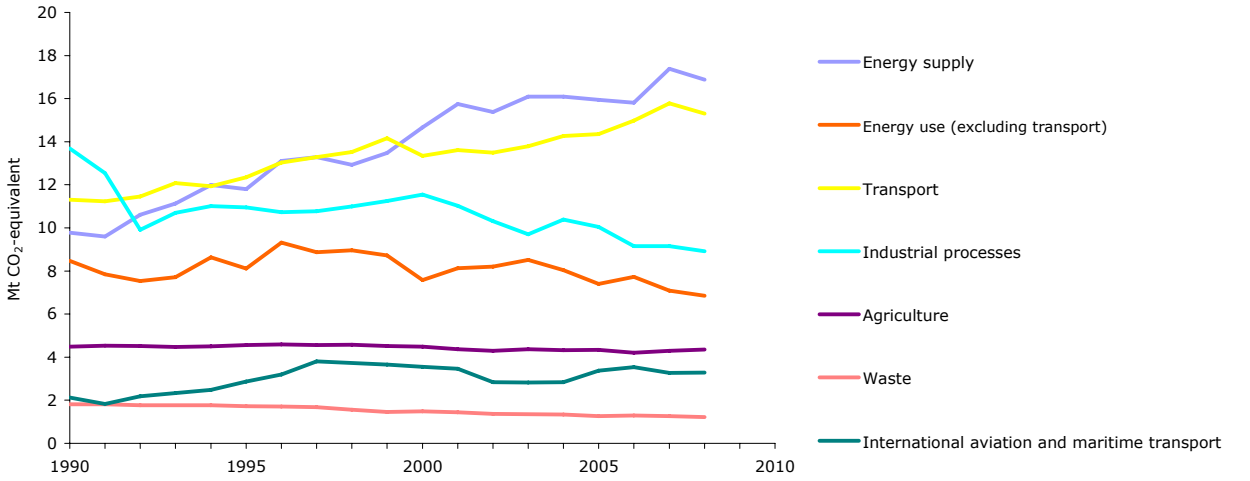
[3] Comparison of 2008 values, 1 = highest value among EU countries.

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

GHG trends 1990–2009 - total emissions and removals



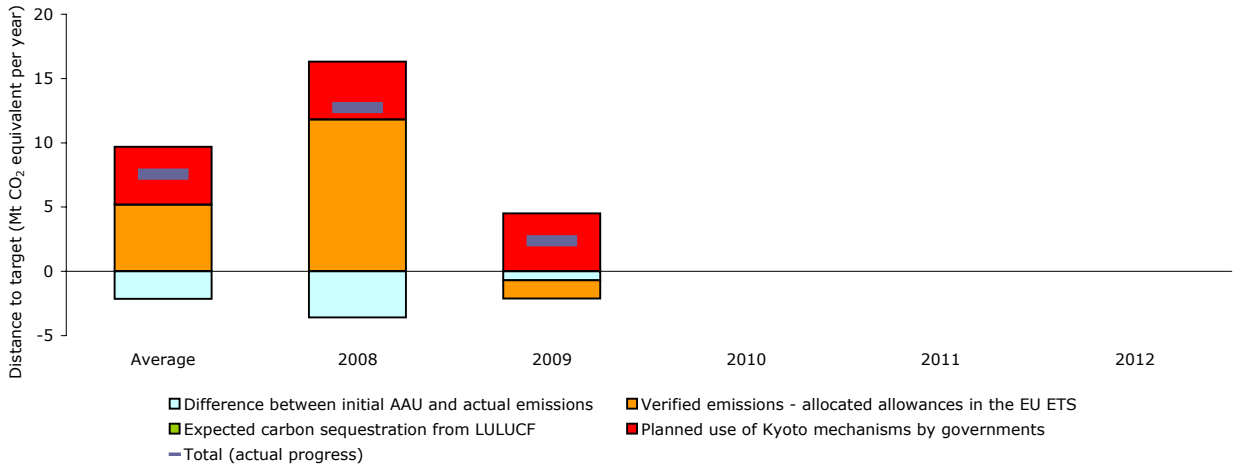
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Average emissions in Norway in 2008–2009 were 5.3 % higher than the base-year level, above the Kyoto target of 1 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender more allowances than were issued to the EU ETS, increasing the countries assigned amount by 10.5 % of base-year level emissions. Norway intends to acquire allowances corresponding to 9.1 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Norway stand currently below their target level, by a gap representing 15.2 % of the base-year emissions.



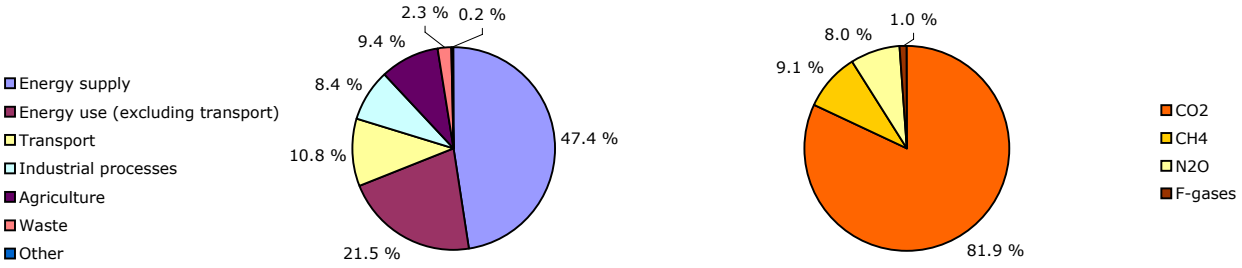
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Poland

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	453.3	399.9	395.6	n.a.	Mt CO_2-eq.	6	n.a.
GHG from international bunkers [4]	1.9	2.1	2.4	n.a.	Mt CO_2-eq.	15	n.a.
GHG per capita	11.9	10.5	10.4	n.a.	t CO_2-eq. / capita	14	n.a.
GHG per GDP [5]	3 538	1 631	1 536	n.a.	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	8.1 %	7.9 %	8.0 %	n.a.	%		
EU ETS verified emissions [6]		209.6	204.1	191.0	Mt CO_2-eq.	4	n.a.
Share of EU ETS verified emissions in total GHG		52.4 %	51.6 %	n.a.	%		
ETS verified emissions compared to annual allowances [7]		– 11.8 %	1.6 %	– 5.0 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 57.8	– 12.7 %	– 4.3	– 1.1 %	n.a.	n.a.	n.a.	n.a.
GHG per capita	– 1.5	– 12.9 %	– 0.1	– 1.1 %	n.a.	n.a.	n.a.	n.a.
EU ETS verified emissions - all installations			– 5.5	– 2.6 %			– 13.1	– 6.4 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 13.1	– 6.4 %

Assessment of long-term GHG trend (1990–2008)

Between 1988 and 1990, emissions decreased dramatically, triggered by significant economical changes, especially in heavy industry, related to political transformation from a centralized to market economy. Emissions continued to decline up to 1993, thereafter rising and peaking in 1996 as a result of modernization 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 policies and measures, followed by a slight increase up to 2006 caused by sustained economic development. Emissions slightly decreased in 2007 and 2008.

Assessment of short-term GHG trend (2007–2008)

The slight decrease in total emissions resulted from two opposing trends: the large reductions in emissions from energy industries (especially from public electricity and heat production, manufacture of solid fuels and other energy industries) and energy use in iron and steel industries were compensated by important increases in emissions from road transport and iron and steel production. The decrease in emissions from energy use may be due to a milder winter in 2008 compared to 2007.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

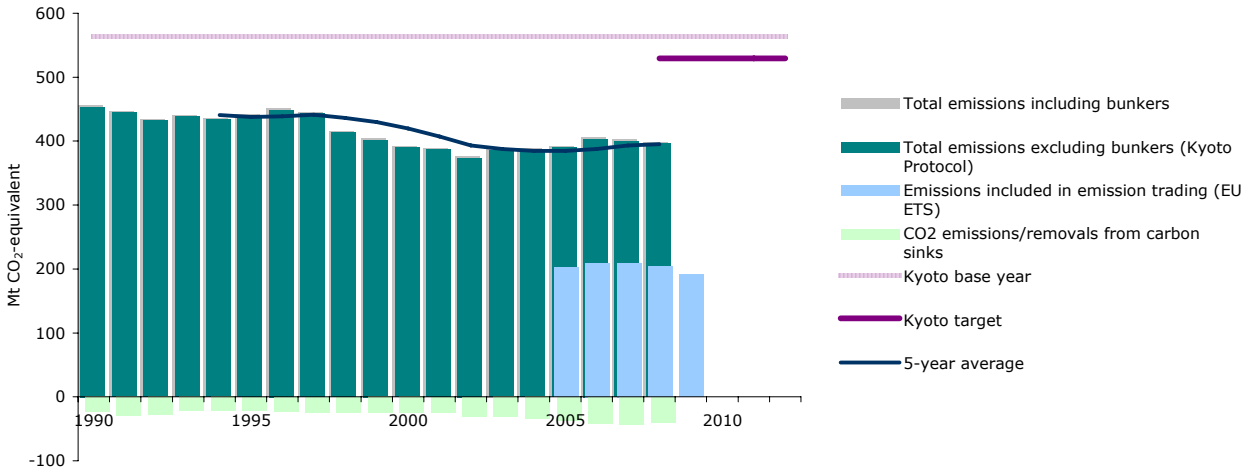
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

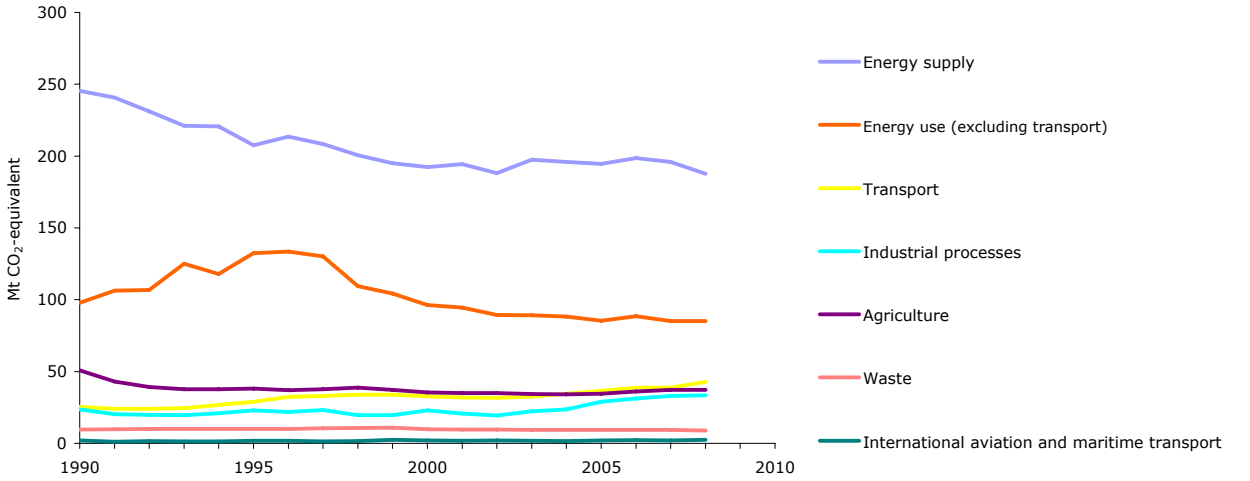
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2008 - total emissions and removals



