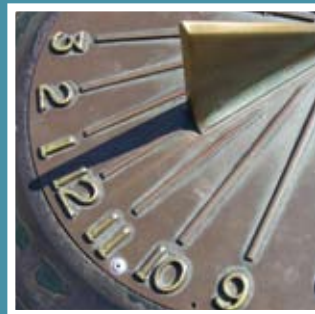


Greenhouse gas emission trends and projections in Europe 2006

ISSN 1725-9177



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Luxembourg: Office for Official Publications of the European Communities, 2006

ISBN 92-9167-885-6
ISSN 1725-9177

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Contents

Acknowledgements	4
Summary.....	5
1 Introduction	10
2 The Kyoto Protocol targets	11
3 Greenhouse gas emissions in EU-25	14
4 Greenhouse gas emissions in EU-15 Member States	17
5 Greenhouse gas emissions in new EU Member States.....	23
6 Greenhouse gas emissions in EU acceding countries and other EEA member countries	27
7 Use of Kyoto mechanisms.....	30
8 The European Union emissions trading scheme	32
9 Effects of domestic sectoral policies and measures in the EU	34
9.1 Overview of national and common EU policies and measures	34
9.2 Sectoral EU-15 (32) emission trends and projections	37
10 Use of carbon sinks	53
11 The reporting scheme.....	54
12 Glossary	55
Annexes: Additional information on GHG trends and projections by sector and by Member States.....	57
A1: Use of flexible mechanisms under the Kyoto Protocol, joint implementation, clean development mechanism and international emission trading in EU-15 Member States	
A2: Key domestic policies and measures, their state of implementation and their main savings	
A3: Sectoral emission trends and projections in the EU-15	
A4: Accounting of carbon sinks by EU Member States	
A5: The reporting schemes	
A6: Information sources for national projections	
A7: Summary of EU-25 greenhouse gas emission trends and projections	
A8: Indicators on actual and projected greenhouse gas emissions for each individual EU Member State	
A9: Information on national policies and measures as well as projections for each individual EU Member State	
Only annexes A6 and A7 are available in printed form, all other annexes are published on the EEA website (www.eea.europa.eu).	

Acknowledgements

This report was prepared by the EEA and the European Environment Agency's European Topic Centre for Air and Climate Change (ETC/ACC) provided input to this report. The coordination of input from the ETC was provided by Gunnar Luderer of Umweltbundesamt, Germany.

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EEA acknowledges the comments received on the draft report from the national focal points of EEA member countries and the European Commission (DG Environment). These comments have been included in the final version of the report as far as practically feasible.

Summary

This report contains a compilation and analysis of past and projected greenhouse gas emissions from EU Member States and other EEA member countries. It is based on data and related information provided by these countries before 6 June 2006.

Total EU greenhouse gas emissions and projections

Total EU 23 ⁽¹⁾ greenhouse gas emissions rose slightly in 2004 by 0.3 % compared to 2003 and were 5 % below 1990 level. With existing policies and measures, EU-23 greenhouse gas emissions are projected to be 2.1 % below 1990 level by 2010. With additional policies and measures greenhouse gas emissions are projected to be 5.6 % below 1990 level (and slightly below 2004 level).

Greenhouse gas emissions in the pre-2004 EU Member States (EU-15) in 2004 were 0.9 % below base-year level ⁽²⁾. This means the EU-15 was little more than a tenth of the way towards achieving the 8 % emissions reduction from base-year level required by 2008–2012 under the Kyoto Protocol ⁽³⁾. Latest projections for 2010 show that the combined effect of existing and additional domestic policies

and measures, Kyoto mechanisms ⁽⁴⁾ and 'carbon sinks' ⁽⁵⁾ would bring emissions down to 8.0 % below the EU-15 base-year level. This corresponds exactly to the reduction required under the Kyoto Protocol (see Figure 0.1).

With existing domestic ⁽⁶⁾ policies and measures, total EU-15 greenhouse gas emissions will only be 0.6 % below base-year levels in 2010 ⁽⁷⁾. Taking into account additional domestic policies and measures being planned by Member States, a total EU-15 emissions reduction of 4.6 % is projected. This relies on the assumption that several Member States will cut emissions by more than is required to meet their national targets. The projected use of Kyoto mechanisms by ten Member States ⁽⁸⁾ will reduce emissions by 2010 by a further 2.6 %. Finally, the use of carbon sinks according to Articles 3.3 and 3.4 of the Kyoto Protocol would contribute an additional 0.8 %.

Progress of EU-15 Member States

Sweden and the United Kingdom project that existing domestic policies and measures will be sufficient to meet their burden-sharing targets and

-
- ⁽¹⁾ Not all EU-25 Member States have targets for GHG emission reductions under the Kyoto Protocol or under the EU-15 burden sharing agreement (Malta and Cyprus have no targets).
- ⁽²⁾ Base-year level of greenhouse gas emissions for the EU-15 is calculated by using 1990 emissions for carbon dioxide, methane and nitrous oxide for all Member States, and 1995 emissions for fluorinated gases for all Member States except Finland and France that selected 1990 as base-year for these gases.
- ⁽³⁾ The pre-2004 Member States are covered by the 'EU burden-sharing' agreement which lays down differentiated emission limitations for each of these 15 Member States, with the aim of ensuring that the EU-15 meets its overall 8 % reduction commitment under the Protocol. Therefore, this report provides the most detailed information on the pre-2004 EU-15 Member States. The new EU Member States keep their individual targets under the Kyoto Protocol (see Chapter 2 of this report). The commitment period 2008–2012 is referred to as the year 2010 in this report.
- ⁽⁴⁾ Joint implementation, clean development mechanism and emissions trading according to the Kyoto Protocol, Art. 6, Art. 12, and Art. 17. These mechanisms allow industrialised countries with emissions limitation and reduction commitments to invest in emissions-savings projects in other countries and use the resulting emission credits to help meet their Kyoto targets. (See also Chapter 7 of this report.)
- ⁽⁵⁾ According to Articles 3.3 and 3.4 of the Kyoto Protocol, Parties to the Protocol can make use of CO₂ removals by land use change and forestry activities, i.e. carbon sinks, to achieve their targets.
- ⁽⁶⁾ Domestic policies and measures are those taking place within the national boundaries. Existing policies and measures are those for which one or more of the following applies: (a) national legislation is in force; (b) one or more voluntary agreements have been established; (c) financial resources have been allocated; (d) human resources have been mobilised; (e) an official government decision has been made and there is a clear commitment to proceed with implementation. Additional (planned) policies and measures are options under discussion with a realistic chance of being adopted and implemented in time to influence the emissions during the commitment period.
- ⁽⁷⁾ Without existing policies and measures, total EU-15 greenhouse gas emissions would have been higher than the base-year level. The total effect of the existing policies and measures compared to a theoretical reference scenario without any measures since 1990 would be greater than the 0.6 % reduction referred to here.
- ⁽⁸⁾ Austria, Belgium, Denmark, Finland, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain.

they may even over-deliver. Sweden expects net removals from carbon sinks.

Finland and the Netherlands project that they will meet their target with a combination of additional policies and measures, and emission allowances from the use of Kyoto mechanisms. Luxembourg has not reported on additional measures, but projects it will also reach its target with the use of Kyoto mechanisms.

Germany and Greece project that they will reach their targets if currently planned additional policies and measures are implemented. France projects that it will reach its target with a combination of additional measures and the use of carbon sinks.

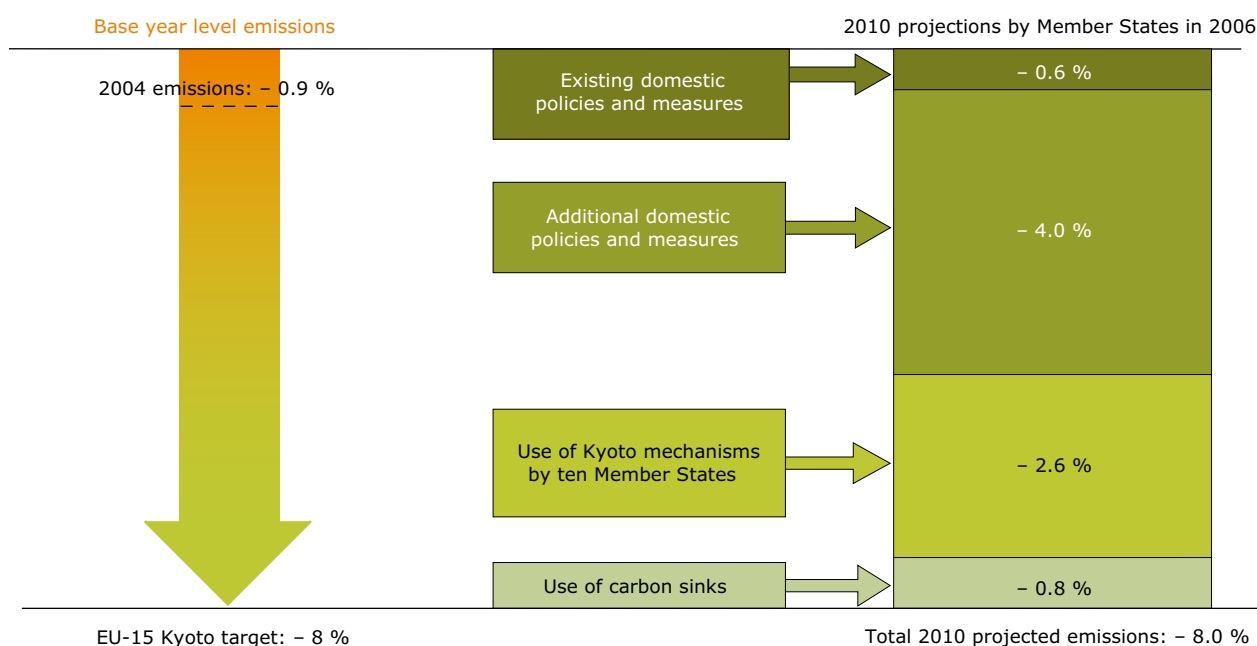
Seven countries (Italy, Belgium, Portugal, Ireland, Austria, Denmark and Spain) of the EU-15 project that they will miss their target with the currently planned additional domestic policies and measures

and/or use of Kyoto mechanisms and/or carbon sink activities.

Ten countries ⁽⁹⁾ have allocated financial resources for using the Kyoto mechanisms with a total amount of about EUR 2 830 million for the whole 5-year Kyoto Protocol commitment period (2008–2012). These ten countries, France and Portugal have started to prepare legal and operational frameworks and bilateral agreements for using the Kyoto mechanisms.

Since Member States have to submit information about their activities under Articles 3.3 and 3.4 of the Kyoto Protocol along with their assigned amount reports ⁽¹⁰⁾, the available data on the use of carbon sinks towards the burden sharing targets has improved substantially since last year's report. For the EU-15, the total net emissions removal from activities under Articles 3.3 and 3.4 are projected to amount to 32.6 million tonnes per

Figure 0.1 Summary of EU-15 projections of greenhouse gas emissions reductions by 2010



Note: Without existing policies and measures, total EU-15 greenhouse gas emissions would have been higher than the base-year level. The total effect of the existing policies and measures compared to a theoretical reference scenario without any measures since 1990 would be greater than the 0.6 % reduction referred to here.

Source: EEA, based on EU-15 Member States projections.

⁽⁹⁾ Austria, Belgium, Denmark, Finland, Germany, Ireland, Italy, the Netherlands, Spain and Sweden. Although they have decided to use Kyoto mechanisms, Luxembourg and Portugal are not included in this list as they did not provide quantified information on the financial budgets. Finland intends to use Kyoto mechanisms to reach its target but has not yet decided on the total quantity of units to be bought. The funds provided by Finland, Germany, and Sweden are for pilot programmes. Germany does not intend to use Kyoto mechanisms for reaching its target; Sweden has not yet taken a final decision.

⁽¹⁰⁾ The EU and each Member State must each submit by 31 December 2006 a report to the UNFCCC Secretariat determining their assigned amount (maximum limit of greenhouse gases which a Party may emit over the first commitment period of the Kyoto Protocol for the period 2008–2012).

year. This contribution is relatively small, yet it is important since the EU-15 would fail to reach its 8 % reduction target without accounting for carbon sinks.

EU-15 sectoral emission trends, projections and policies

From 1990 to 2004, EU-15 greenhouse gas emissions decreased from most sectors, particularly energy supply, industry, agriculture and waste management. During the same period, however, emissions from transport increased by nearly 26 %. With the help of additional measures, emissions from energy supply, agriculture and waste management are projected to further decrease, while emissions from transport and industrial processes will both roughly stabilise at 2004 levels.

Domestic policies and measures in EU-15 Member States that are projected to contribute most to achieving the targets include the EU emissions trading scheme. By June 2005, the European Commission had accepted all 25 national allocation plans (NAPs) for the first period (2005–2007). These plans correspond to more than 10 500 installations. Verified data for 2005 emissions were published by the European Commission in May 2006. The second national allocation plans for the Kyoto Protocol period (2008–2012) were due to be submitted to the European Commission by 30 June 2006, and were not taken into account in this report.

Other key policies and measures include promotion of electricity from renewable energy, promotion of combined heat and power (CHP), improvements in energy performance of buildings and energy efficiency in large industrial installations, and promotion of the use of energy-efficient appliances. However, current trends suggest that the EU-25 renewable electricity target (21 % of gross electricity consumption by 2010) is unlikely to be met. Also the promotion of biofuels in transport and reduction

of the average carbon dioxide emissions of new passenger cars, recovery of gases from landfills and reduction of fluorinated gases are all key policies and measures.

Progress of new EU Member States and other EEA member countries

Greenhouse gas emissions have declined substantially in almost all new Member States. In 2004, emissions were 23 % below 1990 level. This is mainly due to the introduction of market economies and the consequent restructuring or closure of heavily polluting and energy-intensive industries. Greenhouse gas emissions from transport decreased by 5 % between 1990 and 1995 but increased after 1995. In 2004 they exceeded 1990 levels by 28 %.

Seven new Member States project that they will meet or even over-achieve their Kyoto targets by 2010 with existing domestic policies and measures. However, in most countries emissions will increase between 2004 and 2010. Slovenia projects that it will meet its Kyoto target with additional policies and measures, and CO₂ removals from land-use change and forestry. Cyprus and Malta do not have a target under the Kyoto Protocol.

EU acceding countries and Iceland were on track to meet or even over-achieve their Kyoto targets. Bulgaria and Romania will further over-achieve their targets using additional policies and measures. In 2004, Norway and Liechtenstein were not on track to meet their Kyoto targets and project that they will only meet these targets by using Kyoto mechanisms in addition to existing policies and measures. Quantified projections accounting for additional measures were not available for Liechtenstein. Switzerland projects to reach its target with additional measures and the use of Kyoto mechanisms. Turkey and Croatia have ratified the United Nations framework convention on climate change (UNFCCC), but not the Kyoto Protocol.