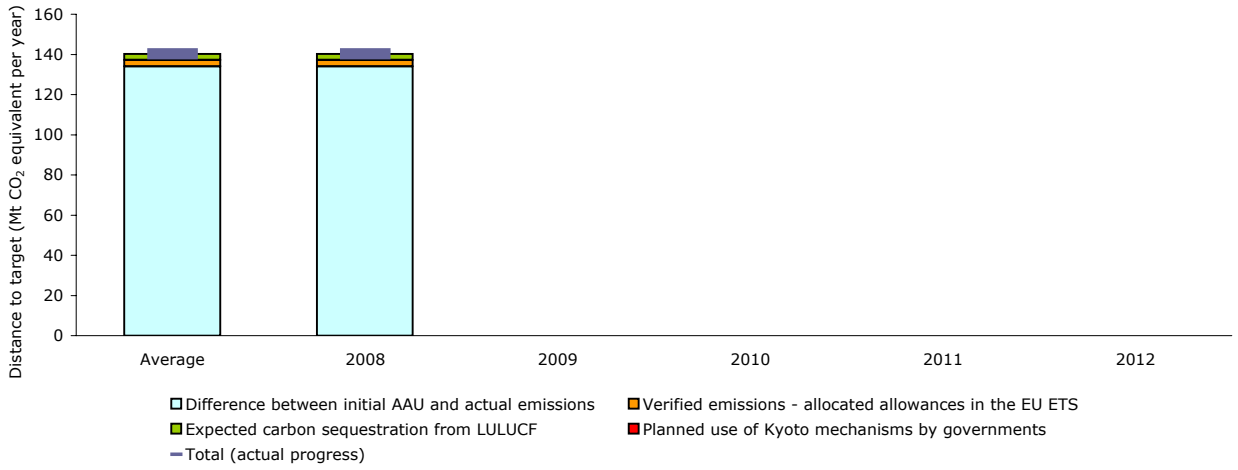
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in Poland in 2008 were 29.8 % lower than the base-year level, well below the Kyoto target of -6 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender more allowances than were issued to the EU ETS, increasing the countries assigned amount by 0.6 % of base-year level emissions. LULUCF activities are expected to decrease net emissions by 0.5 % of base-year level emissions. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Poland stand currently below their target level, by a gap representing 24.9 % of the base-year emissions.



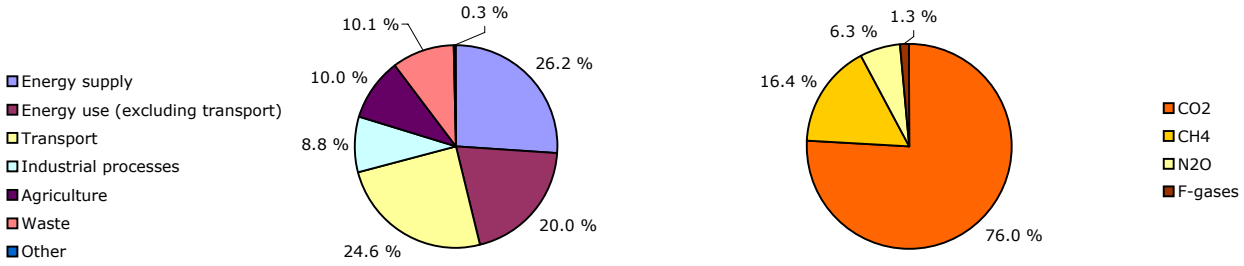
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Portugal

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	59.3	79.9	78.4	n.a.	Mt CO_2-eq.	13	10
GHG from international bunkers [4]	2.9	4.3	4.6	n.a.	Mt CO_2-eq.	11	11
GHG per capita	5.9	7.5	7.4	n.a.	t CO_2-eq. / capita	21	14
GHG per GDP [5]	651	606	594	n.a.	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	1.1 %	1.6 %	1.6 %	n.a.	%		
EU ETS verified emissions [6]		31.2	29.9	28.3	Mt CO_2-eq.	15	11
Share of EU ETS verified emissions in total GHG		39.1 %	38.2 %	n.a.	%		
ETS verified emissions compared to annual allowances [7]		– 15.4 %	– 1.9 %	– 7.4 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	19.1	32.2 %	– 1.5	– 1.9 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
GHG per capita	1.5	24.5 %	– 0.2	– 2.0 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
EU ETS verified emissions - all installations			– 1.3	– 4.2 %			– 1.7	– 5.6 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 2.1	– 7.1 %

Assessment of long-term GHG trend (1990–2008)

Emissions increased between 1990 and 2002, driven by strong economic growth, and have been stabilised or even reduced since 2005. A large increase occurred in the transport sector where emissions doubled between 1990 and 2002, due to the rapid growth in private car ownership; however emissions have been stabilised since. Emissions from the production of public electricity and heat increased also significantly, due to a continued increase of electricity demand in particular in the residential/commercial sector. Rising emissions from industrial processes are 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 decrease of fertilizer consumption. In the waste sector, emissions grew significantly in the 1990s, primarily because of rising waste generation and the deposition of waste in landfills.

Assessment of short-term GHG trend (2007–2008)

Emissions decreased in all sectors except waste. The largest decrease occurred in the production of public electricity and heat, followed by manufacturing industries and fuel combustion in households. Emissions from waste water handling increased.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009. 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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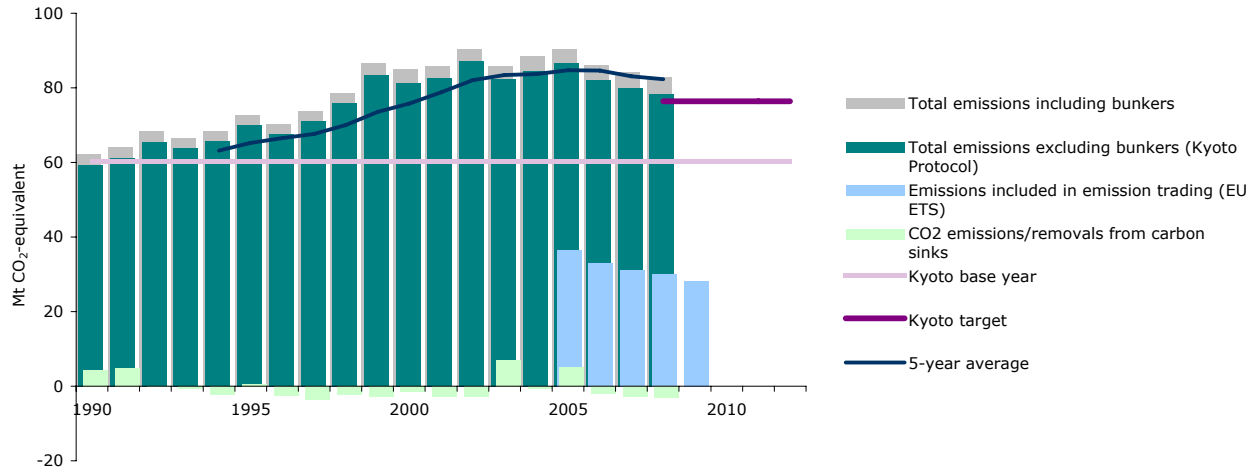
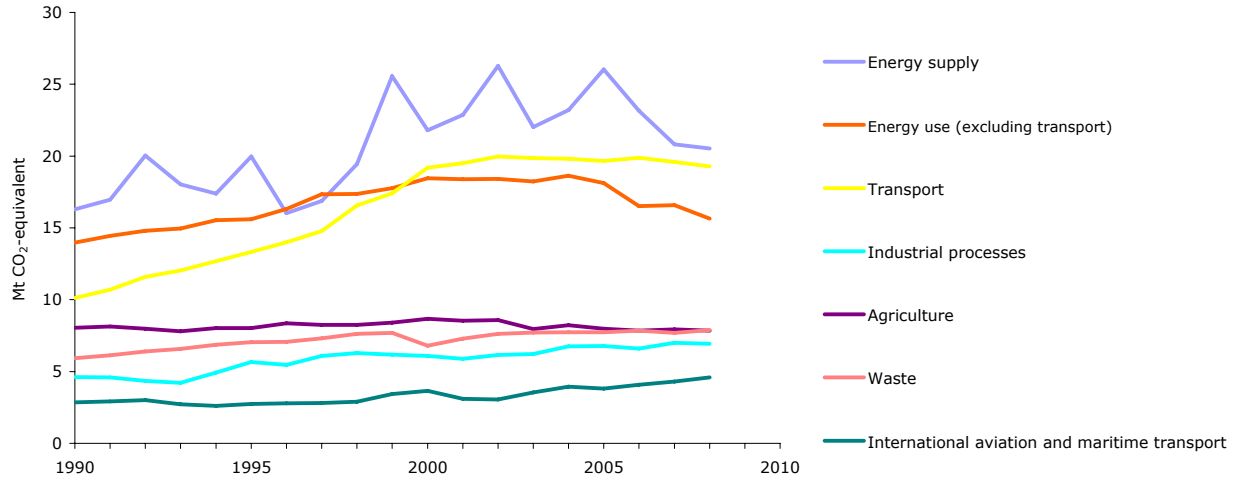
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2008 - total emissions and removals



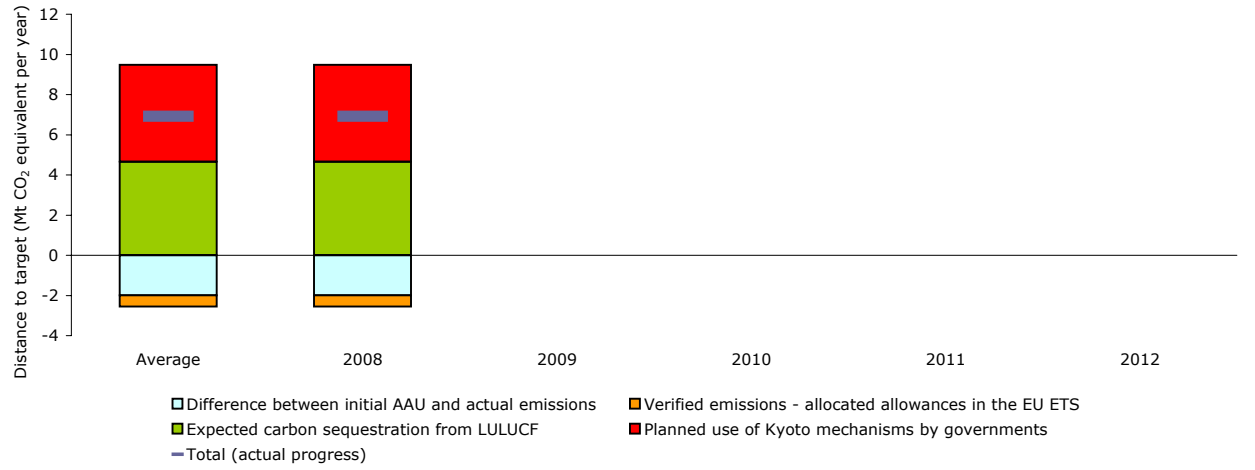
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in Portugal in 2008 were 30.3 % higher than the base-year level, above the Kyoto target of 27 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender less allowances than were issued to the EU ETS, decreasing the countries assigned amount by 0.9 % of base-year level emissions. LULUCF activities are expected to decrease net emissions by 7.7 % of base-year level emissions. Portugal intends to acquire allowances corresponding to 8 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Portugal stand currently below their target level, by a gap representing 11.5 % of the base-year emissions.



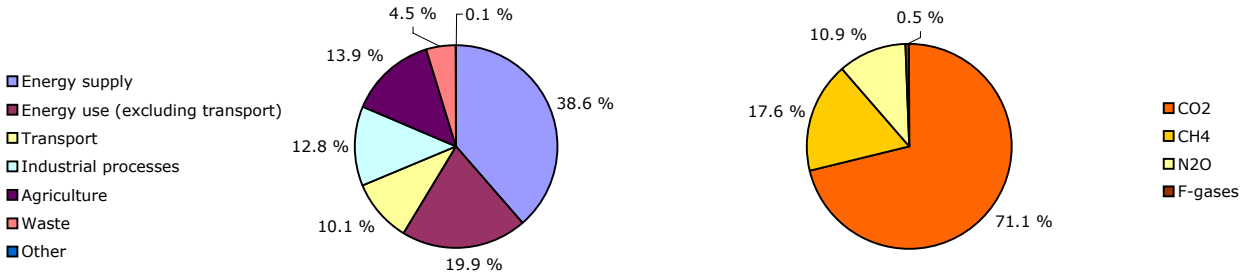
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Romania

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	242.1	152.6	145.9	n.a.	Mt CO_2-eq.	8	n.a.
GHG from international bunkers [4]	1.1	0.6	1.1	n.a.	Mt CO_2-eq.	20	n.a.
GHG per capita	10.4	7.1	6.8	n.a.	t CO_2-eq. / capita	26	n.a.
GHG per GDP [5]	5 026	2 479	2 208	n.a.	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	4.3 %	3.0 %	3.0 %	n.a.	%		
EU ETS verified emissions [6]		69.6	64.1	48.6	Mt CO_2-eq.	10	n.a.
Share of EU ETS verified emissions in total GHG		45.6 %	43.9 %	n.a.	%		
ETS verified emissions compared to annual allowances [7]		– 6.4 %	– 10.5 %	– 34.1 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 96.2	– 39.7 %	– 6.7	– 4.4 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
GHG per capita	– 3.7	– 35.0 %	– 0.3	– 4.2 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
EU ETS verified emissions - all installations			n.a.	n.a.			– 15.5	– 24.1 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 14.9	– 23.5 %

Assessment of long-term GHG trend (1990–2008)

Total emissions decreased significantly in the 1990s, following the transition process to a market economy but have been increasing since 1999. 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, 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. Emissions increased between 1999 and 2004 but seem to have been stabilised since.

Assessment of short-term GHG trend (2007–2008)

Emissions decreased slightly compared to 2007. The largest decreases were observed in public electricity and heat production followed by iron and steel production and households and services, while emissions from road transportation and agricultural soils increased noticeably.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

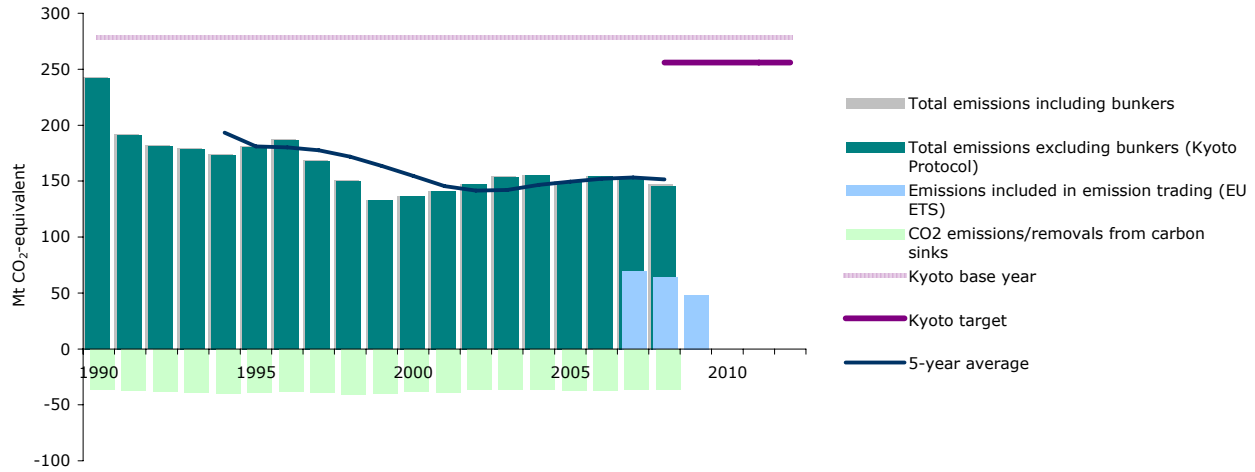
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

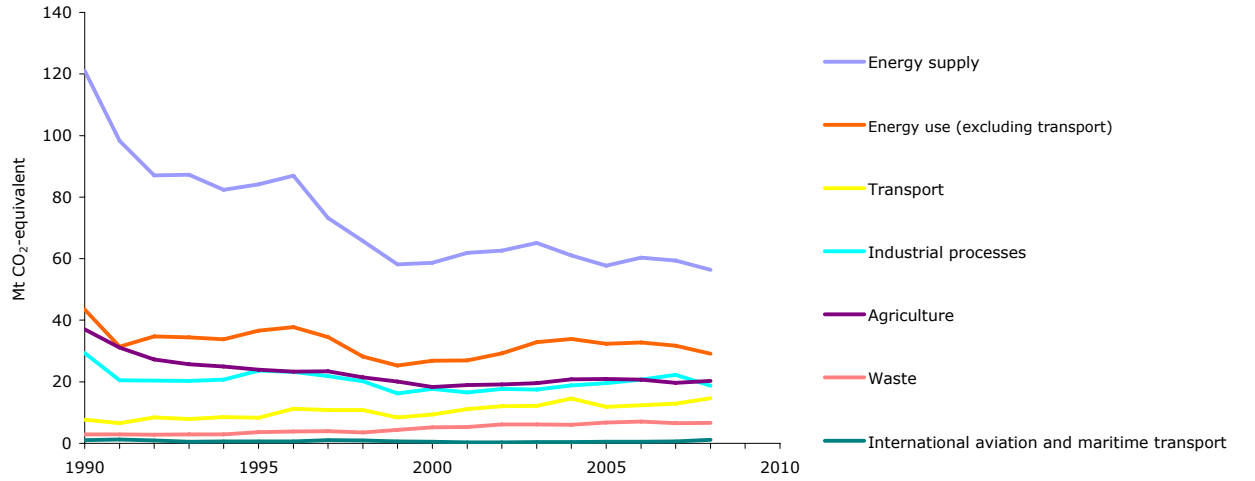
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2008 - total emissions and removals



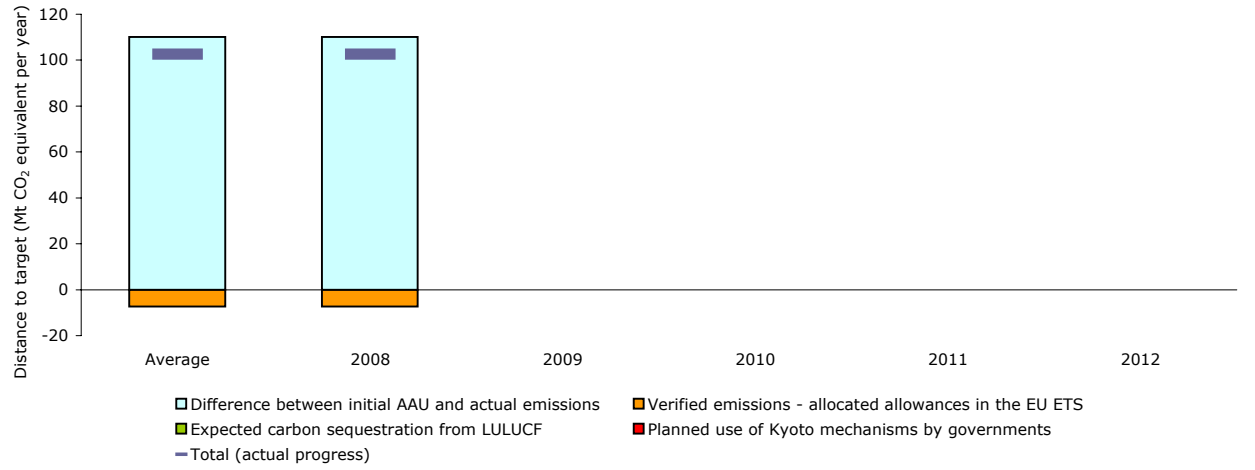
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in Romania in 2008 were 47.6 % lower than the base-year level, well below the Kyoto target of -8 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender less allowances than were issued to the EU ETS, decreasing the countries assigned amount by 2.7 % of base-year level emissions. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Romania stand currently below their target level, by a gap representing 36.9 % of the base-year emissions.



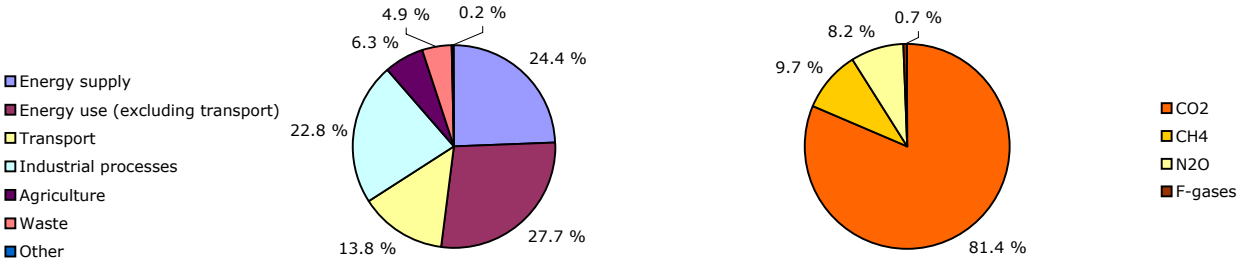
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Slovakia

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	73.9	47.7	48.8	46.0	Mt CO_2-eq.	20	n.a.
GHG from international bunkers [4]	0.1	0.2	0.2	n.a.	Mt CO_2-eq.	27	n.a.
GHG per capita	14.0	8.9	9.0	8.5	t CO_2-eq. / capita	18	n.a.
GHG per GDP [5]	n.a.	1 422	1 370	1 354	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	1.3 %	0.9 %	1.0 %	1.0 %	%		
EU ETS verified emissions [6]		24.5	25.3	21.6	Mt CO_2-eq.	18	n.a.
Share of EU ETS verified emissions in total GHG		51.4 %	51.9 %	46.9 %	%		
ETS verified emissions compared to annual allowances [7]		– 19.6 %	– 21.2 %	– 33.5 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 25.1	– 33.9 %	1.1	2.3 %	– 27.9	– 37.7 %	– 2.8	– 5.8 %
GHG per capita	– 4.9	– 35.3 %	0.2	2.1 %	– 5.5	– 39.2 %	– 0.5	– 5.8 %
EU ETS verified emissions - all installations			0.8	3.3 %			– 3.7	– 14.8 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 4.3	– 17.1 %

Assessment of long-term GHG trend (1990–2008)

Total emissions decreased significantly in the 1990s and have remained relatively stable since. The decreasing trend was mainly driven by decreases in the energy and agriculture sectors. Important decreases were observed in particular in emissions from public electricity and heat generation and from energy use in manufacturing industries and households/services. Emissions from transport, waste and industrial processes increased.