Table 0.1 Summary of planned measures and progress to targets (by country)

Country	EU burden sharing or Kyoto target	Measures with quantified 2010 reductions projections				Kyoto target projected to be reached?
		Existing policies and measures	Additional policies and measures	Use of Kyoto mechanisms	Net removal from carbon sinks ⁽¹¹⁾	
EU-15	- 8.0 %	X	X	X	X	Yes
EU-15 Member States						
Austria	- 13.0 %	X	X	X	X	No
Belgium	- 7.5 %	X	X	X		No
Denmark	- 21.0 %	X	NA	X	X	No
Finland	0 %	X	X	X		Yes
France	0 %	X	X		X	Yes
Germany	- 21.0 %	X	X			Yes
Greece	+ 25.0 %	X	X			Yes
Ireland	+ 13.0 %	X	NA	X	X	No
Italy	- 6.5 %	X	X	X	X	No
Luxembourg	- 28.0 %	X		X		Yes
Netherlands	- 6.0 %	X	X	X	X	Yes
Portugal	+ 27.0 %	X	X	X	X	No
Spain	+ 15.0 %	X	NA	X	X	No
Sweden	+ 4.0 %	X			X	Yes
United Kingdom	- 12.5 %	X	X		X	Yes
New Member States						
Czech Republic	- 8.0 %	X	X		X	Yes
Cyprus	NR	NR	NR	NR	NR	NR
Estonia	- 8.0 %	X	X			Yes
Hungary	- 6.0 %	X	X			Yes
Latvia	- 8.0 %	X	X			Yes
Lithuania	- 8.0 %	X				Yes
Malta	NR	NR	NR	NR	NR	NR
Poland	- 6.0 %	X				Yes
Slovenia	- 8.0 %	X	X		X	Yes
Slovakia	- 8.0 %	X	X			Yes
Acceding countries ⁽¹²⁾						
Bulgaria	- 8.0 %	X	X			Yes
Romania	- 8.0 %	X	X			Yes
Croatia	- 5.0 %	NA	NA			NA
Turkey	NR	NR	NR			NR
Other EEA member countries						
Iceland	+ 10.0%	X	NA			Yes
Liechtenstein	- 8.0 %	X	NA			No
Norway	+ 1.0 %	X	X			No
Switzerland	- 8.0 %	X	X			Yes

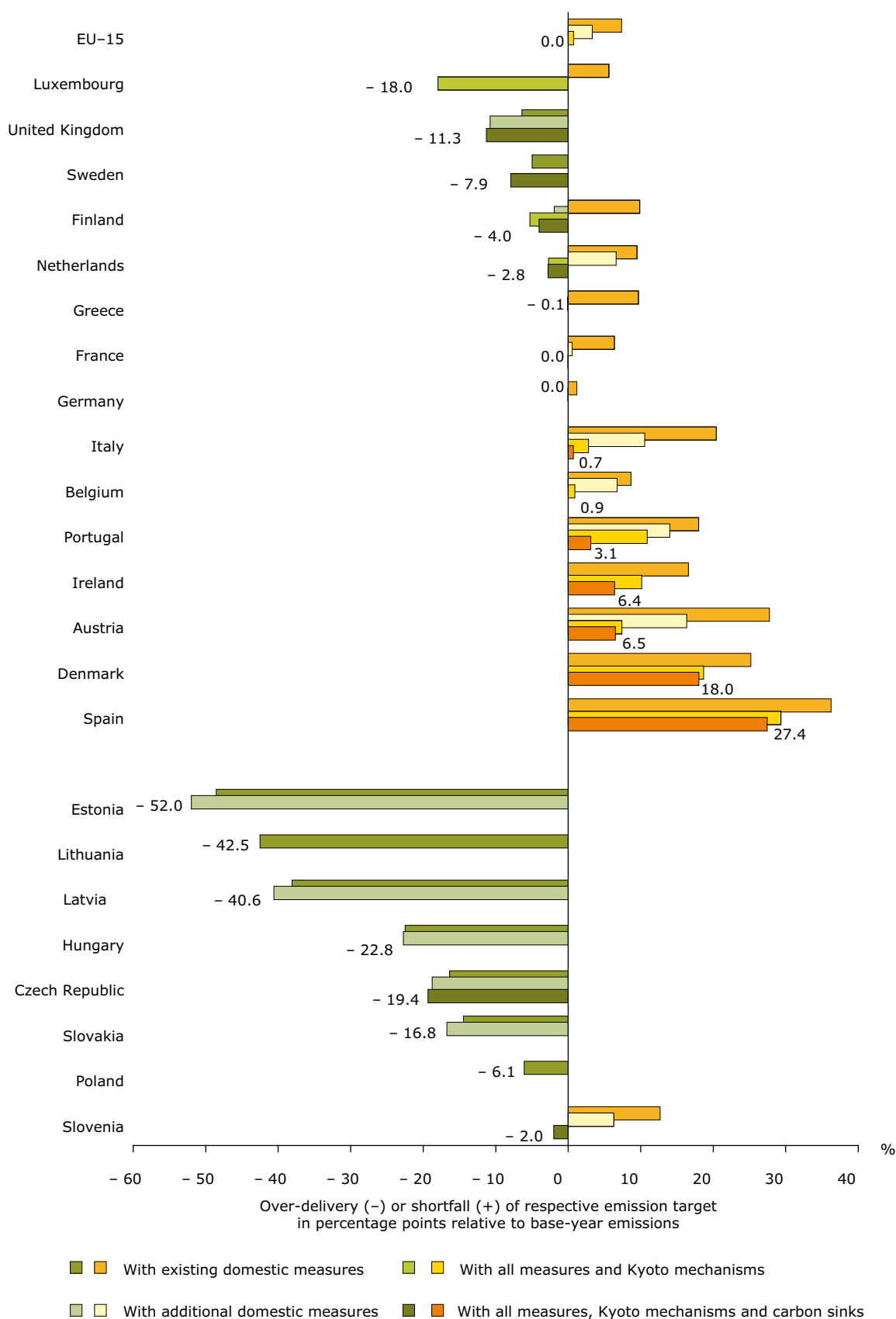
Note: X — reported; NA — no information was available; NR — not relevant since no Kyoto target

Source: EEA, based on EU-15 Member States projections.

⁽¹¹⁾ Activities under Articles 3.3 and 3.4 of the Kyoto Protocol.

⁽¹²⁾ Since questionnaire-based surveys on the use of Kyoto mechanisms and carbon sinks were only conducted for EU Member States, these activities were not considered in this analysis for EU acceding countries and other EEA member countries (therefore the table is partly shaded).

Figure 0.2 Relative gaps between EU Kyoto and burden sharing targets and projections for 2010 including existing and additional measures, use of Kyoto mechanisms (KM) and use of carbon sinks for EU Member States



1 Introduction

This report presents an assessment of the actual historic (1990 to 2004) and projected progress (by 2010) of the European Community (EC), its Member States, acceding countries as well as other EEA member countries towards achieving the objectives of the UN Framework Convention on Climate Change (UNFCCC) and their emission targets under the Kyoto Protocol ⁽¹³⁾.

The report also serves to support and complement the annual evaluation report of the European Commission to the Council and European Parliament, which is required under Council Decision 2004/280/EC concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol.

In this report, the assessment of whether Member States are on track to reach their targets is based mainly on an analysis of domestic policies and measures. The use by Member States of the flexible mechanisms of the Kyoto Protocol to fulfil their commitments is also included. This year for the first time, activities concerning land use, land-use change and forestry ('carbon sinks') are included. This assessment contains information on all 25 EU Member States, but is most detailed for the 15 pre-2004 Member States (EU-15). These are covered by the 'EU burden-sharing

agreement' which lays down differentiated emission commitments for each of the 15 Member States. This agreement aims to ensure that the EU-15 meets its overall reduction commitment under the Protocol.

This year (2006) the EEA report on greenhouse gas emission trends and projections is published for the fifth time. Since there was no submission due under the EU monitoring mechanism in 2006, the data presented here are mostly based on the 4th National Communications submitted by the countries to the UNFCCC. Data available until 6 June 2006 were included. Therefore, the second national allocation plans (NAPs), which were due to be submitted to the European Commission by 30 June 2006, were not taken into account. Except for Cyprus and Malta, all Member States provided updates on emission inventories. More details on the 1990–2004 emission data are available in the EEA technical report No 6/2006: *Annual European Community greenhouse gas inventory 1990–2004 and inventory report 2006 – Submission to the UNFCCC Secretariat*. Updated emission projections or national programmes were provided by twelve of the EU-15 Member States and six of the new Member States. Detailed information on national greenhouse gas emission trends, projections, policies and measures, and methodologies (including the references) is presented in the annexes.

⁽¹³⁾ This report covers the EU Member States, EU acceding countries (Bulgaria, Croatia and Romania) and the additional EEA member countries Norway, Iceland, Liechtenstein and Switzerland. The report covers Turkey only partially due to lack of data and because it does not have a target under the Kyoto Protocol. Also Malta and Cyprus do not have targets under the Kyoto Protocol, but the limited available data are presented.

2 The Kyoto Protocol targets



The EU, its Member States, the acceding countries of Romania and Bulgaria, and most of the additional EEA member countries have ratified the Kyoto Protocol.



Turkey and Croatia have ratified the UNFCCC, but not the Kyoto Protocol.

As of July 2006, 164 countries have ratified, accepted, approved or acceded⁽¹⁴⁾ to the Kyoto Protocol. This includes 34 Annex I countries⁽¹⁵⁾ who accounted for 61.6 % of all Annex I carbon dioxide emissions in 1990. The Kyoto Protocol entered into force on February 16th 2005 following ratification by Russia⁽¹⁶⁾.

Combating climate change and minimising its potential consequences by achieving stabilisation of atmospheric greenhouse gas concentrations and thus avoiding dangerous interference with the climate system is a key objective of the UN Framework Convention on Climate Change (UNFCCC) and a high priority for the EU.

This requires substantial reductions in global greenhouse gas emissions. As a first step, Parties to the UNFCCC in 1997 adopted the Kyoto Protocol. The commitment in the protocol for developed countries as a whole would have reduced their emissions of a basket of six greenhouse gases to 5.2 % below their levels in a given base-year (1990 in most cases) by the period 2008–2012. Since not all developed countries have ratified the Protocol, the total reduction target is lower. The target is about 1.7 % below base-year emissions for all developed countries as a whole⁽¹⁷⁾. This means that it is about 2.8 % below the 1990 emissions of those countries that have ratified the Protocol⁽¹⁸⁾.

For the EU-15 the Kyoto Protocol sets the target of an 8 % emissions reduction from the base-year level by the 2008–2012 commitment period. Within this overall target, differentiated emission limitation or reduction targets have been agreed for each of the pre-2004 Member States under an EU accord known as the 'burden-sharing agreement' (Figure 2.1).

The new Member States have individual targets under the Kyoto Protocol. The Czech Republic, Estonia, Latvia, Lithuania, Slovakia and Slovenia have reduction targets of 8 % from the base-year, while Hungary and Poland have reduction targets of 6 %. Cyprus and Malta have no Kyoto target (Figure 2.2).

The acceding countries Bulgaria and Romania have reduction targets of 8 %. Croatia, which started accession negotiations with the EU in 2005, has a reduction target of 5 %. However, it has not yet ratified the Kyoto Protocol. Turkey is a Party to the UNFCCC, but not to the Kyoto Protocol. Therefore, it has no reduction target.

The additional EEA member countries, Norway and Iceland are allowed to increase emissions under the Kyoto Protocol, by 1 % and 10 % respectively, from their base-year emissions. Switzerland and Liechtenstein have reduction targets of 8 % (Figure 2.3).

⁽¹⁴⁾ Acceptance, approval and accession have the same legal effect as ratification.

⁽¹⁵⁾ Annex I countries are the countries with developed economies which have committed themselves to adopting national policies and taking measures on the mitigation of climate change, by limiting their anthropogenic emissions of greenhouse gases and protecting and enhancing their greenhouse gas sinks and reservoirs, under the Convention on Climate Change. The convention entered into force on 21 March 1994. Annex I countries which ratified the Kyoto Protocol have their reduction targets formally stated in the Kyoto Protocol (adopted in 1997).

⁽¹⁶⁾ Russia's ratification was necessary as at least 55 % of the emissions from Annex I countries had to be represented.

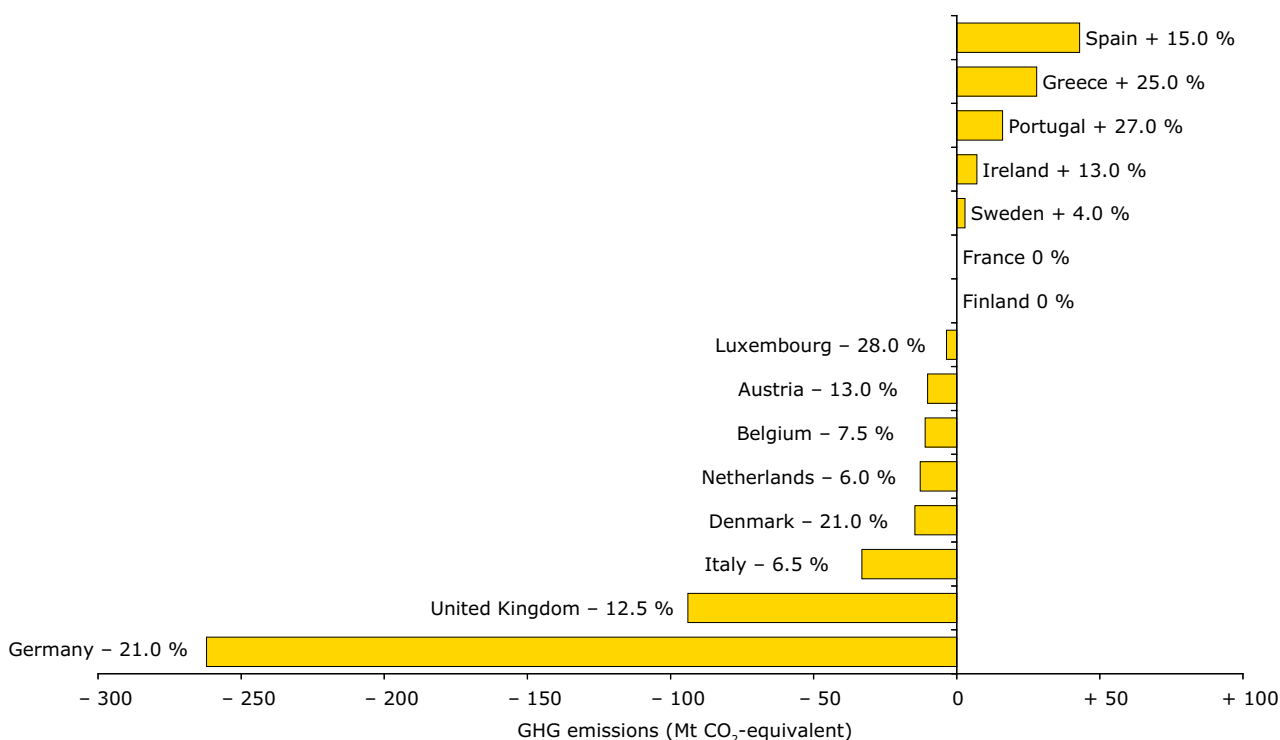
⁽¹⁷⁾ Not all countries use 1990 as the base-year.

⁽¹⁸⁾ EEA Report No 1/2005: *Climate change and a European low-carbon energy system*.

According to Article 3.7 of the Kyoto Protocol, Parties that had net emissions from the land use, land-use change and forestry sector in their base-year can include this amount in their assigned amounts. Hence, this reduces the requirements for reaching the

target. Out of the EU-15, this rule applies to Portugal, the United Kingdom and the Netherlands. This effect was accounted for in the report, but only results in minor adjustments in the gap and distance to target assessments (Chapters 4–6).