Assessment of short-term GHG trend (2007–2008)

Emissions increased slightly, mainly due to fuel combustion. The highest increase was observed in emissions from chemicals, followed by petroleum refining and public electricity and heat production. A remarkable decrease occurred in the iron and steel industry, both in terms of energy use and process emissions.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

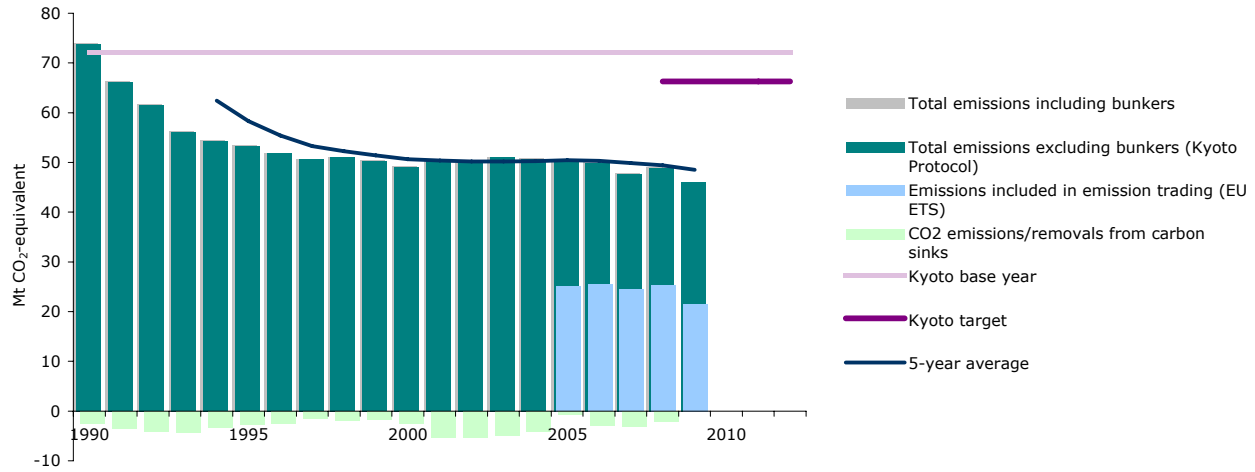
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

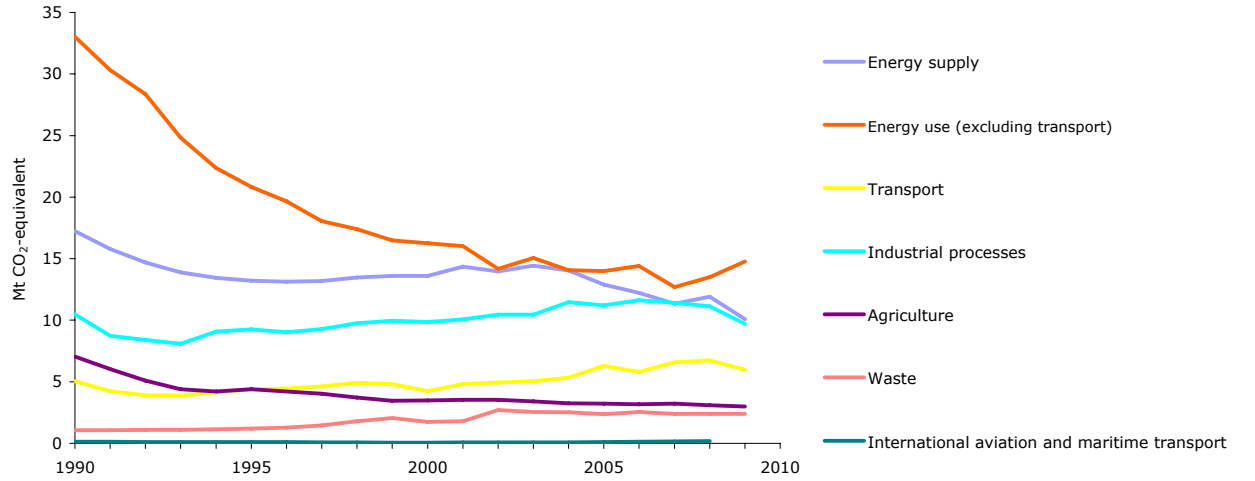
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2009 - total emissions and removals



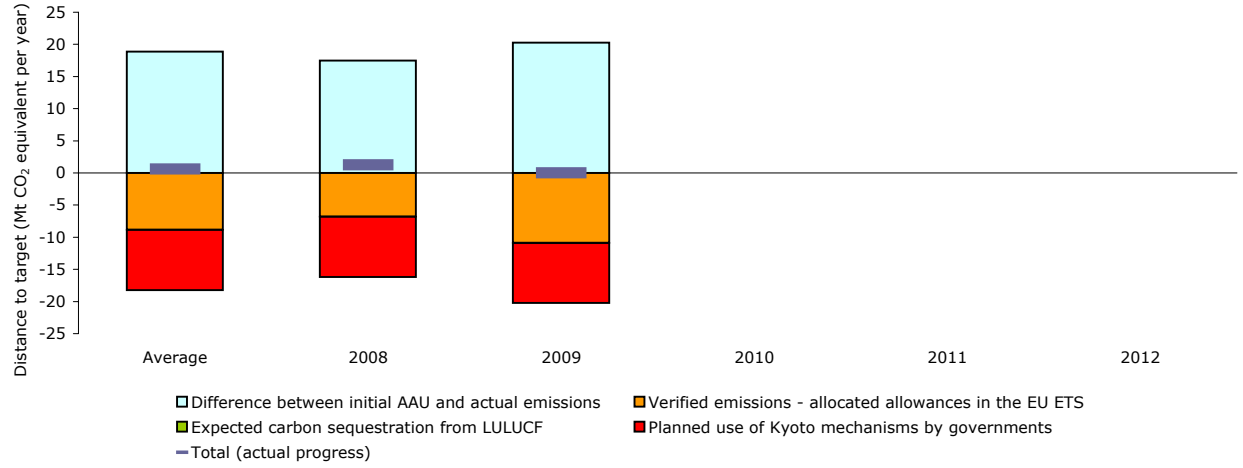
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Average emissions in Slovakia in 2008–2009 were 34.2 % lower than the base-year level, well below the Kyoto target of -8 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender less allowances than were issued to the EU ETS, decreasing the countries assigned amount by 12.3 % of base-year level emissions. Slovakia intends to sell allowances corresponding to 13 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Slovakia stand currently below their target level, by a gap representing 0.8 % of the base-year emissions.



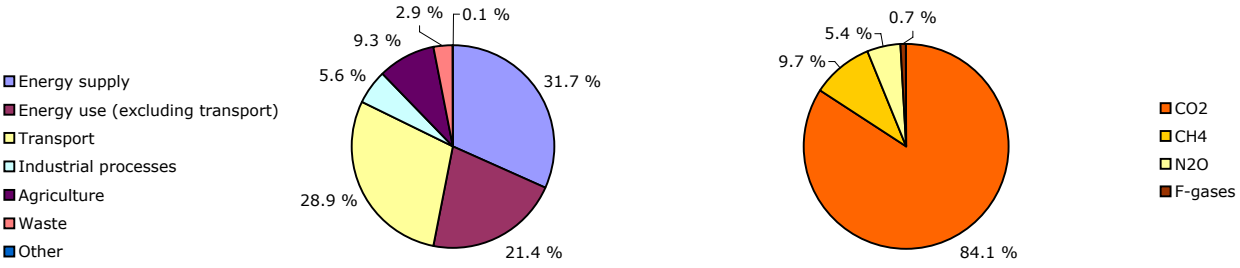
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Slovenia

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	18.5	20.6	21.3	20.0	Mt CO_2-eq.	22	n.a.
GHG from international bunkers [4]	0.1	0.3	0.3	n.a.	Mt CO_2-eq.	26	n.a.
GHG per capita	9.3	10.2	10.6	9.9	t CO_2-eq. / capita	12	n.a.
GHG per GDP [5]	1 036	709	709	724	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 [6]		9.0	8.9	8.1	Mt CO_2-eq.	22	n.a.
Share of EU ETS verified emissions in total GHG		44.0 %	41.6 %	40.3 %	%		
ETS verified emissions compared to annual allowances [7]		9.7 %	7.9 %	– 1.8 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	2.8	15.2 %	0.7	3.5 %	1.6	8.4 %	– 1.2	– 5.9 %
GHG per capita	1.3	14.4 %	0.4	3.5 %	0.6	6.5 %	– 0.7	– 5.9 %
EU ETS verified emissions - all installations			– 0.2	– 2.1 %			– 0.8	– 9.0 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 0.8	– 9.0 %

Assessment of long-term GHG trend (1990–2008)

The continuous increase in emissions since the early 1990s is mainly caused by road transport and to a lesser extent by fuel combustion for electricity and heat production, consumption of HFCs and methane emissions from solid waste disposal sites. Decreases are 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 (2007–2008)

Emissions pursued their increasing trend, mainly driven by increases in fuel combustion. The biggest increase of GHG emissions was in road transport followed by increases in households and services (probably partly due to a colder winter than in 2007). The biggest absolute decrease in emissions was however observed in public electricity and heat production. Emissions from aluminium production also decreased by about 80 %.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

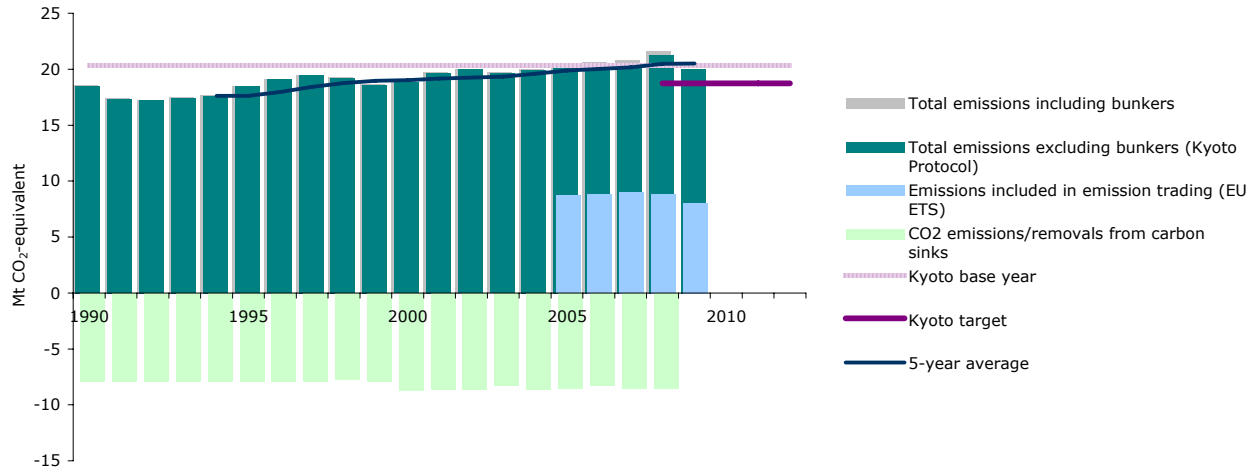
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

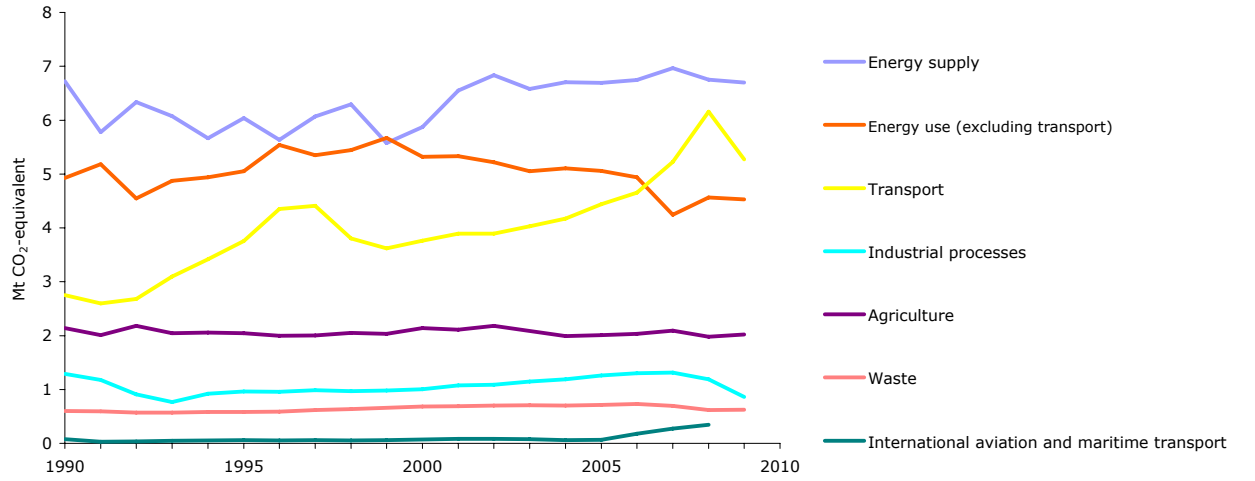
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2009 - total emissions and removals



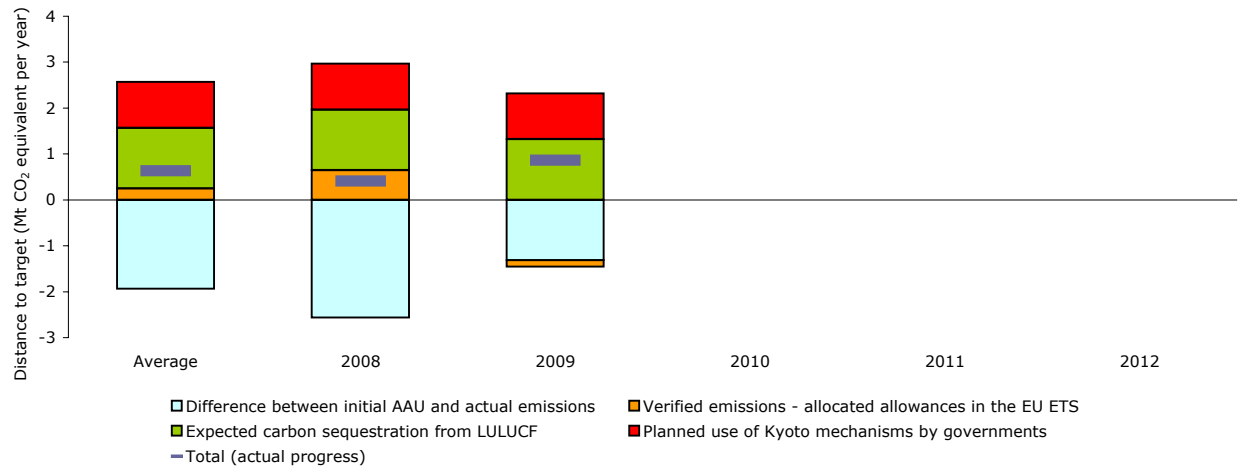
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Average emissions in Slovenia in 2008–2009 were 1.5 % higher than the base-year level, significantly above the Kyoto target of -8 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender more allowances than were issued to the EU ETS, increasing the countries assigned amount by 1.2 % of base-year level emissions. LULUCF activities are expected to decrease net emissions by 6.5 % of base-year level emissions. Slovenia intends to acquire allowances corresponding to 4.9 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Slovenia stand currently below their target level, by a gap representing 3.1 % of the base-year emissions.



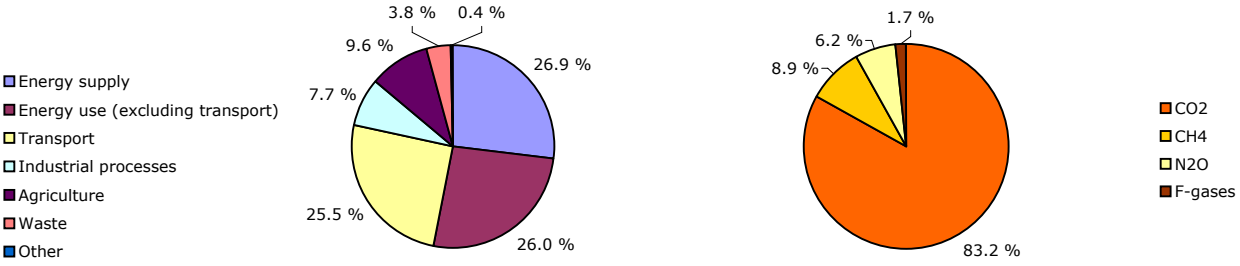
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Spain

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	285.1	438.7	405.7	372.4	Mt CO_2-eq.	5	5
GHG from international bunkers [4]	15.1	37.6	38.7	n.a.	Mt CO_2-eq.	3	3
GHG per capita	7.3	9.9	9.0	8.1	t CO_2-eq. / capita	19	12
GHG per GDP [5]	596	550	505	481	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	5.1 %	8.7 %	8.2 %	8.1 %	%		
EU ETS verified emissions [6]		186.6	163.5	136.9	Mt CO_2-eq.	5	4
Share of EU ETS verified emissions in total GHG		42.5 %	40.3 %	36.8 %	%		
ETS verified emissions compared to annual allowances [7]		16.8 %	6.1 %	– 9.3 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	120.6	42.3 %	– 32.9	– 7.5 %	87.3	30.6 %	– 33.3	– 8.2 %
GHG per capita	1.6	22.0 %	– 0.9	– 9.2 %	0.8	10.7 %	– 0.8	– 8.2 %
EU ETS verified emissions - all installations			– 23.1	– 12.4 %			– 26.5	– 16.2 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 26.7	– 16.3 %

Assessment of long-term GHG trend (1990–2008)

Overall, emissions have been marked by sustained growth in the period, except for the years 1993, 1996, 2006 and 2008, when reductions were recorded with respect to the preceding year. The growth during the 1990-1996 was more moderate than during the period 1996–2007. This variability over time seems to be correlated with the level of production of hydro-powered electricity as opposed to thermal power, although another series of additional factors such as the general expansion in fuel consumption and economic activity are at the core of the change in slope observed between the time periods 1990-1996 and 1996-2007.

Assessment of short-term GHG trend (2007–2008)

The marked decline in 2008 is the result of a combination of two significant elements: the dramatic change in the distribution of fuels used in the electricity generation sector (coal consumption for thermal power production decreased by 34 % whereas gas consumption increased by 30 %) and the impact of the economic recession, which led to a notable decline in sectors such as transport and industry, which have a major contribution to total emissions. Road transport emissions decreased for the first time since 1993.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

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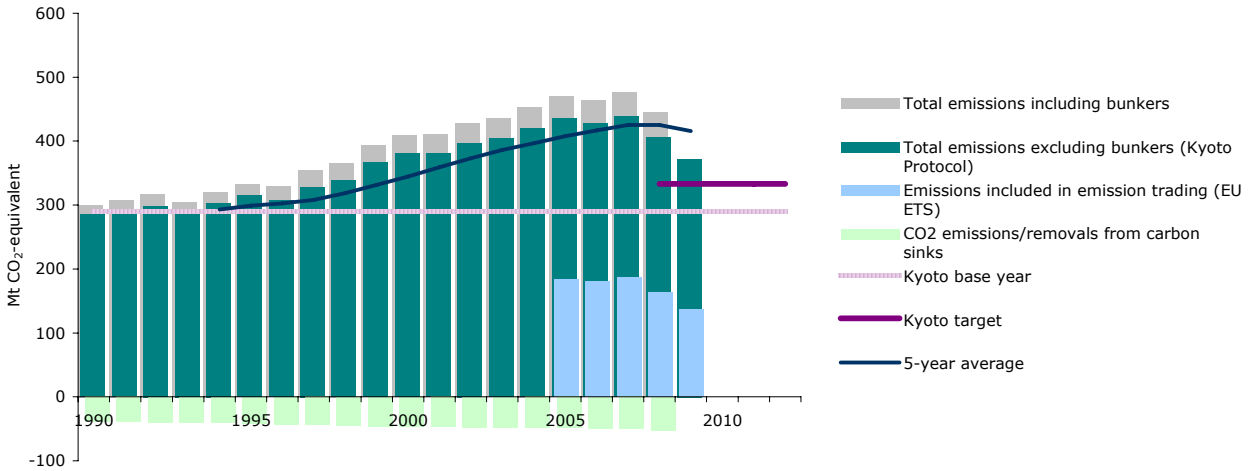
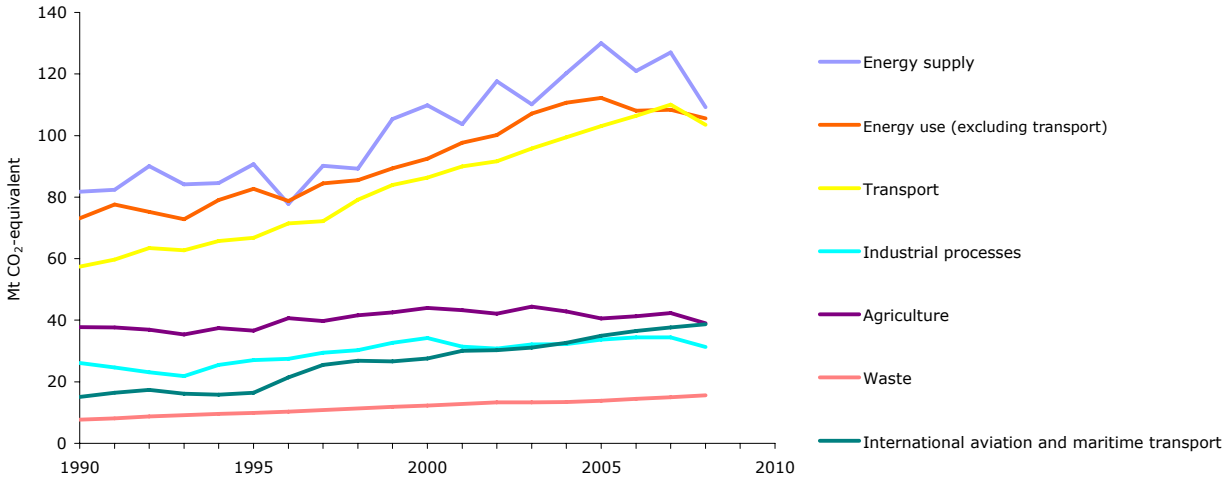
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2009 - total emissions and removals



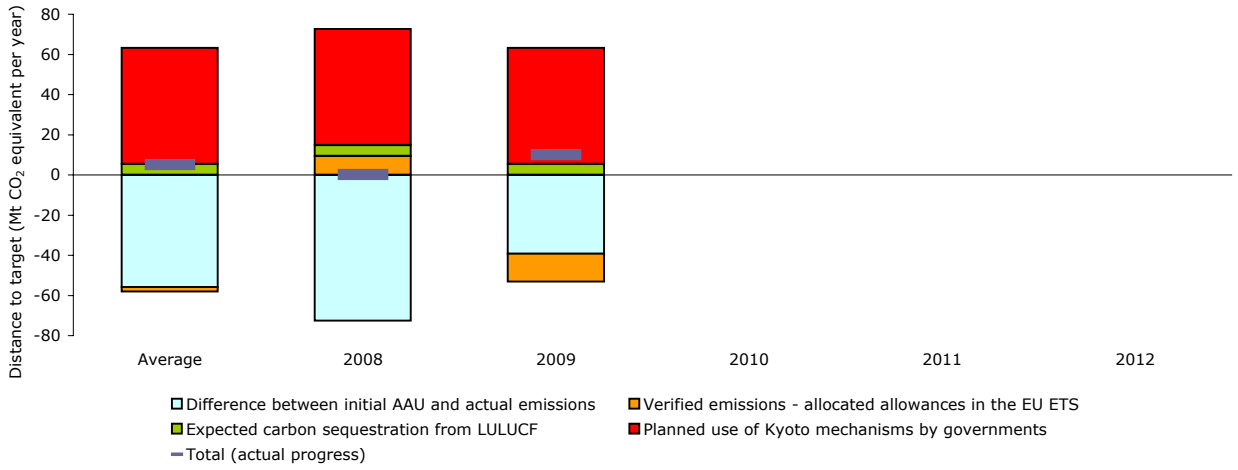
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Average emissions in Spain in 2008–2009 were 34.3 % higher than the base-year level, significantly above the burden-sharing target of 15 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender less allowances than were issued to the EU ETS, decreasing the countries assigned amount by 0.8 % of base-year level emissions. LULUCF activities are expected to decrease net emissions by 1.9 % of base-year level emissions. Spain intends to acquire allowances corresponding to 19.9 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Spain stand currently below their target level, by a gap representing 1.8 % of the base-year emissions.