Figure 2.1 Greenhouse gas emission targets of EU-15 Member States for 2008–2012 relative to base-year emissions under the EU burden-sharing decision ⁽¹⁹⁾

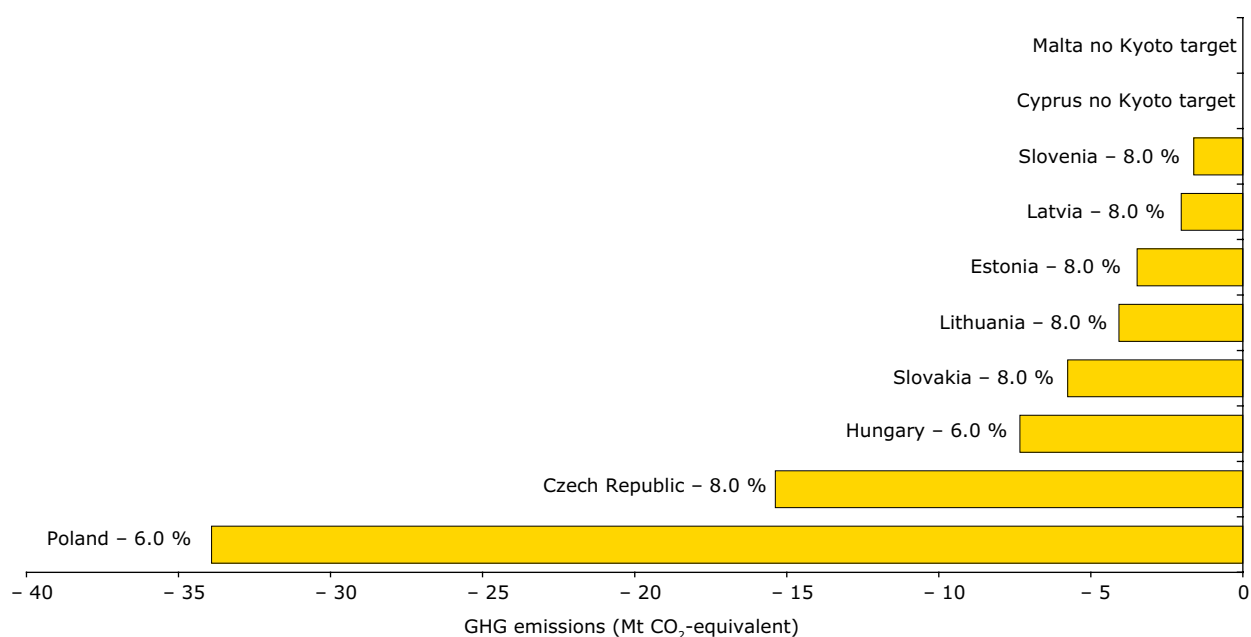


Note: The base-year is 1990 for all EU-15 Member States for CO₂, methane (CH₄) and nitrous oxide (N₂O). 1995 is used for fluorinated gases, with the exception of France and Finland where 1990 is used.

Source: EEA.

⁽¹⁹⁾ In the Council decision (2002/358/EC) on the approval by the EU of the Kyoto Protocol, the various commitments of the Member States are expressed as percentage changes from the base-year. In 2006 the respective emission levels will be determined in terms of tonnes of CO₂-equivalent and reported separately. In this connection, 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.

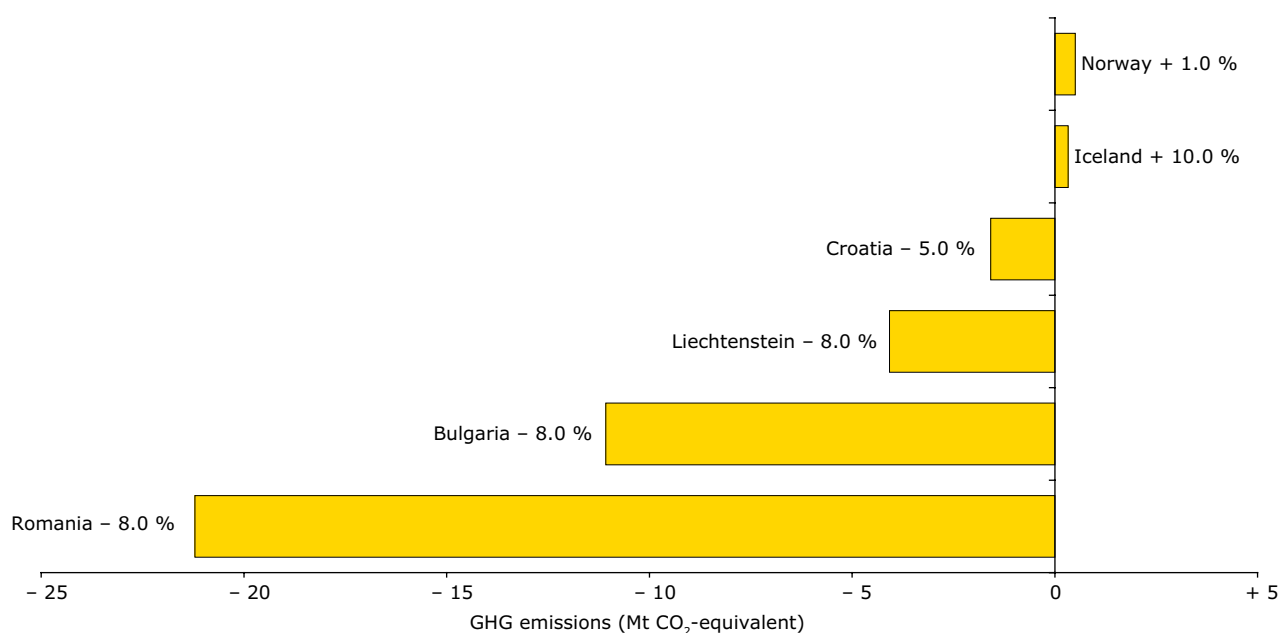
Figure 2.2 Greenhouse gas emission targets of new EU Member States for 2008–2012 relative to base-year emissions under the Kyoto Protocol



Note: Countries with base-years other than 1990 are Hungary (average 1985–1987), Poland (1988) and Slovenia (1986). Cyprus and Malta have no targets.

Source: EEA.

Figure 2.3 Greenhouse gas emission targets of EU acceding and other EEA countries for 2008–2012 relative to base-year emissions under the Kyoto Protocol



Note: Countries with base-years other than 1990 are Bulgaria (1988) and Romania (1989). Turkey is a Party to the UNFCCC, but not to the Kyoto Protocol and therefore has no reduction target. Croatia signed but did not ratify the Kyoto Protocol.

Source: EEA.

3 Greenhouse gas emissions in EU-25



With existing policies and measures, EU-23 greenhouse gas emissions are projected to be about 2 % below 1990 level by 2010. With additional policies and measures greenhouse gas emissions are projected to stabilise at 2002 level (approximately 6 % below 1990 level).

Total EU-23 ⁽²⁰⁾ greenhouse gas emissions rose slightly in 2004 by approximately 0.4 % compared to 2003 and were 5 % below 1990 level (Figure 3.1). The emissions rose for the second consecutive year and are now at the highest level since 1997. The new Member States' share of the total 2004 emissions was 15 %.

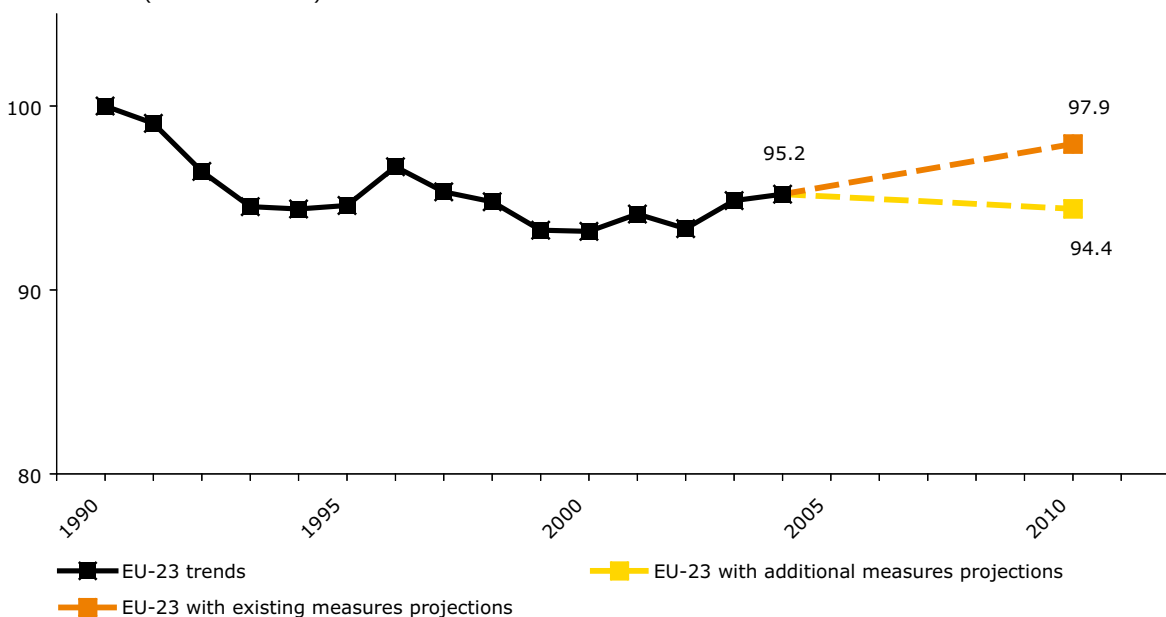
By 2010, total EU-23 greenhouse gas emissions are projected to be approximately 2 % below 1990 level. This projection is based on Member States' own estimates which take into account all existing

domestic policies and measures. The projected decline is 5.6 % with additional domestic policies and measures. Emissions would increase between 2004 and 2010 without additional domestic policies and measures.

The greenhouse gas emissions per capita of the EU Member States exhibit significant variability. There is approximately a factor of three between the Member States with lowest per capita emissions (Latvia, Lithuania, Portugal and Sweden) and those with highest per capita emissions (Luxembourg,

Figure 3.1 Greenhouse gas emission trends and projections for EU-23

GHG emissions (1990 level = 100)



Note: Data exclude emissions and removals from land-use change and forestry. Cyprus and Malta are not included due to lack of data and because they do not have targets under the Kyoto Protocol.

Source: EEA, based on EU Member States greenhouse gas inventories and projections.

⁽²⁰⁾ As indicated in Chapter 2, not all EU-25 Member States have targets for GHG emission reductions under the Kyoto Protocol (Malta and Cyprus have no targets). Therefore this chapter mainly analyses EU-23 (excluding Malta and Cyprus).

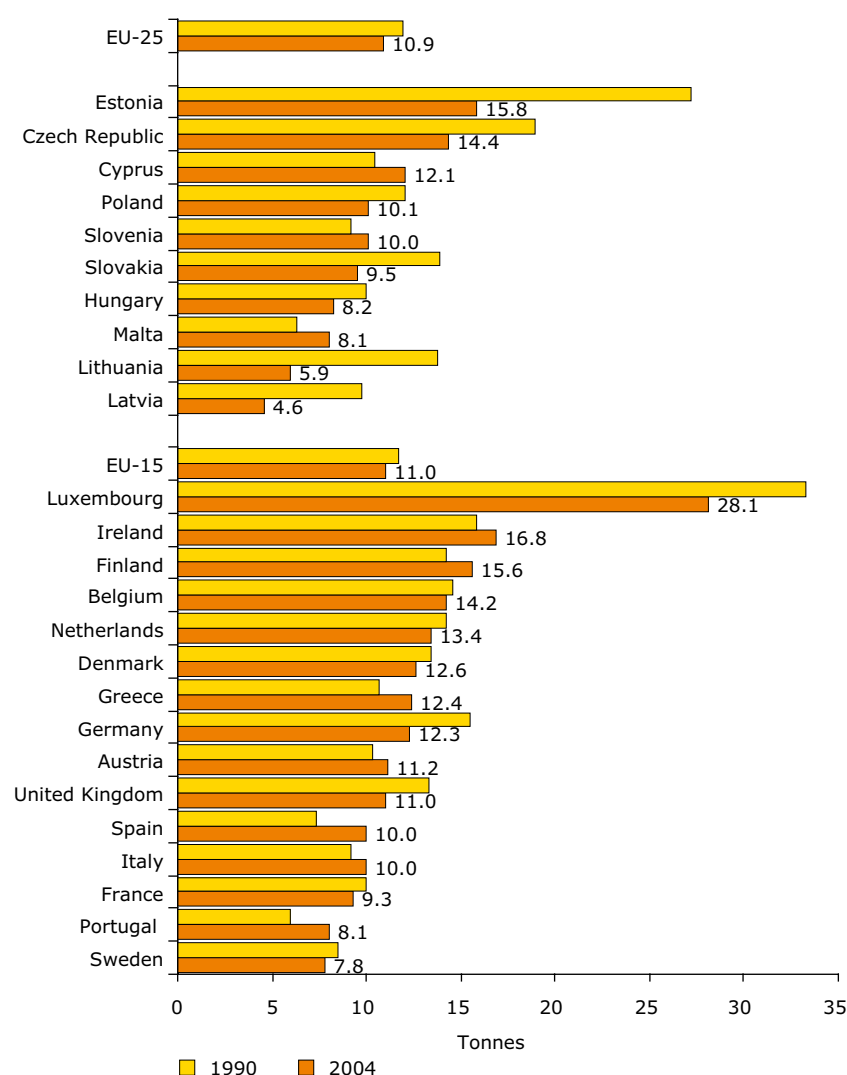
Ireland, Finland and Estonia). At 10.1 tonnes per year, the new EU Member States have somewhat lower per capita emissions on average than the EU-15 (11.0 tonnes per year).

In the EU-25, the annual greenhouse gas emissions per capita decreased by 1 tonne from 1990 to 2004, corresponding to a decline of 9 %. In the EU-15, the decrease was approximately 6 %, largely due to reductions in Germany and the United Kingdom. All of the new Member States, except Cyprus, Malta and Slovenia decreased per capita emissions substantially in the 1990s (Figure 3.2).

Greenhouse gas emissions per GDP in the EU-25 decreased by 18 % from 1995–2004 (Figure 3.3). For the EU-15, they decreased by 17 % during

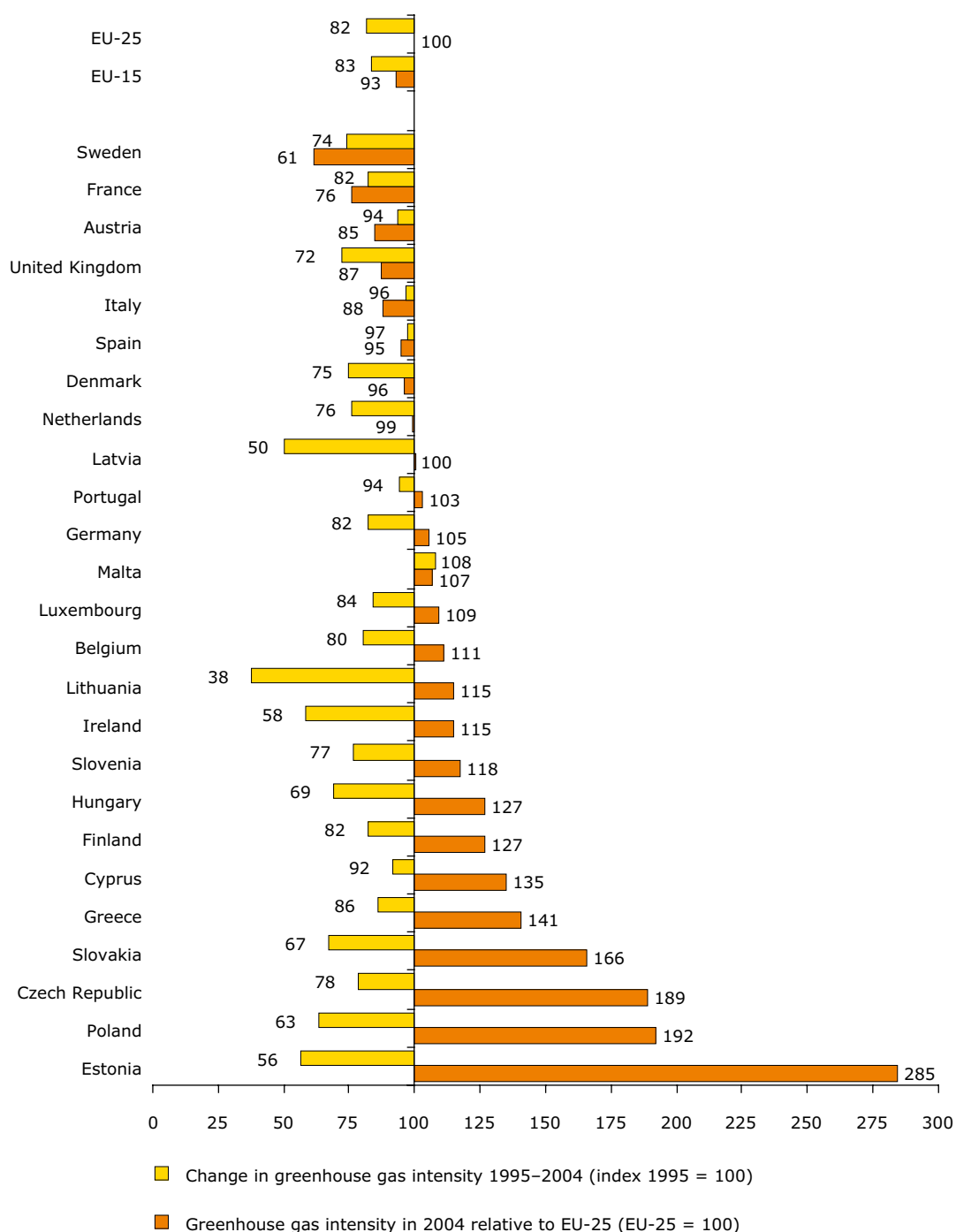
this period. All Member States except for Malta decreased greenhouse gas intensity. This continuous decline indicates some decoupling of greenhouse gas emissions and economic growth. The decrease in greenhouse gas intensity was most pronounced in the new Member States, most notably in Lithuania (– 62 %), Latvia (– 50 %) and Estonia (– 44 %). Of the EU-15, Ireland (– 42 %), the United Kingdom (– 28 %), Sweden (– 26 %) and Denmark (– 25 %) were most successful in decoupling their greenhouse gas emissions from economic growth. Despite the substantial decreases, greenhouse gas intensities of the new Member States (with the exception of Latvia) remain well above the EU average. This indicates some potential in these countries for economic growth with further declining greenhouse gas emissions.

Figure 3.2 Greenhouse gas emissions per capita of EU-25 Member States for 1990 and 2004



Source: EEA, based on EU Member States greenhouse gas inventories; Eurostat.

Figure 3.3 Greenhouse gas emissions per GDP of EU-25 Member States: comparison with EU-25 average in 2004 and change since 1995 (index 1995 = 100)








Note: The analysis of the change in greenhouse gas intensity was based on GDP data at constant prices (1995 level). The intra-EU analysis of greenhouse gas intensity in 2004 was performed using GDP data in purchasing power standards in order to allow for a meaningful comparison between countries with different price levels.

Source: EEA, based on EU Member States greenhouse gas inventories; Eurostat.

4 Greenhouse gas emissions in EU-15 Member States

EU-15 assessment

-  Greenhouse gases emissions in the EU-15 have risen since 1999 and emission levels in 2004 were the highest since 1996.
-  In 2004, greenhouse gas emissions for the EU-15 were 0.9 % below the base-year level. This means that the EU-15 is little more than one tenth of the way towards its 8% reduction target under the Kyoto Protocol.
-  Compared to last year's analysis, emission reductions in the EU-15 projected for 2010 have become significantly smaller. This is due to changes in both the base-year emission data and in the emission projections of several Member States.
-  Enhanced efforts on top of existing domestic policies and measures, including additional domestic measures along with the use of Kyoto mechanisms and carbon sinks, are projected to amount to a combined emission reduction of 8.0 % below base-year level. These policies and measures would just be sufficient to reach the EU-15 Kyoto target (existing domestic policies and measures are projected to deliver 0.6 % ⁽²¹⁾, additional domestic policies and measures 4.0 %, use of Kyoto mechanisms 2.6 % and use of carbons sinks 0.8 %).
-  The achievement of an 8 % reduction assumes that several Member States substantially over-deliver on their individual targets.

Member States assessment (EU-15)

-  Two Member States — Sweden and the United Kingdom — were on track to achieve their burden-sharing targets in 2010 and project that existing domestic policies and measures alone will be sufficient to meet or even exceed their targets.
-  Six more countries anticipate they will exceed (Finland, Luxembourg and the Netherlands) or meet (France, Germany and Greece) their commitment targets by additional measures, use of Kyoto mechanisms, use carbon sinks or a combination thereof.
-  The remaining seven Member States (Belgium, Denmark, Ireland, Spain, Austria, Italy and Portugal) project that they will miss their targets despite the implementation of additional measures or the use of Kyoto mechanisms or carbon sinks.

⁽²¹⁾ Without existing policies and measures, total EU-15 greenhouse gas emissions would have been higher than the base-year level. The total effect of the existing policies and measures compared to a theoretical reference scenario without any measures since 1990 would be greater than the 0.6 % reduction referred to here.

In 2004, the aggregate greenhouse gas emissions of EU-15 Member States were 0.9 % below base-year level ⁽²²⁾ with an increase of 0.3 % from 2003 to 2004 (Figure 4.1). The rising trend for greenhouse gas emissions in the EU-15 continued from 1999 and by 2004 they were at their highest levels since 1996. By 2004, after a lapse of more than two thirds of the period between 1990 and the first commitment period (2008–2012), reductions were little more than one tenth of that needed to reach the EU-15 target.

Greenhouse gas emission reductions from domestic policies and measures up to 2004 were not sufficient for many EU-15 Member States to be on track to meeting their targets. In 2004, the greenhouse gas emissions of most Member States were well above their hypothetical target paths from their base-year emissions to their 2010 targets (Figure 4.2). Even though carbon sinks were incorporated into the analysis for the first time, the distance to target for the EU-15 increased by 0.5 percentage points compared to last year. Emission reductions in the early 1990s were largely the result of:

- increasing efficiency in power and heating plants;
- the economic restructuring in eastern Germany;
- the liberalisation of the energy market and subsequent changes in the choice of fuel used in electricity production from oil and coal to gas in the United Kingdom;
- significant reductions in nitrous oxide emissions in the chemical industry in France, Germany and the United Kingdom (see Chapter 9).

After an increasing trend in CO₂ emissions from 1999 to 2003, emissions from electricity production in EU-15 slightly decreased between 2003 and 2004. This was partly due to a significant increase in the share of renewable energy sources in electricity production, which helped to limit the emissions in that sector (see Chapter 9). Greenhouse gas emissions from transport have increased every year since 1990 in most Member States. Only Germany, France and Portugal managed to stabilise transport emissions in recent years.

Under the Kyoto Protocol, in addition to domestic policies and measures Member States can use

flexible mechanisms to help meet their targets. The three types of Kyoto mechanisms are joint implementation (JI), clean development mechanism (CDM) and international emission trading. Several countries have intentions to use these instruments, but only some are in an advanced stage of implementing Kyoto mechanisms (see Chapter 7). In all projections discussed in this report, Kyoto mechanisms are taken into account as long as the European Commission has raised no objections to their intended use in the national allocation plans of the EU emission trading scheme (Directive 2003/87/EC) of the respective Member States. Additional information from the third and fourth national communications under the UNFCCC and a recent questionnaire under the greenhouse gas monitoring mechanism (Directive 2004/280/EC) are taken into account, if the intended use is substantiated sufficiently (e.g. by signed contracts or initiated carbon purchase tenders, operational programme, designated national authority, budgetary resources).

According to Articles 3.3 and 3.4 of the Kyoto Protocol, additional CO₂ removals from land use, land use change and forestry (LULUCF) activities can be accounted for in reaching the Kyoto targets. While accounting for the activities covered by Article 3.3 (afforestation, reforestation and deforestation) is mandatory, developed countries may elect to account for Article 3.4 activities (forest management, cropland management, grazing land management and revegetation). Ten countries of the EU-15 (Austria, Denmark, Finland, Ireland, Italy, Portugal, Spain, Sweden and the United Kingdom) provided quantitative projections on their carbon sinks. Several Member States estimate that carbon sinks will contribute to their efforts towards their burden sharing targets (see Chapter 10).

Based on 2004 emission trends and 2010 projections, two Member States (Sweden and the United Kingdom) were on track to achieve their burden-sharing targets by 2010 using existing domestic policies and measures.

Six more Member States expect to exceed (Finland, Luxembourg and the Netherlands) or meet (France, Germany and Greece) their commitment targets by additional measures and/or use of Kyoto mechanisms and/or the use carbon sinks (Figures 4.3 and 4.4):

⁽²²⁾ Latest base-year data available from national greenhouse gas inventories, as of 6 June 2006. See for more detail EEA report 'Annual European Community greenhouse gas inventory 1990–2004 and inventory report 2006': http://reports.eea.europa.eu/technical_report_2006_6/en. However, final base-year data will be available in the report on the EU's assigned amount (pursuant to Article 3, Paragraphs 7 and 8 of the Kyoto Protocol) under the UNFCCC, due for publication end of 2006.

- France, Germany and Greece were on track in 2004 and project that they will reach their targets by 2010 using additional domestic policies and measures and in the case of France by accounting for forest management activities under Article 3.4.
- If the effect of the Kyoto mechanisms is accounted for, the Netherlands was on track in 2004 and projects that it will reach its commitment with a combination of additional domestic measures and Kyoto mechanisms in 2010.
- Finland was not on track in 2004, but project that it will achieve its target by 2010 through a combination of additional domestic policies and measures as well as the use of the Kyoto mechanisms.
- Luxembourg was not on track in 2004, but projects that it will reach its target by 2010 through a combination of domestic policies and measures as well as the use of the Kyoto mechanisms.

The remaining seven Member States project that they will miss their targets despite the implementation of additional measures and/or the use of Kyoto mechanisms and/or carbon sinks:

- Belgium was not on track in 2004 and does not project that it will reach its target despite the planned implementation of additional policies and measures as well as the use of Kyoto mechanisms.
- The other three Member States (Austria, Italy, Portugal) were not on track in 2004 and do not project that they will reach their targets with additional domestic policies and measures, even when the effects of using the Kyoto mechanisms and carbon sinks are taken into account.
- Denmark and Ireland and Spain were not on track in 2004 and project that they will not reach their targets with existing domestic policies and measures, even when the effects of using the Kyoto mechanisms and carbon sinks are included. Information on possible additional measures was not available.

For 2010, the aggregate projections for EU-15 of greenhouse gas emissions based on existing domestic policies and measures are only 0.6 % below base-year levels (Figure 4.1). This means that the current emission reduction of 0.9 % achieved by 2004 from the base-year level is projected to decrease by

0.3 percentage points by 2010. This shortfall of 7.4 % between the projections with existing measures and the EU Kyoto target is 1.0 % larger than the one reported last year. This is mainly due to revised projections by Spain, France, the United Kingdom and Austria.

Key additional policies and measures reported by Member States are: promoting electricity generation from renewable energy sources, cogeneration policies and energy efficiency policies (Chapter 9). The additional domestic measures reported have the potential to reduce the gap by 4.7 %. Thus, emission reductions achieved through domestic measures alone will not suffice to reach the Kyoto target. The use of Kyoto mechanisms is projected to deliver an additional 2.6 % emission reduction. The total removal due to Article 3.3 and 3.4 activities in the EU-15 is estimated to be about 33 million tonnes CO₂-equivalents per year, corresponding to an additional 0.8 %. The deduction of net emissions from the land use, land use change and forestry sector in the base-year according to Article 3.7 of the Kyoto Protocol contributes an additional 1.5 million tonne CO₂-equivalent per year. This leads to a total reduction of about 8.0 % (including additional measures, Kyoto mechanisms and carbon sinks).

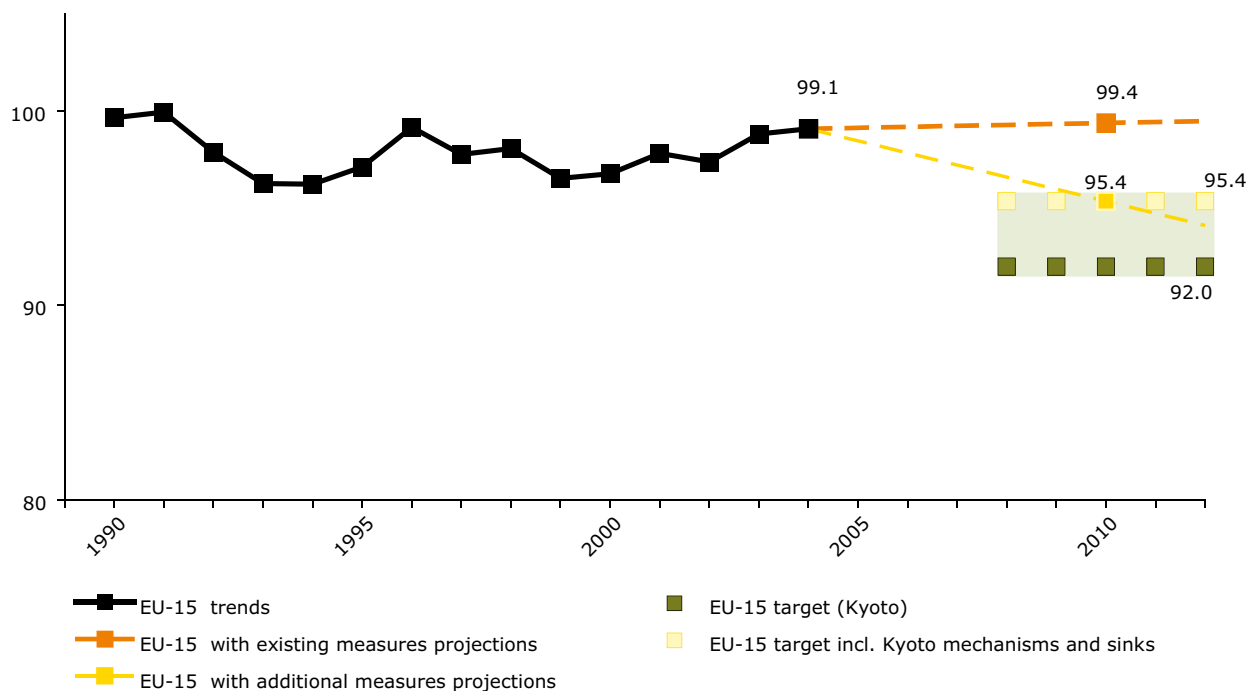
Hence, the EU-15 target will only be reached if:

- all additional measures reported are put into force;
- Kyoto mechanisms are used to the full extent planned;
- removals from Article 3.3 and 3.4 activities (carbon sinks) contribute to the extent projected by the Member States;
- over-delivery by several Member States compensates for shortfalls by others.