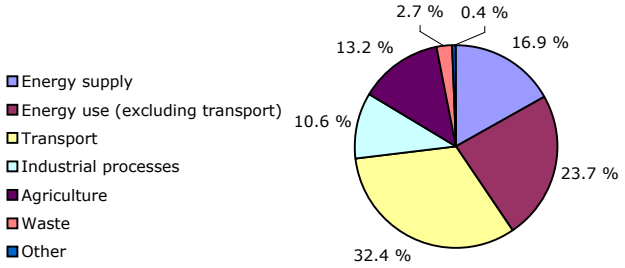
Note: A positive value indicates emissions lower than the average target.

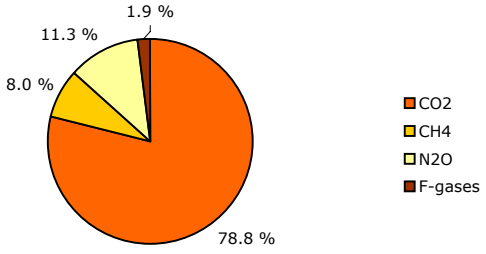
GHG trends and projections in Sweden

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	72.4	66.2	64.0	n.a.	Mt CO_2-eq.	18	13
GHG from international bunkers [4]	3.6	9.7	9.5	n.a.	Mt CO_2-eq.	9	9
GHG per capita	8.5	7.3	7.0	n.a.	t CO_2-eq. / capita	25	15
GHG per GDP [5]	331	205	198	n.a.	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	1.3 %	1.3 %	1.3 %	n.a.	%		
EU ETS verified emissions [6]		19.0	20.1	17.5	Mt CO_2-eq.	20	14
Share of EU ETS verified emissions in total GHG		28.8 %	31.4 %	n.a.	%		
ETS verified emissions compared to annual allowances [7]		– 16.7 %	– 3.4 %	– 17.2 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]





Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 8.5	– 11.7 %	– 2.2	– 3.3 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
GHG per capita	– 1.5	– 18.0 %	– 0.3	– 4.1 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
EU ETS verified emissions - all installations			1.0	5.4 %			– 2.6	– 12.9 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 2.6	– 12.9 %

Assessment of long-term GHG trend (1990–2008)

The large 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, although they have been stabilised or 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 varied, primarily because production volumes vary with economic cycles. In 2008 emissions were 8 % higher than in 1990. Emissions from agriculture decreased, mainly due to reduced livestock keeping. 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 (2007–2008)

Emissions decreased in all main categories. Major emission decreases are reported from industry and road transport mainly due to the beginning economic downturn.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

[3] Comparison of 2008 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 quantitative comparison between countries for the same year.

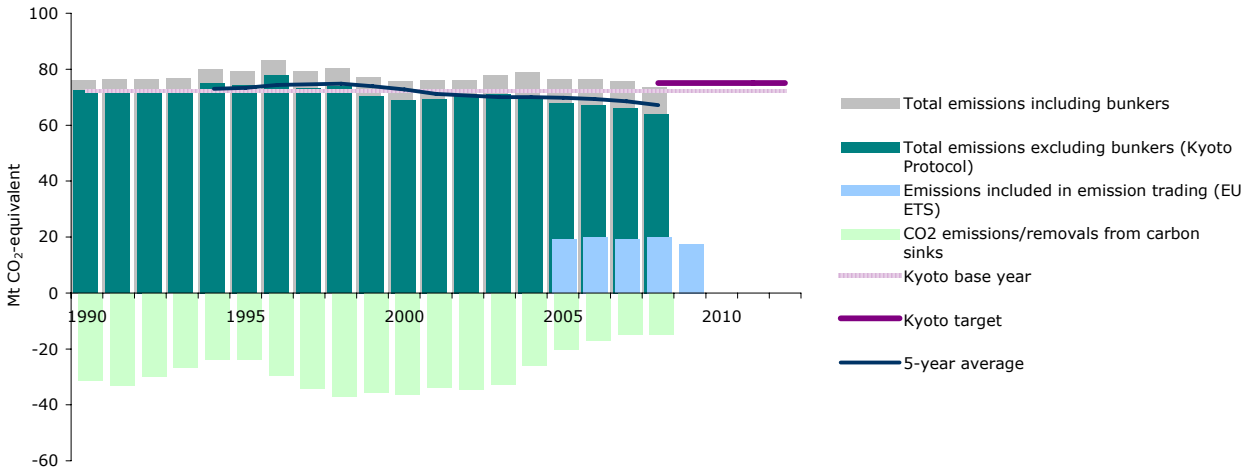
[6] All installations included. This includes new entrants and closures. Data from the community independent transaction log (CITL) released on 29 April 2009 for the reporting years 2005 and 2006, 11 May 2009 for the reporting year 2007 and data as of 17 May 2010 for the reporting year 2008 and 2009.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

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

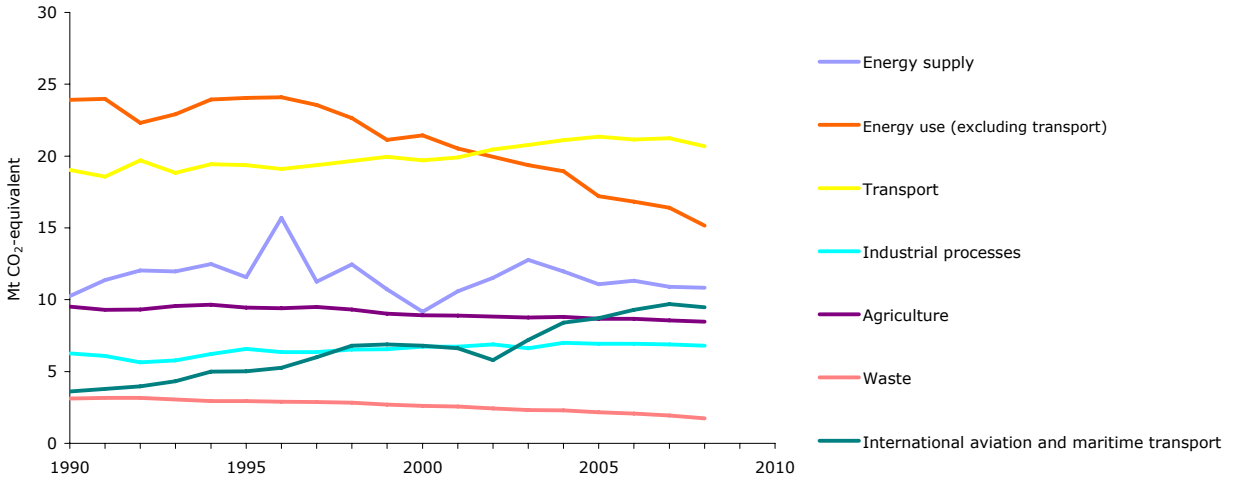
[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2008 - total emissions and removals



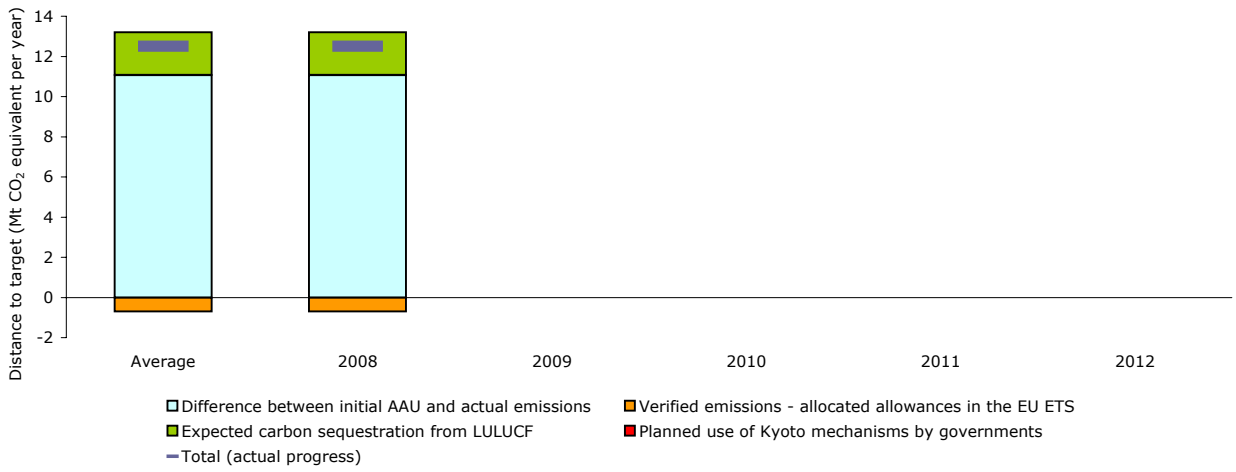
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Emissions in Sweden in 2008 were 11.3 % lower than the base-year level, well below the Kyoto target of 4 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender less allowances than were issued to the EU ETS, decreasing the countries assigned amount by 1 % of base-year level emissions. LULUCF activities are expected to decrease net emissions by 3 % of base-year level emissions. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in Sweden stand currently below their target level, by a gap representing 17.3 % of the base-year emissions.



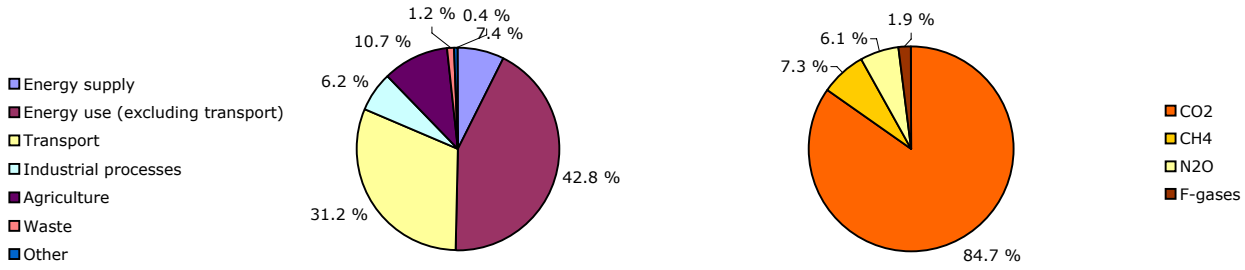
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Switzerland

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	53.0	51.6	53.2	52.0	Mt CO_2-eq.	n.a.	n.a.
GHG from international bunkers [4]	3.1	4.0	4.3	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG per capita	7.9	6.9	7.0	6.8	t CO_2-eq. / capita	n.a.	n.a.
GHG per GDP [5]	217	166	168	167	g CO_2-eq. / euro		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	0.3	0.5 %	1.6	3.1 %	– 0.9	– 1.7 %	– 1.2	– 2.2 %
GHG per capita	– 0.9	– 11.7 %	0.1	2.0 %	– 1.2	– 14.8 %	– 0.3	– 2.2 %

Assessment of long-term GHG trend (1990–2008)

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 (2007–2008)

Emissions increased in 2008, following an extraordinary decrease of emissions from households (energy use for heating) in 2007, which reflected the high prices for heating oil in 2007 and relatively milder winter that year. Transport emissions have continued their upward trend observed since 2002.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

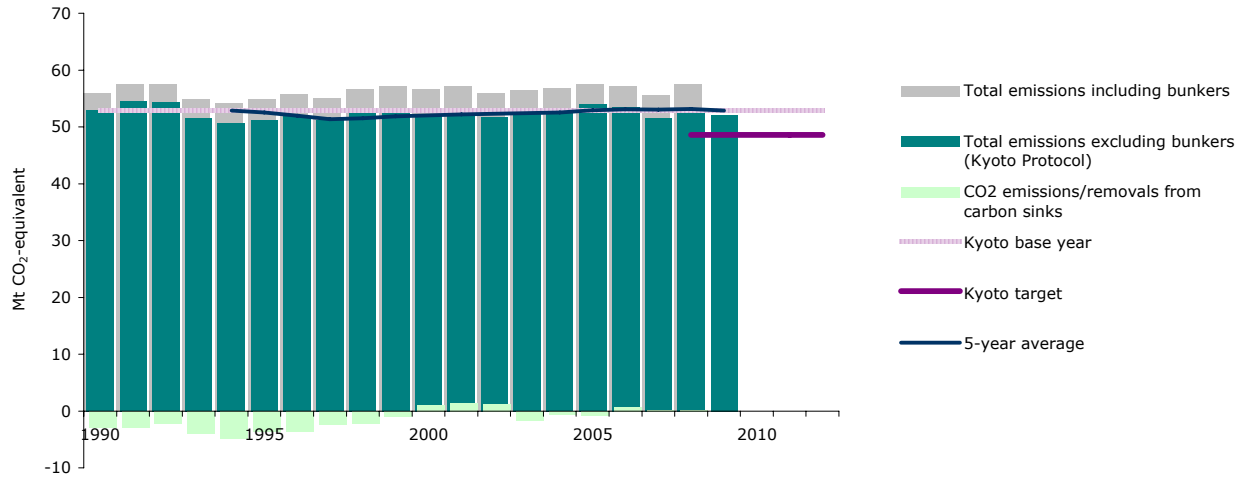
[3] Comparison of 2008 values, 1 = highest value among EU countries.