With additional measures, Kyoto mechanisms and carbon sinks, the total projected over-delivery by eight Member States amounts to 103 million tonnes of CO₂-equivalents; more than 80 % of which would come from the United Kingdom. This amount will be required to compensate for the shortfall of other Member States. According to the current projections, if all existing and additional measures as well as Kyoto mechanisms and Article 3.3/3.4 activities are accounted for, the EU-15's overall reductions will exceed its target by a very narrow margin of 0.02 %. This value, however, is significantly smaller than the uncertainty of the projections. Therefore, based on the figures available, it cannot be taken for granted that the target will be achieved.

Figure 4.1 Actual and projected EU-15 greenhouse gas emissions compared with the Kyoto target for 2008–2012, including Kyoto mechanisms and carbon sinks

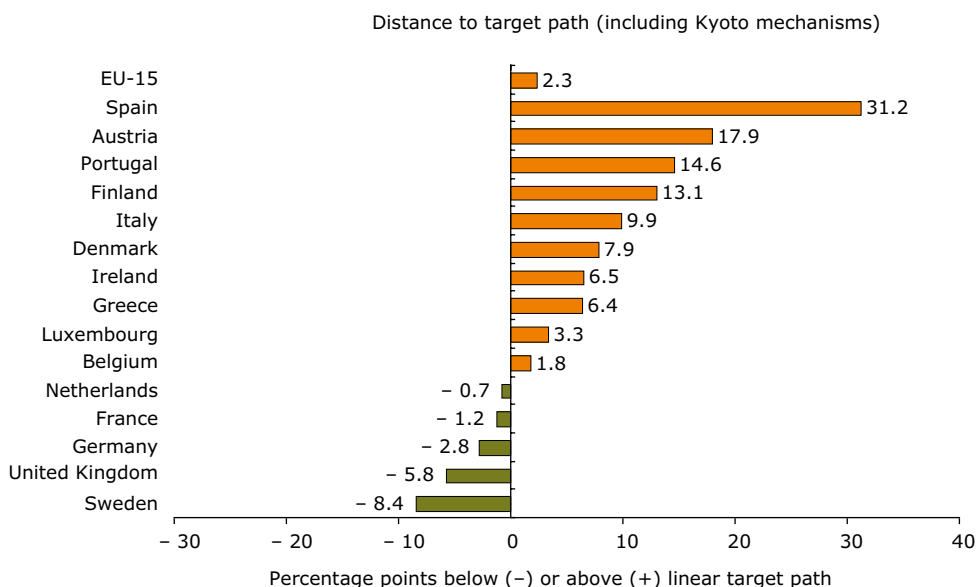
GHG emissions (base year = 100)



Note: The EU-15 target including Kyoto mechanisms and sinks is based on an estimated projected use of Kyoto mechanisms and activities under Article 3.3 and 3.4 (carbon sinks). The Kyoto mechanisms account for 2.6 % of the EU target of 8%, and 3.3/3.4 activities contribute additional 0.8 %. Thus, the (theoretical) target for the EU-15 including Kyoto mechanisms and sinks is presented in the graph as 92.0 + 3.4. For more information on Kyoto mechanisms and carbon sinks, see Chapters 7 and 10.

Source: EEA, based on EU-15 Member States greenhouse gas inventories and projections.

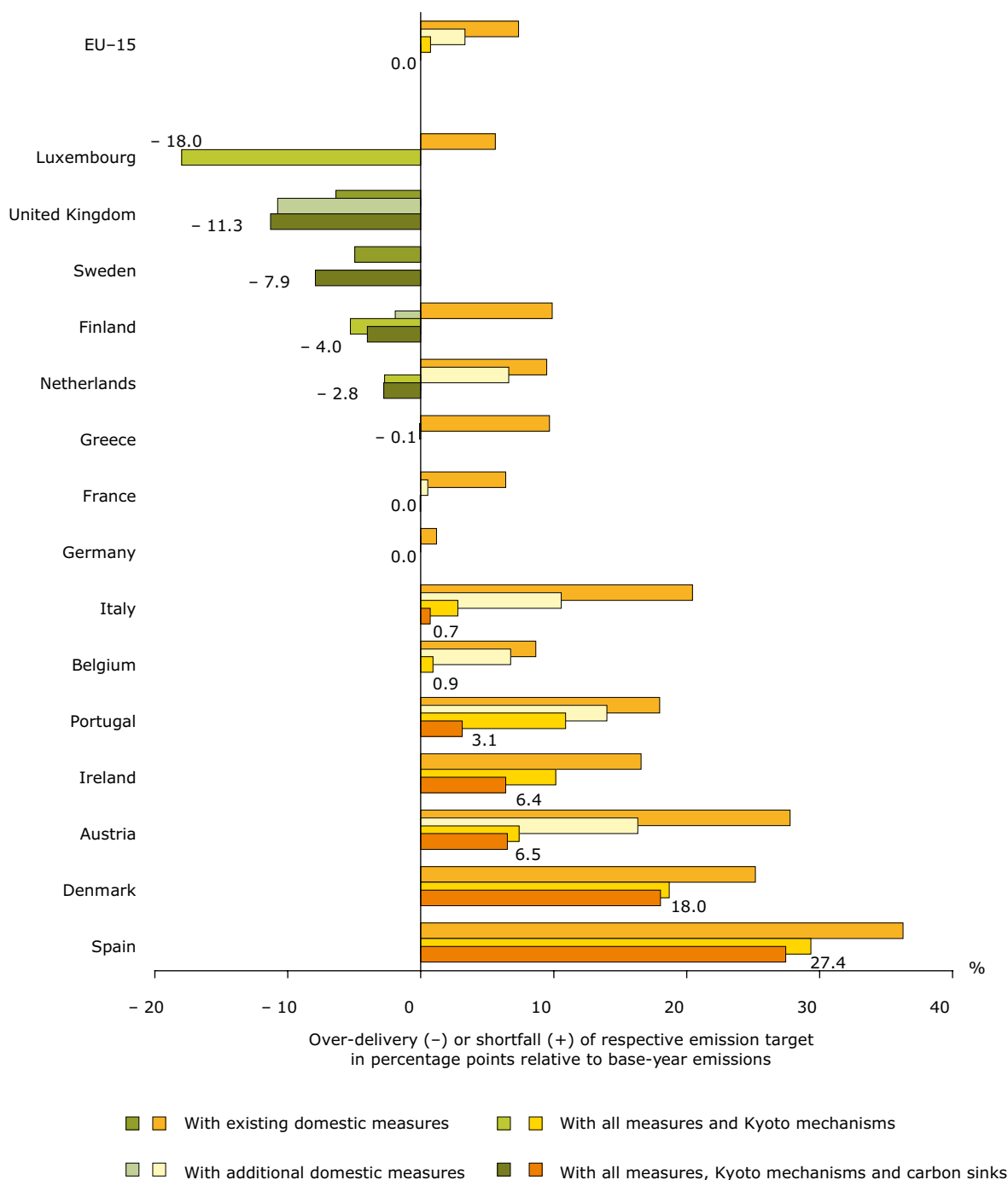
Figure 4.2 Distance-to-target (burden-sharing targets) for EU-15 Member States in 2004, including Kyoto mechanisms and carbon sinks



Note: The distance-to-target indicator (DTI) measures the deviation in percentage points of actual emissions in 2004 from a (hypothetical) linear path between base-year emissions and the burden-sharing target for 2010. A positive value suggests an under-achievement and a negative value an over-achievement by 2004. The DTI is used as an early indication of progress towards the Kyoto and Member States' burden-sharing targets. The use of Kyoto mechanisms and carbon sinks was included where data was available.

Source: EEA, based on EU-15 Member States greenhouse gas inventories.

Figure 4.3 Relative gaps (over-delivery or shortfall) between greenhouse gas projections based on domestic policies and measures and 2010 ⁽²³⁾ targets for EU-15 Member States including the effects of Kyoto mechanisms and net emissions and removals from carbon sinks



Note: All EU-15 Member States provided projections assuming existing domestic policies and measures. Several countries provided projections with additional domestic policies and measures. The effect of the Kyoto mechanisms is shown separately for the ten countries that intend to use them for reaching their target data. For more information see Chapter 7. Data on the net effect of emissions and removals from carbon sinks under Article 3.3 and 3.4 of the Kyoto Protocol were provided by ten countries and were considered where available. Adjustments of the reduction target according to Article 3.7 were performed for Portugal, the United Kingdom and the Netherlands.

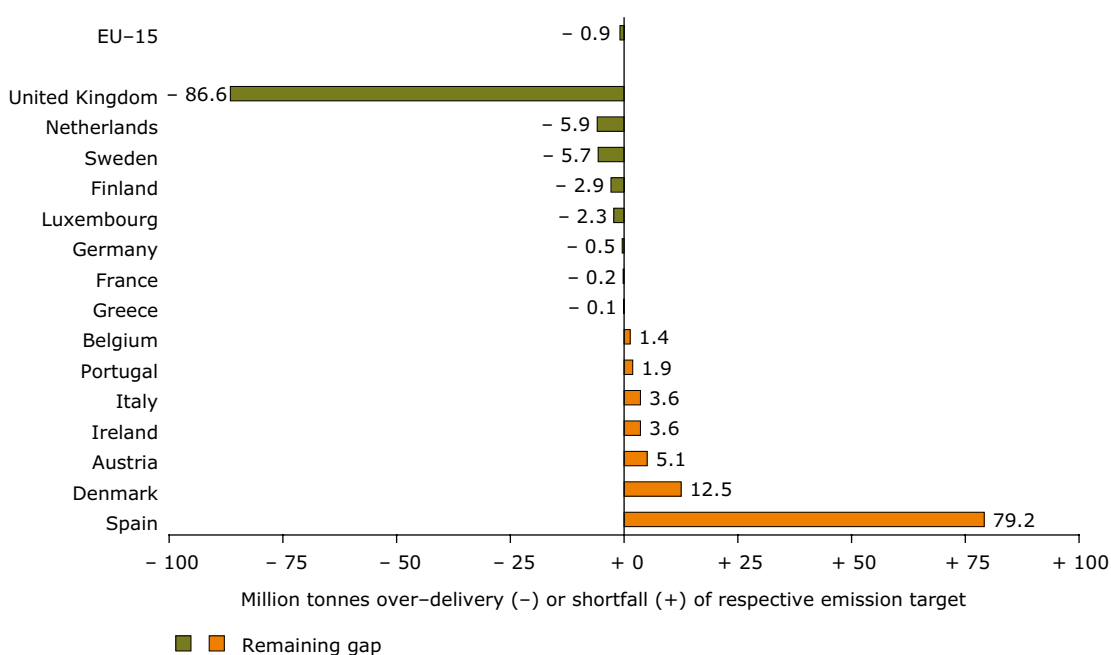
Source: EEA, based on EU-15 Member States projections.

⁽²³⁾ In the Council decision (2002/358/EC) on the approval by the EU of the Kyoto Protocol the various commitments of the Member States are expressed as percentage changes from the base-year. In 2006 the respective emission levels will be expressed in terms of tonnes of CO₂-equivalents.

Table 4.1 EU-15 targets and emission reductions for four different national projections

Country	Target	Gap for scenario (percentage points relative to base-year emissions)			
		With existing policies and measures (PAMs)	With additional PAMs	With existing and additional PAMs and Kyoto mechanisms (KMs)	With existing and additional PAMs, KMs and carbon sinks
Austria	- 13.0 %	27.8	16.3	7.4	6.5
Belgium	- 7.5 %	8.7	6.8	0.9	Not available
Denmark	- 21.0 %	25.2	Not available	18.7	18.0
Finland	0.0 %	9.9	- 1.9	- 5.3	- 4.0
France	0.0 %	6.4	0.5	Not available	0.0
Germany	- 21.0 %	1.2	0.0	Not available	Not available
Greece	25.0 %	9.7	- 0.1	Not available	Not available
Ireland	13.0 %	16.6	Not available	10.2	6.4
Italy	- 6.5 %	20.4	10.6	2.8	0.7
Luxembourg	- 28.0 %	5.6	Not available	- 18.0	Not available
Netherlands	- 6.0 %	9.6	6.7	- 2.6	- 2.8
Portugal	27.0 %	19.7	15.7	12.6	3.1
Spain	15.0 %	36.3	Not available	29.3	27.4
Sweden	4.0 %	- 5.0	Not available	Not available	- 7.9
United Kingdom	- 12.5 %	- 6.3	- 10.7	Not available	- 11.3
EU-15	- 8.0 %	7.4	3.4	0.8	0.0

Source: EEA, based on EU-15 Member States projections.

Figure 4.4 Remaining gap (over-delivery or shortfall) in absolute terms including the effects of additional policies and measures, Kyoto mechanisms and carbon sinks

Source: EEA, based on EU-15 Member States projections.

5 Greenhouse gas emissions in new EU Member States



All new EU Member States, except Slovenia, were on track in 2004 to meet their Kyoto targets using existing domestic policies and measures. Slovenia projects that it will meet its Kyoto target with additional policies and measures and by including CO₂ removals from land-use change and forestry.



The aggregated emissions of the new EU Member States were 23 % below 1990 levels in 2004. By 2010, however, greenhouse gas emissions are projected to increase by 11 percentage points to 12 % below 1990 levels, even if all additional domestic measures are implemented.



Greenhouse gas emissions from transport decreased by 6 % between 1990 and 1995 but increased sharply from 1995 onwards. By 2004 these emissions exceeded 1990 levels by 28 %.

All new Member States that joined the EU on 1 May 2004 have to reach their Kyoto targets individually (except Cyprus and Malta, which have no Kyoto targets). This section shows the overall aggregated trends in the eight new Member States with targets (EU-8) to facilitate comparison with the EU-15.

During the 1990s total emissions declined substantially in almost all new Member States, mainly due to the introduction of market economies and the consequent restructuring or closure of heavily polluting and energy-intensive industries (Figure 5.1). Since 2000, however, the emissions have levelled off or even slightly increased due to enhanced economic development. In 2004, the aggregated emissions were 23 % below 1990 levels. Emissions of almost all new Member States were well below their linear target paths. Thus, they were on track to meet their Kyoto targets (Figure 5.2).

Emissions from transport increased in the second half of the 1990s, exceeded 1990 levels in 1999 and increased further until 2004. The new Member States seem to be repeating the experience of Ireland, Portugal and Spain. Starting from a relatively low transport level, all these countries experienced strong growth in transport and its greenhouse gas emissions due to high economic growth.

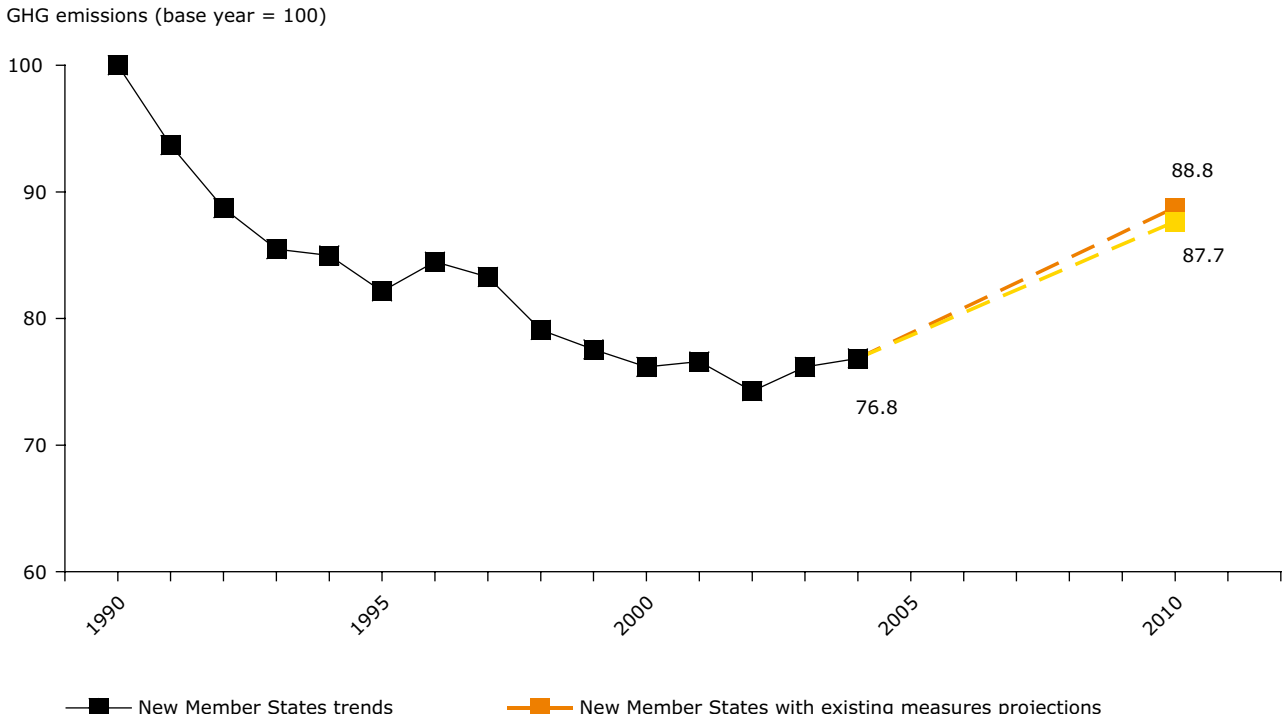
Seven new Member States project that they will meet or even over-comply with their Kyoto targets by 2010 using existing domestic policies and

measures. Slovenia projects that it will meet its Kyoto target with additional policies and measures and by including carbon dioxide removals from land-use change and forestry (Figures 5.3 and 5.4).

Emissions aggregated from all new Member States (excluding Cyprus and Malta for which data were not available) are projected to increase after 2004. All countries have policies and measures in place to reduce greenhouse gas emissions, and six countries have identified additional policies and measures. With existing measures, they will still be 11 % below 1990 levels by 2010 (Figure 5.1). With additional measures, emissions are projected to be 1 % lower. Only Estonia projects decreasing emissions between 2004 and 2010 with existing measures. With additional measures, also the Czech Republic projects a slight decrease. All other EU-8 Member States project significant increases from 2004 emission levels (see Annex for further details).

Slovenia is the only country out of the EU-8 that intends to use Kyoto mechanisms as an investor country, but has not yet decided on their contribution to its Kyoto target.

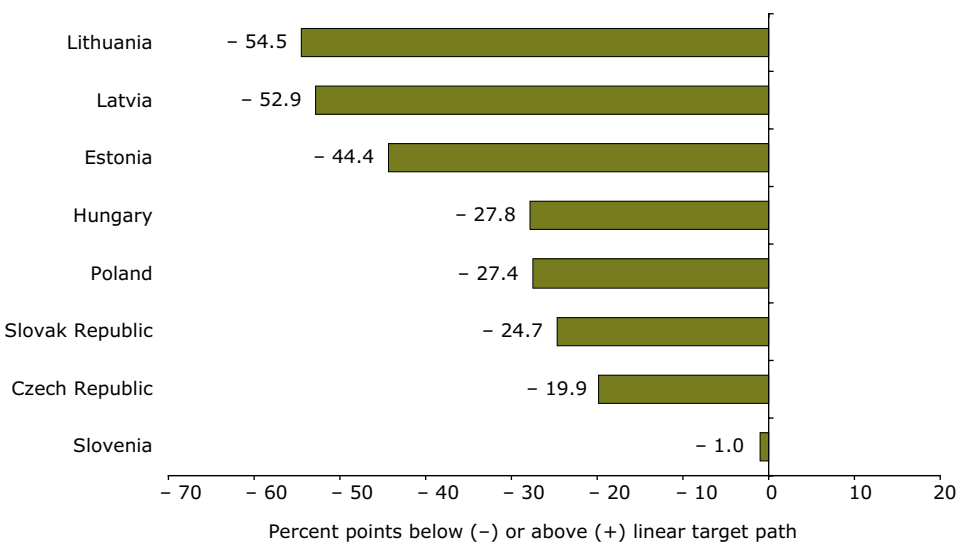
Figure 5.1 Actual and projected greenhouse gas emissions aggregated for eight new Member States



Note: Data exclude emissions and removals from land-use change and forestry. Due to lack of data, Cyprus and Malta are not included.

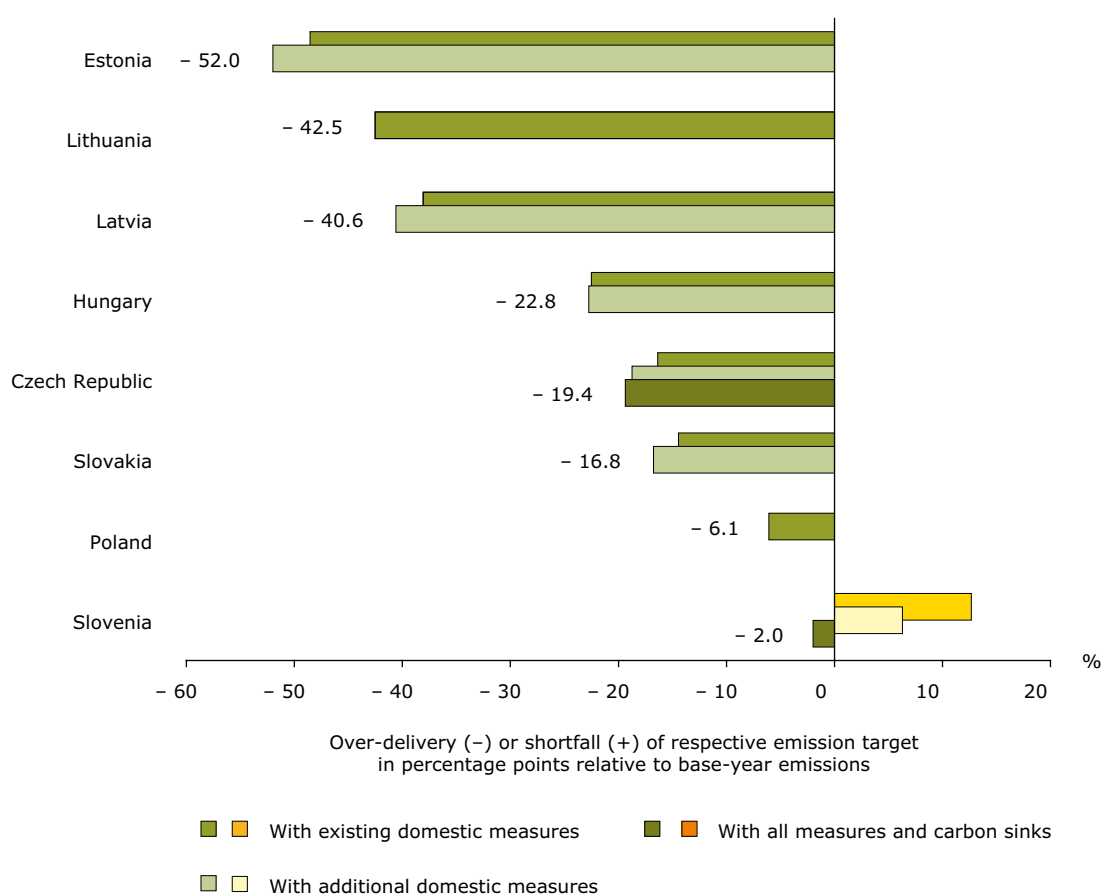
Source: EEA, based on new Member States greenhouse gas inventories and projections.

Figure 5.2 Distance-to-target (Kyoto Protocol) for new Member States in 2004



Note: The distance-to-target indicator (DTI) measures the deviation of actual emissions in 2003 from a (hypothetical) linear target path between 1990 and 2010. A positive value suggests an under-achievement by 2003 and a negative value represents an over-achievement by 2003. The DTI is used as an early indication of progress towards the Kyoto targets. Countries with base-years other than 1990 are Hungary (average 1985–1987), Poland (1988) and Slovenia (1986). For Slovenia, the effect of activities under Articles 3.3 and 3.4 of the Kyoto Protocol was also considered.

Source: EEA, based on new Member States greenhouse gas inventories.

Figure 5.3 Relative gaps (over-delivery or shortfall) between projections and targets for 2010 for new Member States

Note: Projections for Poland do not include all Kyoto gases (only CO₂ and N₂O).

Source: EEA, based on new Member States projections.

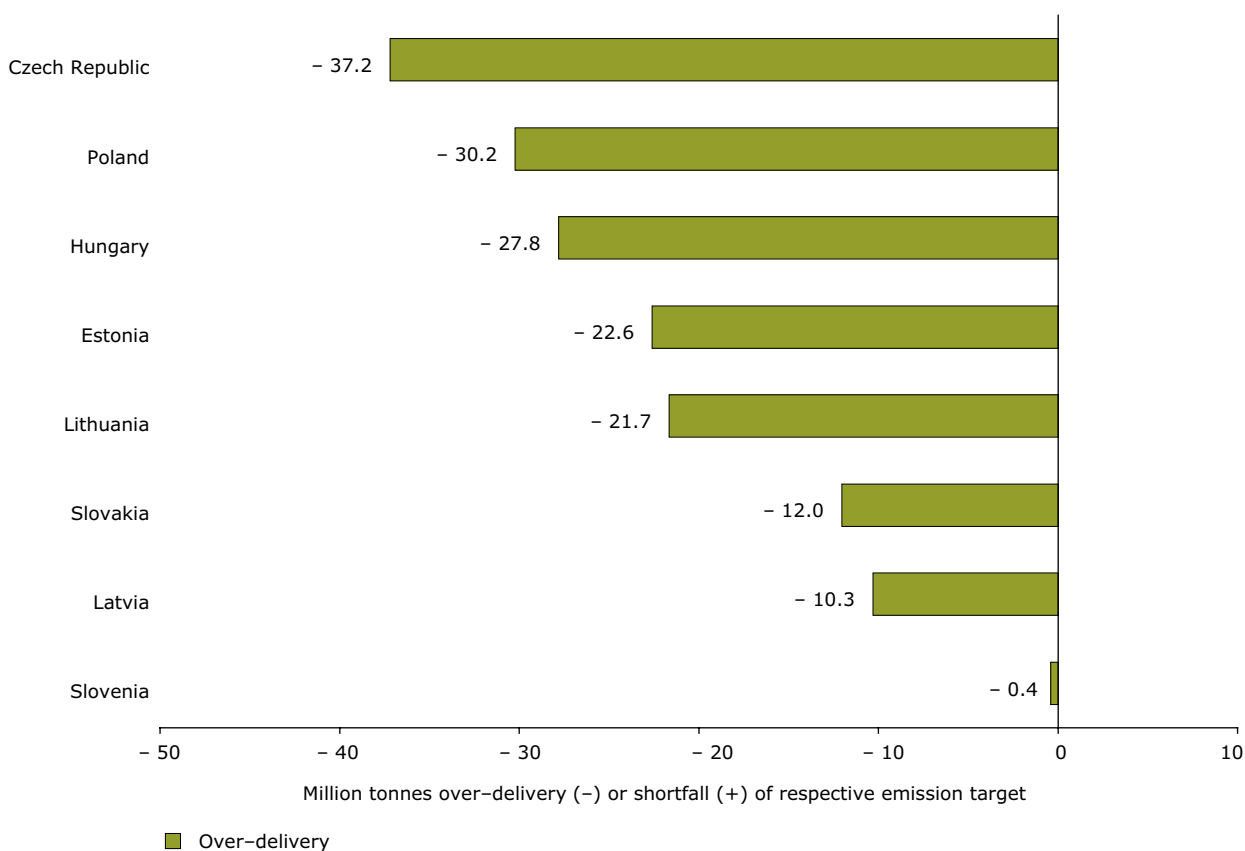
Table 5.1 EU-8 targets and projected emission reductions for four different scenarios

Country	Target	Gap for scenario (percentage points relative to base-year emissions)		
		With existing policies and measures (PAMs)	With additional PAMs	With existing and additional PAMs, KMs and carbon sinks
Czech Republic	- 8.0 %	- 16.4 %	- 18.7 %	- 19.5 %
Estonia	- 8.0 %	- 48.5 %	- 52.0 %	Not available
Hungary	- 6.0 %	- 22.5 %	- 22.8 %	Not available
Latvia	- 8.0 %	- 38.1 %	- 40.6 %	Not available
Lithuania	- 8.0 %	- 42.5 %	Not available	Not available
Poland	- 6.0 %	- 6.1 %	- 6.1 %	Not available
Slovakia	- 8.0 %	- 14.4 %	- 16.8 %	Not available
Slovenia	- 8.0 %	+ 12.7 %	+ 6.3 %	- 2.0 %

Note: Projections for Poland consist only of projections for CO₂ and N₂O.

Source: EEA, based on new Member States greenhouse gas projections.






Figure 5.4 Remaining gap projected for 2010 by the new Member States in absolute terms, including the effects of additional policies and measures as well as carbon sinks



Note: Projections for Poland do not include all Kyoto gases (only CO₂ and N₂O).

Source: EEA, based on new Member States greenhouse gas projections.

6 Greenhouse gas emissions in EU acceding countries and other EEA member countries

-  All EU acceding countries with a Kyoto target and Iceland were on track to meet or even over-achieve their Kyoto targets.
-  Turkey and Croatia have ratified the UNFCCC, but not the Kyoto Protocol.
-  Bulgaria and Romania project that they will over-achieve their targets using domestic additional policies and measures.
-  In 2004, Switzerland was not on track. However, it projects to reach its target with additional domestic policies and measures as well as the use of Kyoto mechanisms.
-  In 2004, Norway and Liechtenstein were not on track but project to reach their targets with existing domestic policies and measures as well as the use of Kyoto mechanisms.

Analyses for Bulgaria and Romania (EU acceding countries), Croatia and Turkey (in accession negotiations with the EU), and Iceland, Liechtenstein, Norway and Switzerland (European Environment Agency members ⁽²⁴⁾) are presented in this section. The assessment in this chapter does not cover Turkey as this country has not ratified the Kyoto Protocol.

In 2004, greenhouse gas emissions for Bulgaria, Croatia and Romania were well below their linear target paths. In other words, they were on track to meet their Kyoto targets (Figure 6.1). Iceland was on track to achieve its emission limitation of + 10 % under the Kyoto Protocol. Switzerland, Liechtenstein and Norway were not on track to reach their targets of – 8 %, – 8 % and + 1 %, respectively, according to their distance to target emissions indicator in 2004.

Per capita greenhouse gas emissions in Bulgaria, Romania and Iceland declined significantly from 1990 to 2004. Switzerland, Croatia and Liechtenstein had a slight decrease in per capita emissions, whereas Norway's per capita emissions increased slightly during the same time span (Figure 6.3). Turkey's per capita emissions increased substantially, at 4.2 tonnes per year in 2004.

However, the per capita emissions in Turkey are still less than half of the average EU-25 per capita emissions.