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

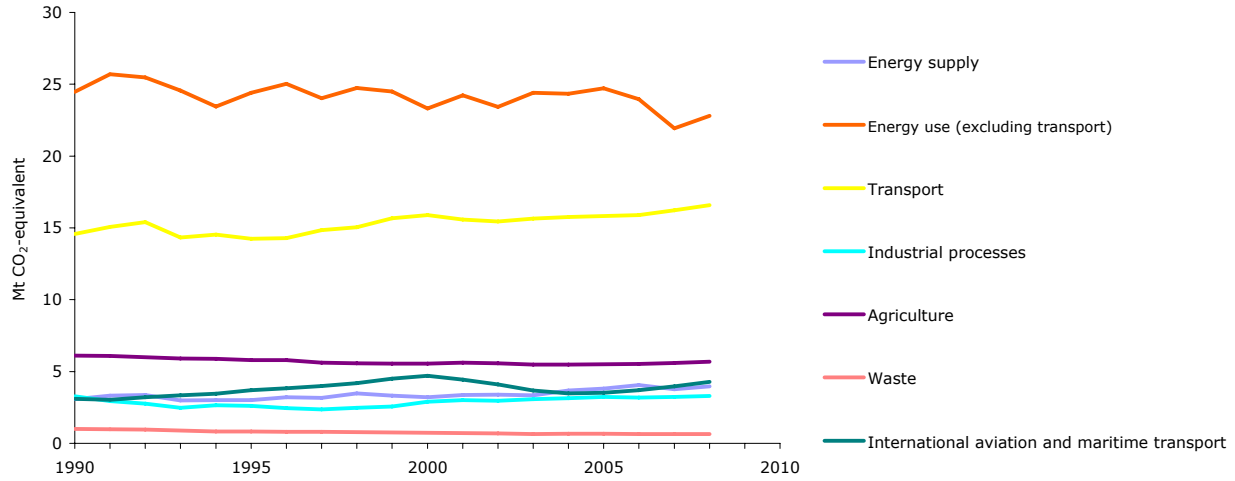
[5] GDP in constant 2000 prices - not suitable for a quantitative comparison between countries for the same year.

[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

GHG trends 1990–2009 - total emissions and removals



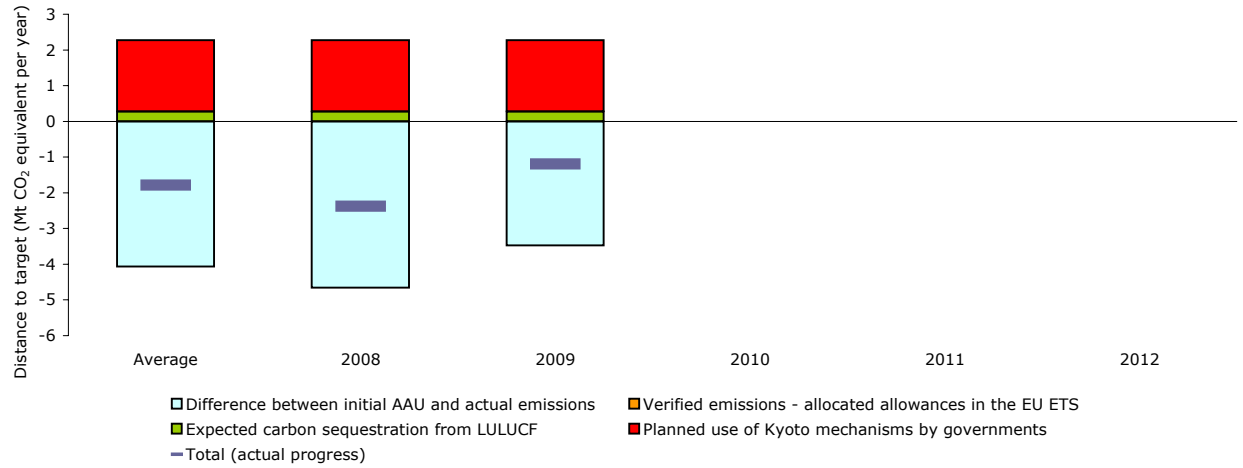
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Average emissions in Switzerland in 2008–2009 were 0.3 % 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 0.5 % of base-year level emissions. Switzerland intends to acquire allowances corresponding to 3.8 % of base-year level emissions per year through the use of flexible mechanisms at government level. Taking all these effects in to account, emissions in Switzerland stand currently above their target level, by a gap representing 3.4 % of the base-year emissions. However, Switzerland estimates that further emission reductions over the period 2010-2012 will close the remaining gap.



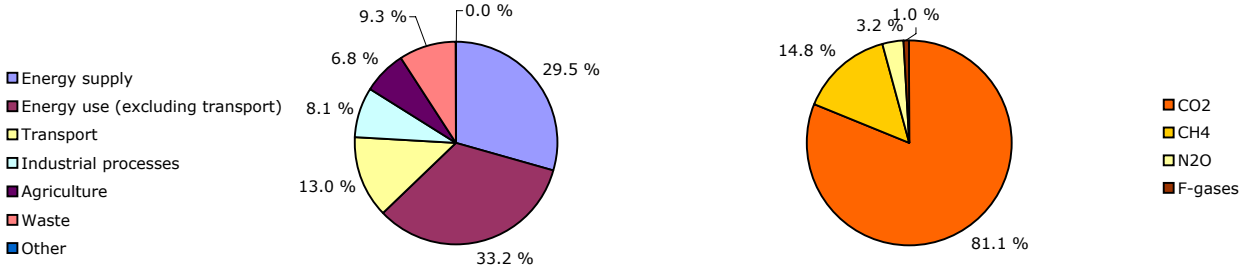
Note: A positive value indicates emissions lower than the average target.

GHG trends and projections in Turkey

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	187.0	380.0	366.5	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG from international bunkers [4]	0.0	0.0	2.4	n.a.	Mt CO_2-eq.	n.a.	n.a.
GHG per capita	3.4	5.5	5.2	n.a.	t CO_2-eq. / capita	n.a.	n.a.
GHG per GDP [5]	925	938	896	n.a.	g CO_2-eq. / euro		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	179.5	96.0 %	– 13.5	– 3.5 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*
GHG per capita	1.8	54.1 %	– 0.3	– 4.8 %	*n.a.*	*n.a.*	*n.a.*	*n.a.*

Assessment of long-term GHG trend (1990–2008)

Emissions have almost doubled since 1990, increasing in all sectors except agriculture. The increase has been 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.

Assessment of short-term GHG trend (2007–2008)

After a long period of increasing emission trend since 2001, emissions decreased significantly in 2008 in all sectors, although the decrease observed in emissions from energy supply was limited. Road transport emissions showed a marked decrease, the first observed since 1998.

Source and additional information

Greenhouse gas emission data and EU ETS data	www.eea.europa.eu/themes/climate/data-viewers
List and description of national policies and measures	www.eea.europa.eu/themes/climate/pam

[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] Preliminary estimates reported by the country for total greenhouse gas emissions. EEA estimates in the case of EU-27, EU-15 and Slovakia.

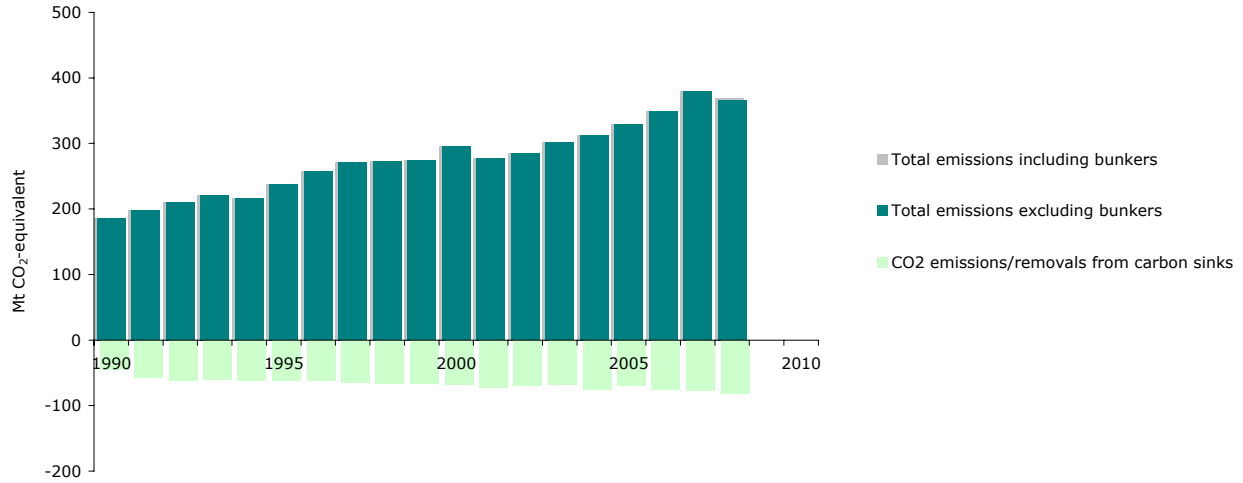
[3] Comparison of 2008 values, 1 = highest value among EU countries.

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

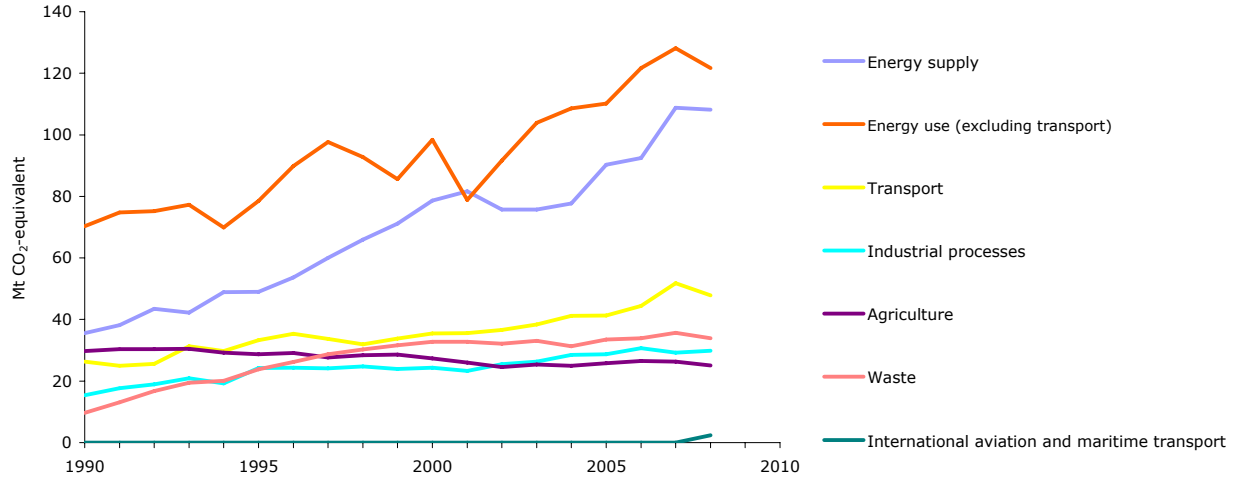
[5] GDP in constant 2000 prices - not suitable for a quantitative comparison between countries for the same year.