The emission level per GDP has declined in all countries from 1995 to 2004 indicating that economic growth and resource consumption have somewhat decoupled (Figure 6.4). In Bulgaria and Romania the greenhouse gas intensity is more than double the EU average. By contrast, the greenhouse gas intensity in Switzerland is only about half of the EU average.

For 2010, projections taking into account domestic policies and measures show that Bulgaria, Romania and Iceland will over-achieve their Kyoto targets. Norway and Liechtenstein will fall short using existing domestic policies and measures only (Figure 6.2). However, Norway and Liechtenstein plan to invest in Kyoto mechanisms to close or reduce their gaps. Switzerland plans to reach its target by implementing additional domestic measures and using Kyoto mechanisms. No projections were available for Croatia.

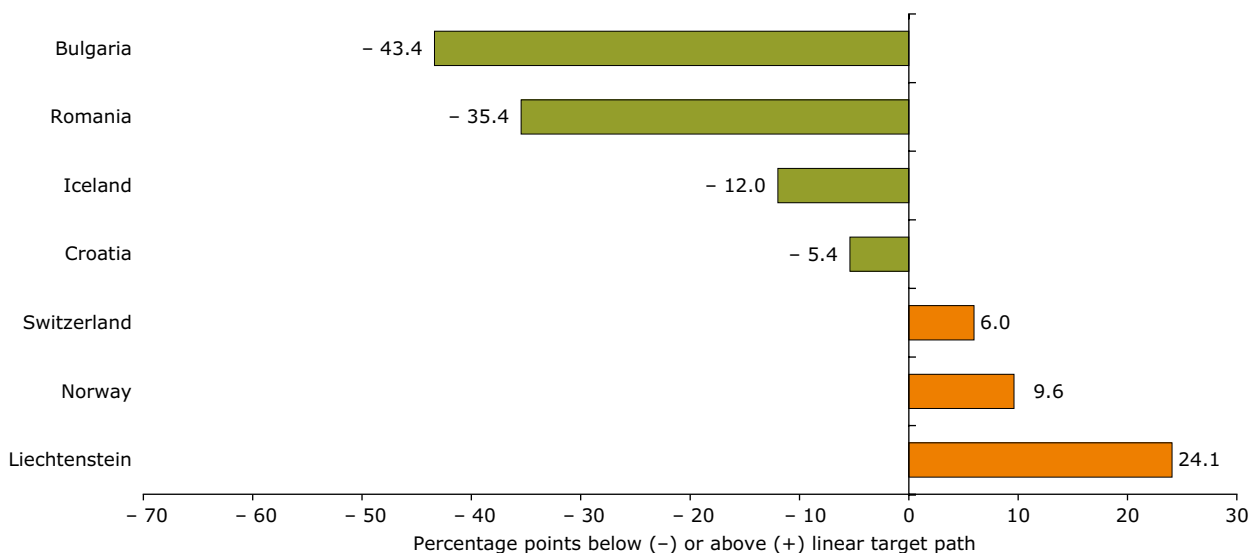
In their fourth national communications, Norway, Switzerland and Liechtenstein indicated that they will make use of Kyoto mechanisms to reach their

⁽²⁴⁾ As of April 2006, the EEA has 32 member countries: all EU-25 Member States, Bulgaria, Iceland, Liechtenstein, Norway, Romania, Switzerland and Turkey.

targets. However, since no detailed information on the use of flexible mechanisms (e.g. organisation, financial budgets, projects etc.) or carbon sinks were

available to the EEA for the non-EU countries, they were not taken into account in the assessment in this report.

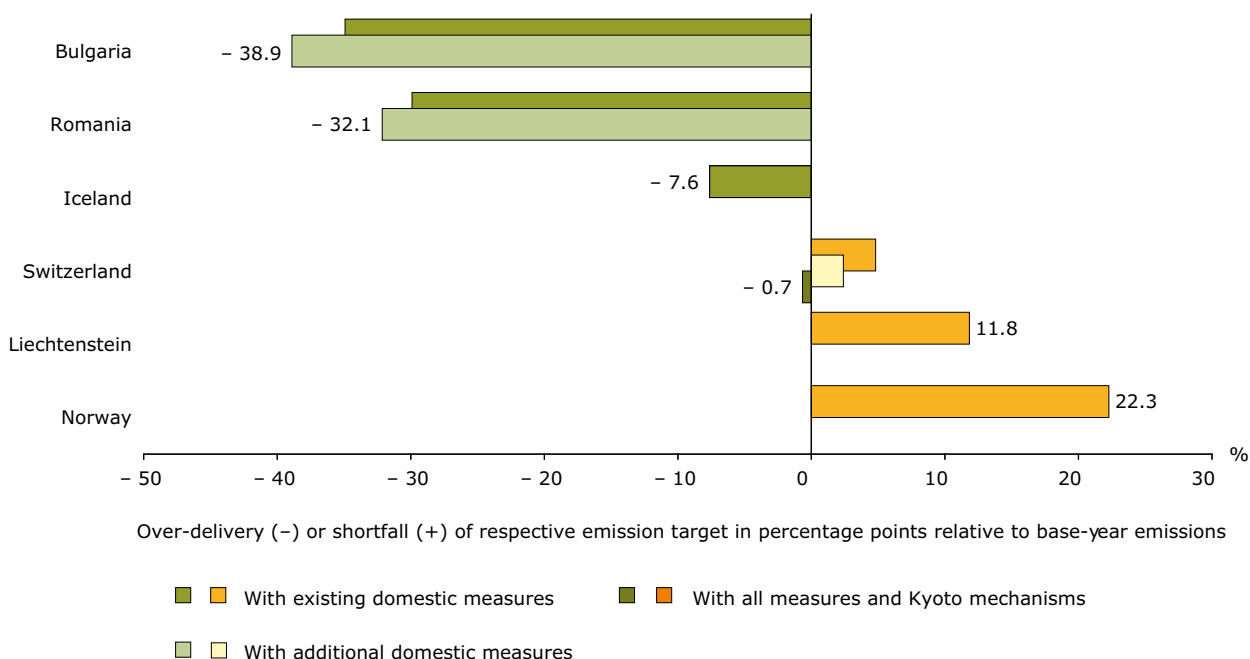
Figure 6.1 Distance to target (Kyoto Protocol) for acceding and other EEA countries in 2004



Note: The distance-to-target indicator (DTI) measures the deviation in percentage points of actual emissions in 2004 from a (hypothetical) linear path between base-year emissions and the burden-sharing target for 2010. A positive value suggests an under-achievement and a negative value an over-achievement by 2004. The DTI is used as an early indication of progress towards the Kyoto targets. The use of Kyoto mechanisms is not accounted for in this figure.

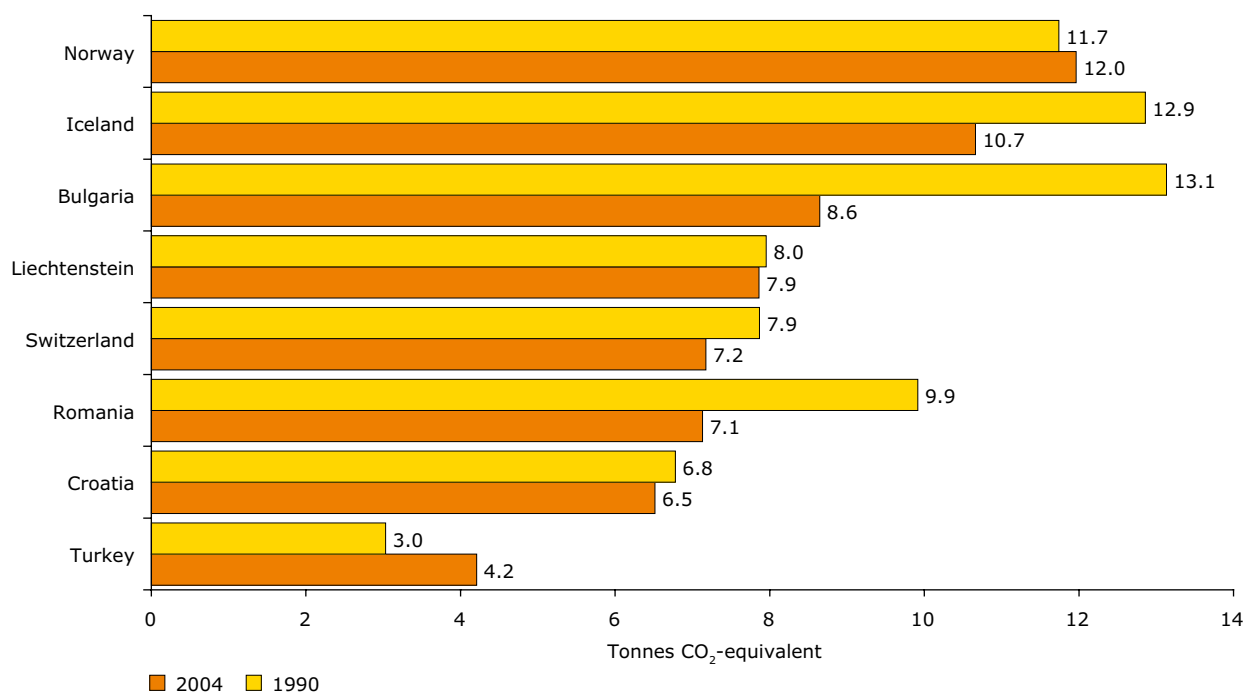
Source: EEA, based on acceding and other EEA countries projections.

Figure 6.2 Relative gaps (over-delivery or shortfall) between projections and targets for 2010 for acceding and other EEA countries

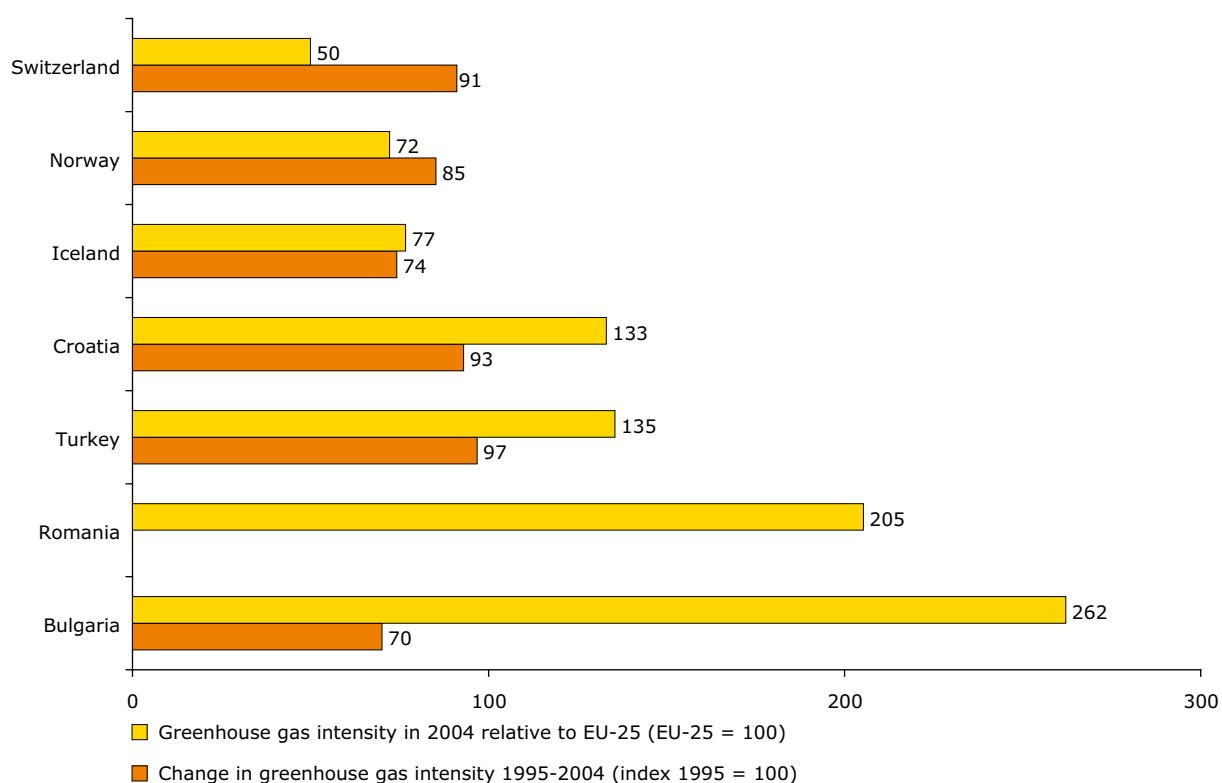


Note: Except for Switzerland, the use of Kyoto mechanisms is not accounted for in this figure. In their fourth national communications to the UNFCCC, Norway, Switzerland and Liechtenstein indicated that they will make use of Kyoto mechanisms to reach their targets. Since the information available on the use of flexible mechanisms or carbon sinks for the non-EU countries was not detailed (except for Switzerland), they were not taken into account here. The projection for Liechtenstein excludes fluorinated gases.

Source: EEA, based on acceding and other EEA countries projections.

Figure 6.3 Greenhouse gas emissions per capita for the acceding countries and other EEA member countries

Source: EEA, based on acceding and other EEA countries greenhouse gas inventories.

Figure 6.4 Greenhouse gas emissions per GDP in the acceding countries and other EEA member countries

Note: The analysis of the change in greenhouse gas intensity was based on GDP data at constant prices (1995 level). The intra-EU analysis of greenhouse gas intensity in 2004 was performed using GDP data in purchasing power standards in order to allow for a meaningful comparison between countries with different price levels. No GDP data was available for Liechtenstein.

Source: EEA, based on acceding and other EEA countries greenhouse gas inventories; Eurostat.

7 Use of Kyoto mechanisms



Ten EU-15 countries (Austria, Belgium, Denmark, Finland, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain) and Slovenia have decided to use the Kyoto mechanisms in order to meet their targets under the Kyoto Protocol. Ten countries (Austria, Belgium, Denmark, Finland, Germany, Ireland, Italy, the Netherlands, Spain and Sweden) have allocated financial resources totalling approximately EUR 2 830 million for the whole 5-year commitment period ⁽²⁵⁾.



The projected use of Kyoto mechanisms by Austria, Belgium, Denmark, Finland, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain to help achieve the EU-15 target has slightly increased compared to previous years' projections, and amounts to 110.5 Mt CO₂-equivalents per year of the commitment period. This corresponds to about 2.6 percentage points (almost one third) of the required emission reduction of – 8 % for the EU-15.

The Kyoto Protocol defines three 'flexibility mechanisms' to lower the overall costs of achieving emissions targets for the commitment period 2008–2012: joint implementation (JI), clean development mechanism (CDM) and international emissions trading. JI enables developed countries to work together to meet their emission targets by means of project activities. The CDM enables a developed country to meet its target, while project activities must be hosted by a developing country. International emission trading allows countries that have achieved emissions reductions over and above those required by their Kyoto targets to sell the excess to countries that find it more difficult or expensive to meet their commitments.

Nineteen Member States (all EU-15 countries plus the Czech Republic, Estonia, Slovakia and Slovenia) have provided information on their intended use of Kyoto mechanisms. This information was provided through a questionnaire under the greenhouse gas monitoring mechanism (Directive 2004/280/EC) and national allocation plans for the first phase (2005–2007) of the EU emissions trading scheme (Directive 2003/87/EC) or the fourth national communication under the UNFCCC. During the assessment of the first national allocation plans (for 2005–2007) the European Commission evaluated the state of advancement of financial and institutional preparations for the use

of Kyoto mechanisms. They found that only some Member States substantiated it sufficiently in their national allocation plans. Information contained in notified second national allocation plans (due date of submission to the European Commission was 30 June 2006) has not been included as this information was not available on time for inclusion in this report.