[8] LULUCF sector and emissions from international bunkers excluded. Due to independent rounding the sums do not necessarily add up.

GHG trends 1990–2008 - total emissions and removals



GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

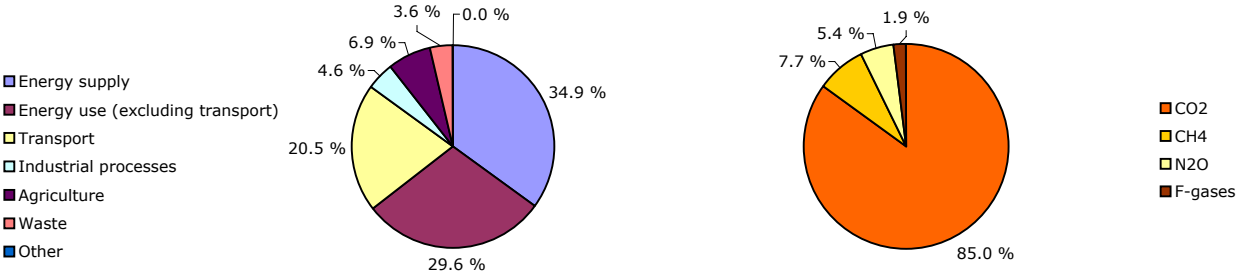
Turkey does not have a target under the Kyoto Protocol.

GHG trends and projections in the United Kingdom

European Environment Agency

Key GHG data [1]	1990	2007	2008	2009 [2]	Unit	Rank in EU-27 [3]	Rank in EU-15 [3]
Total greenhouse gas emissions (GHG)	771.7	640.0	628.2	574.6	Mt CO_2-eq.	2	2
GHG from international bunkers [4]	22.5	42.6	42.0	n.a.	Mt CO_2-eq.	2	2
GHG per capita	13.5	10.5	10.3	9.3	t CO_2-eq. / capita	15	10
GHG per GDP [5]	619	335	327	314	g CO_2-eq. / euro		
Share of GHG in total EU-27 emissions	13.9 %	12.7 %	12.7 %	12.5 %	%		
EU ETS verified emissions [6]		256.6	265.1	231.9	Mt CO_2-eq.	2	2
Share of EU ETS verified emissions in total GHG		40.1 %	42.2 %	40.4 %	%		
ETS verified emissions compared to annual allowances [7]		18.9 %	21.4 %	– 4.2 %	%		

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2008 [1],[8]



Key GHG trends	1990–2008		2007–2008		1990–2009 [2]		2008–2009 [2]	
	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%	Mt CO_2-eq.	%
Total GHG	– 143.5	– 18.6 %	– 11.8	– 1.8 %	– 197.1	– 25.5 %	– 53.6	– 8.5 %
GHG per capita	– 3.2	– 23.9 %	– 0.3	– 2.5 %	– 4.2	– 30.9 %	– 0.9	– 8.5 %
EU ETS verified emissions - all installations			8.5	3.3 %			– 33.1	– 12.5 %
EU ETS verified emissions - constant scope [9]			n.a.	n.a.			– 33.2	– 12.5 %

Assessment of long-term GHG trend (1990–2008)

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, especially after 2001. Emissions from the agriculture sector have decreased by 21 % since 1990, reflecting trends in livestock numbers and reduced fertiliser application. Emissions from the industrial sector have decreased, mostly due to changes in the emissions from the chemical production and metal processing industries. Overall emissions from the waste sector have decreased by 57 % since, mostly due to the implementation of methane recovery systems.

Assessment of short-term GHG trend (2007–2008)

Overall GHG emissions decreased mainly due to declining emissions from public electricity and heat production, industry and road transport. The emission decline from public electricity and heat productions mainly reflects a continued shift in thermal power production from coal to gas: coal consumption in public electricity and heat decreased by 9 % whereas gas consumption increased by 7 %. Emission decreases from industry and transport seem to reflect – to a certain extent – the beginning economic downturn in the United Kingdom. Relevant emission increases are reported from households and services mainly reflecting colder winter months.

Source and additional information

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

List and description of national policies and measures www.eea.europa.eu/themes/climate/pam

[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.

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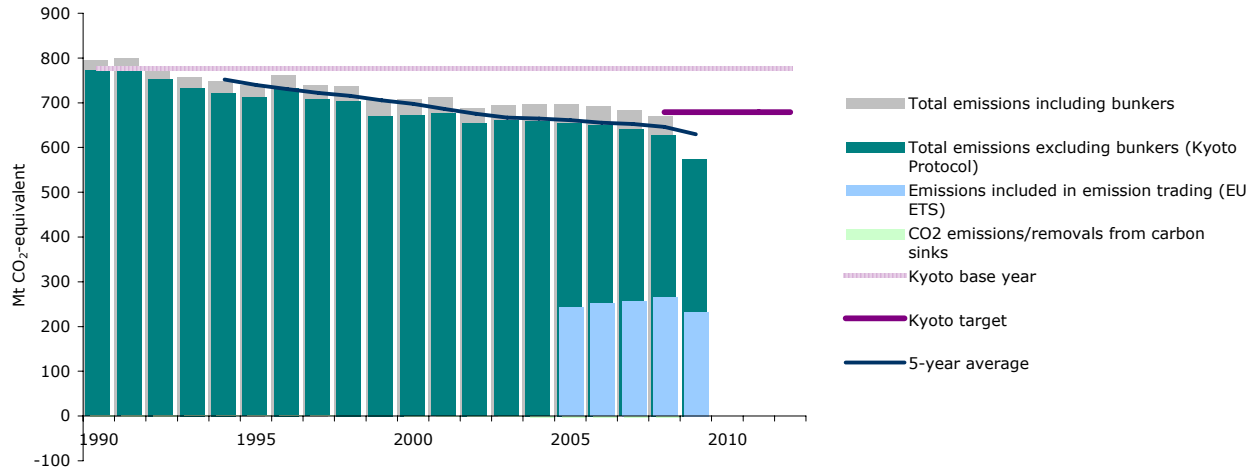
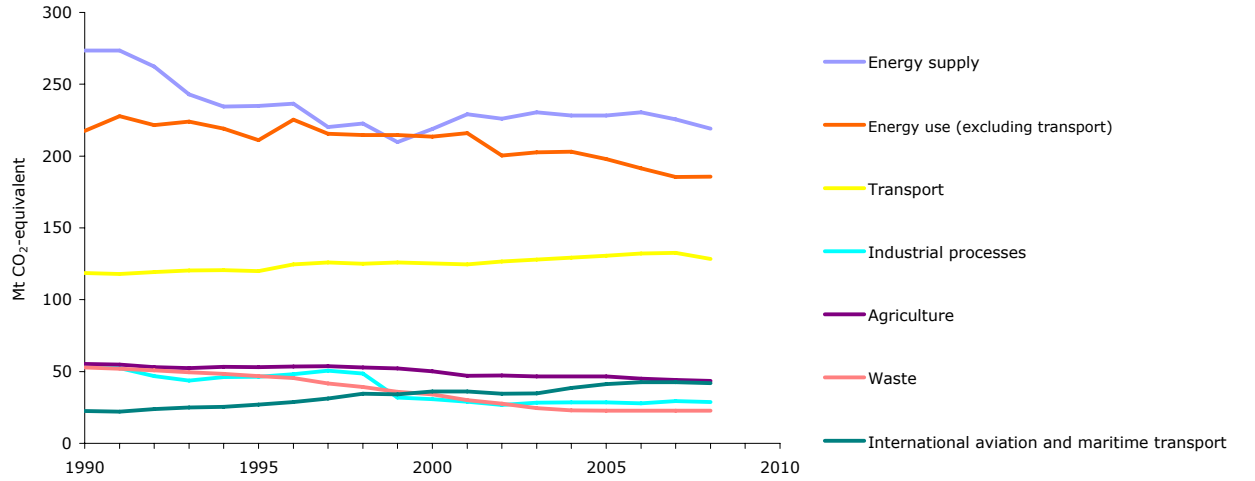
[9] Constant scope: includes only those installations with verified emissions available for the two most recent years (2008 and 2009).

GHG trends 1990–2009 - total emissions and removals



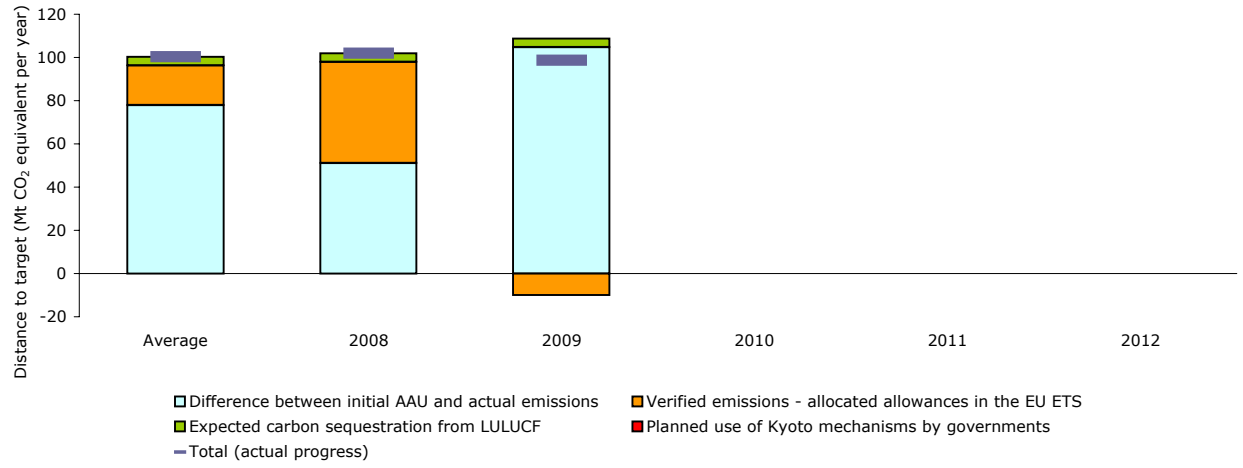
GHG trends 1990–2008 - emissions by sector



Note: updated sectoral projections, taking the effects of the economic crisis, will be presented in 2011

Progress towards Kyoto target

Average emissions in United Kingdom in 2008–2009 were 22.5 % lower than the base-year level, well below the Kyoto target of -12.5 % for the period 2008–2012. Operators of installations covered by the EU ETS had to surrender more allowances than were issued to the EU ETS, increasing the countries assigned amount by 2.4 % of base-year level emissions. LULUCF activities are expected to decrease net emissions by 0.5 % of base-year level emissions. Taking all these effects in to account, emissions in the sectors not covered by the EU ETS in United Kingdom stand currently below their target level, by a gap representing 12.9 % of the base-year emissions.



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

European Environment Agency

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