Twelve EU Member States (Austria, Belgium, Denmark, Finland, France, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Slovenia and Spain) have decided to use the Kyoto mechanisms. Within the EU-15 only Germany and the United Kingdom project they will achieve their Kyoto targets without using Kyoto mechanisms. Greece and Sweden have not yet taken a government decision on the intended use.

The first national allocation plans of eight countries (Austria, Belgium, Denmark, Ireland, Italy, Luxembourg, the Netherlands and Spain) ⁽²⁶⁾ show that the Kyoto mechanisms will contribute substantially to the closure of the gap between GHG projections and 2010 targets. For the EU-15, the intended use of Kyoto mechanisms amounts to 110.5 Mt CO₂-equivalents per year of the commitment period. This amount corresponds to over 30 % of the total required emission reduction for the EU-15; approximately 342 Mt CO₂-equivalents per year

⁽²⁵⁾ Although they have decided to use Kyoto mechanisms, Luxembourg, Portugal and Slovenia are not included in this list as they did not provide quantified information on their budgets. Finland intends to use Kyoto mechanisms to reach its target but has not yet decided on the total quantity of units to be bought. The funds provided by Finland, Germany and Sweden are for pilot programmes. Germany does not intend to use Kyoto mechanisms for reaching its target; Sweden has not yet taken a final decision.

⁽²⁶⁾ As updated in the 2006 questionnaire and additional information provided by Finland and Portugal.

during the first commitment period (an 8 % reduction from base-year emissions) ⁽²⁷⁾.

The status of preparation for the use of JI and CDM project-based activities differs greatly between Member States. Ten Member States have allocated resources for the use of Kyoto mechanisms (Austria, Belgium, Denmark, Finland, Germany, Ireland, Italy, the Netherlands, Spain and Sweden). Austria, Italy, the Netherlands ⁽²⁸⁾ and Spain allocated the largest budgets (EUR 288 million, EUR 1 320 million, EUR 600 million and EUR 250 million, respectively, for the five-year commitment period). The total

budget allocated by the ten Member States amounts to approximately EUR 2 830 million.

Of the remaining group of EEA member countries, two countries intend to use flexible mechanisms. Norway reported that it will acquire around 50 million tonnes of CO₂-equivalents in total for the first commitment period under the Kyoto Protocol. Switzerland is charging a 'climate cent' on transport fuels which will be used to reduce emissions domestically and to invest in Kyoto mechanism projects abroad. Up to a total of 8 Mt CO₂-equivalents will be bought by Switzerland for the first commitment period through this mechanism.

Table 7.1 Summary of use of Kyoto mechanisms in EU-25

	Information provided on the intended use of Kyoto mechanisms	Decided use of Kyoto mechanisms	Projected use of Kyoto mechanisms for reaching target	Financial resources allocated for using Kyoto mechanisms
Total EU-25	19	12		
Total EU-15	15	11	9	10
Austria	X	X	X	X
Belgium	X	X	X	X
Denmark	X	X	X	X
Finland	X	X	X	X
France	X	X		
Germany	X			X
Greece	X			
Ireland	X	X	X	X
Italy	X	X	X	X
Luxembourg	X	X	X	
Netherlands	X	X	X	X
Portugal	X	X	X	
Spain	X	X	X	X
Sweden	X			X
United Kingdom	X			
Total EU-10	4	1		
Czech Republic	X			
Cyprus				
Estonia	X			
Slovakia	X			
Slovenia	X	X		
Hungary				
Latvia				
Lithuania				
Malta				
Poland				

⁽²⁷⁾ Additionally, Sweden estimates that it will buy approximately 1 million tonnes of CO₂-equivalents per year through a pilot programme. This is not included in the EU total as Sweden has not yet decided whether flexible mechanisms will be used for reaching its Kyoto target.

⁽²⁸⁾ The Netherlands reported that it has been decided to increase the budget by 10 % in 2007 to counter rising carbon allowance prices and the risks of project failure.

8 The European Union emissions trading scheme



In June 2005, the Commission accepted all first phase 25 national allocation plans (NAPs), corresponding to more than 10 500 installations. Verified data for 2005 emissions were published by the Commission in May 2006.

The EU emissions trading scheme (ETS) was established by Directive 2003/87/EC⁽²⁹⁾. It covers CO₂ emissions⁽³⁰⁾ from large stationary sources including power and heat generators, oil refineries, ferrous metals, cement, lime, glass and ceramic materials, and pulp and paper. Other sectors, such as the transport sector which accounts for a significant part of CO₂ emissions, are not covered by the ETS. Under the ETS operators receive (emission) allowances which have to be surrendered after each year according to the actual verified emissions of an installation during that year. Operators holding more allowances than actual verified emissions may sell unneeded allowances to operators in need of more allowances or keep them for future years. The Linking Directive⁽³¹⁾ allows operators to buy JI/CDM credits and bring them into the EU ETS to fulfil their obligations. From 2008 EU Member States will specify to what extent companies can use these units.

On 20 June 2005, the Commission accepted the last of the 25 national allocation plans (NAPs), for the first phase (2005–2007), herewith finishing the first phase allocation process for more than 10 500 installations. In total, the Commission has approved the allocation of approximately 2.16 billion allowances per year for the first trading period 2005 to 2007. 78.5 million allowances have been put aside by

Member States in new entrants reserves to allocate allowances to operators entering the market.

On 1 January 2005 the EU-wide ETS started. Verified data for 2005 emissions were published by the Commission in May 2006. Table 8.1 gives an overview on some key data of the ETS.

The emissions trading sector accounts for about 40 % of EU's total GHG emissions. However, the coverage varies substantially between Member States. In Luxembourg, Sweden and France the emissions trading sector accounts only for less than one third of the total national emissions. In some of the new Member States, however, the emissions trading scheme covers more than two thirds of their total GHG emissions (Estonia, Malta and Czech Republic). On average, the level of coverage in the new Member States is higher (46 %) than in EU-15.

The Member States were requested, under the EU ETS, to submit to the European Commission second national allocation plans for the Kyoto Protocol commitment period (2008–2012) by 30 June 2006 at the latest. This report only includes data provided up to 6 June 2006. Hence, it did not take into account second NAPs.

⁽²⁹⁾ OJ L 275, 25.10.2003, p. 32.

⁽³⁰⁾ Other greenhouse gases emissions regulated under the Kyoto Protocol (CH₄, N₂O, HFCs, PFCs and SF₆) are not covered by the emissions trading scheme.

⁽³¹⁾ OJ L 338, 13.11.2004, p. 18.

Table 8.1 Key figures of the EU emissions trading scheme for 2005 to 2007

Member State	Number of installations covered ⁽¹⁾	CO ₂ allowances per year of the period 2005 to 2007 ⁽²⁾ (million allowances)	Verified emissions (million tonnes of CO ₂)	ETS share in total greenhouse gas emissions ⁽³⁾
EU-15				
Austria	199	32.6	33.4	36.6 %
Belgium	310	59.8	55.4	37.4 %
Denmark	384	31.0	26.5	38.9 %
Finland	595	44.5	33.1	40.6 %
France	1 087	150.5	131.3	23.3 %
Germany	1 850	495.0	474.0	46.7 %
Greece	140	71.1	71.3	51.8 %
Ireland	109	19.2	22.4	32.7 %
Italy	950	207.5	223.6	38.6 %
Luxembourg	15	3.2	2.6	20.5 %
Netherlands	210	86.4	80.4	36.9 %
Portugal	244	36.8	36.4	43.1 %
Spain	825	162.1	182.9	42.9 %
Sweden	705	22.5	19.3	27.8 %
United Kingdom	775 ⁽⁴⁾	209.3	242.5	36.8 %
EU-10				
Cyprus	13	5.6	5.1	57.3 %
Czech Republic	395	96.6	82.5	56.1 %
Estonia	44	18.7	12.6	59.3 %
Hungary	234	30.2	26.0	31.3 %
Latvia	94	4.0	2.9	26.7 %
Lithuania	99	11.4	6.6	32.5 %
Malta	2	2.1	n.a. ⁽⁵⁾	65.6 %
Poland	1 088	239.1	200.8 ⁽⁶⁾	52.0 %
Slovakia	175	30.3	25.2	49.5 %
Slovenia	98	8.6	8.7	43.4 %

- Notes:** ⁽¹⁾ Exact numbers vary slightly continuously due to closures and new entrants. The number of installations and verified emissions are taken from the CITL as of 5 September 2006. In Poland, Malta and Cyprus the registry is either not yet functional or only few operators have opened an account. For these countries the final allocation decision was used as data source.
- ⁽²⁾ The average amount of CO₂ allowances 2005–2007 excludes the national new entrants reserves and takes into account temporary exclusion and opt-ins of installations in accordance with Articles 24 and 27 of the Emissions Trading Directive.
- ⁽³⁾ The ETS share is calculated as verified emissions in 2005 divided by 2004 national greenhouse gas emissions.
- ⁽⁴⁾ The number of covered installations will be higher in 2007, as some installations were only opted out for 2005 and 2006.
- ⁽⁵⁾ Malta has not yet submitted its verified emissions. For the calculation of the share the total national allocation has been used. For Member States where verified emissions for more than 1 % of allocated allowances are missing the emissions for the outstanding installations have been estimated for the calculation of the share.
- ⁽⁶⁾ This figure comprises verified emissions of 793 installations. For a further 295 installations, which receive an annual average allocation of 3.284.285 allowances no verified emission figures were available at the time of writing this report.

Source: Community Independent Transaction Log (CITL); first national allocations plans of Member States; EC 2005e.

9 Effects of domestic sectoral policies and measures in the EU

9.1 Overview of national and common EU policies and measures



Many of the existing domestic policies and measures are based on EU common coordinated policies and measures (CCPMs). In some countries, national policies and measures had already been in force before CCPMs were adopted. In some other countries, national policies and measures were reinforced by CCPMs. The European Commission, through the second phase of the European Climate Change Programme, is expected to propose additional domestic policies and measures to contribute to meeting the EU Kyoto target.

In June 2001, the European Commission reported on a coordinated programme — the European climate change programme (ECCP) — in which it identified a number of EU-wide common and coordinated policies and measures (CCPMs). The large majority of policies and measures identified by the Commission as a priority for the EU from ECCP I have now been implemented. The Commission launched ECCP II with a stakeholder conference in October 2005 in Brussels. The conference was attended by over 450 delegates representing a broad spectrum of stakeholders. The focus for ECCP II is energy efficiency, renewable energy, the transport sector, carbon capture and storage, and the role of the EU in reducing vulnerability and promoting adaptation. ECCP II working groups met in 2006 and some proposals from the Commission are expected in 2006.

A number of the CCPMs have been adopted or are at an advanced stage of preparation. Many are included in the Member States' reporting on policies and measures. In several Member States similar national policies and measures were already in place. EU-wide policies and measures enhance these. Furthermore, many Member States have specific national policies and measures in place, which are not directly related to the EU-wide common and coordinated policies and measures. These national policies and measures are presented in detail in the annex.

A summary is provided for the most important common and coordinated policies and measures. They have already been agreed, but most of them

will only start to deliver substantial emission reductions in future years.

Energy supply and use (energy industries, industry and households):

- EU CO₂ emissions trading scheme (Directive 2003/87/EC, adopted by the Council and the Parliament in October 2003, started 1 January 2005)
- Directive linking the EU CO₂ emissions trading scheme with the Kyoto mechanisms (COM (2003) 403 final, adopted by the Council and the Parliament in October 2003 implemented by Member States)
- Directive on the promotion of electricity from renewable energy sources (2001/77/EC, adopted by Council and Parliament in 2001)
- Directive on Combined Heat and Power to promote high efficiency cogeneration (2004/8/EC, adopted by Council and Parliament in February 2004, not yet fully implemented by all Member States)
- Directive on the Energy Performance of Buildings (2002/91/EC, adopted by Council and Parliament January 2003 transposed by Member States in 2006)
- Directive restructuring the Community framework for the taxation of energy products and electricity (2003/96/EC, adopted by Council

October 2003, transposed by Member States in 2005)

- Directive on establishing a framework for the setting of ecodesign requirements for energy-using products (2005/32, adopted by Council and Parliament July 2005, to be transposed by Member States by 2007)

Transport:

- Reduction in the average CO₂ emissions of new passenger cars (voluntary commitment by car manufacturers in EU, Japan and Korea; 1998/1999)
- Directive on use of biofuels in transport (2003/30/EC, adopted by Council and Parliament May 2003, transposed by Member States in 2005)

Agriculture:

- Common rules for direct support schemes under the common agricultural policy and establishing certain support schemes for farmers (carbon credit for energy crops) (Regulation 1782/2003)

Waste management:

- Recovery of methane from biodegradable waste in landfills (Landfill Directive 1999/31/EC, transposed by Member States July 2001)

In addition to the aforementioned directives, the Energy Efficiency and Energy Services Directive 2006/32/EC was introduced in 2006, but no data is available yet on the implementation in Member States. Further proposals are currently under development targeting infrastructure use and charging in transport, and emissions reductions of certain fluorinated gases.

The Emissions Trading Directive (see also Chapter 8) created a market for CO₂ allowances and encourages emission reductions to take place where they are most economically efficient. The linking of the EU emissions trading scheme to the Kyoto mechanisms aims to reduce costs for those companies participating, promote the transfer of environmentally sound technology to countries with economies in transition (e.g. Russia) and developing countries.

There is a strong link between national policies and measures (PAM) and EU common and coordinated policies and measures (CCPMs). CCPMs demonstrate the collective determination

of the EU-25 to take action on climate change and they help to deal with competitiveness concerns of Member States. The implementation of CCPMs at a national level is described and its consequences on existing or new national policy are shown.

Member States supplied information reported on their CCPMs by returning a questionnaire from the European Commission. The questionnaire required Member States to report on the linkages of national policies and measures to CCPMs using the three categories:

- new national policies and measures implemented after a CCPM was adopted;
- national policies and measures already in force but re-enforced by a CCPM;
- national policies and measures already in force before a CCPM was adopted.

In addition, Member States were asked to provide the name of national policies and measures which implemented the CCPM and the quantitative effect on emission reduction of the measures. This process aimed to improve the transparency of national policy making. Only a limited number of Member States quantified emission savings, so the overall effects of CCPMs could not be assessed. Good quality information was provided on the linkages of national policies and measures to CCPMs. This is summarised in the matrix below. Fourteen Member States of the EU-15 provided information on policy linkages.

Based on responses by the EU-15, the most important CCPMs are:

- the promotion of electricity from renewable energy sources;
- the Emissions Trading Directive;
- the Landfill Directive;
- the Biofuels Directive.

All reporting Member States are implementing these CCPMs. The Emissions Trading Directive caused new national measures to be imposed in all Member States with virtually no Member State having similar schemes before this CCPM was introduced. The EU-15 was most active in promoting electricity generation from renewables before the corresponding directive was introduced. Many Member States either took sufficient action before

the directive or had existing measures re-enforced by the directive.

The Landfill Directive built on or reinforced national policies and measures in many Member States. The Biofuels Directive is a new policy in most Member States, but reinforced existing national policies in France, Germany and Sweden.

For the new Member States, Latvia and Slovenia supplied information on their CCPM linkages. Slovenia had implemented at least 10 CCPMs and

Latvia reported that they had implemented 14 out of a total of 16 CCPMs. In the majority of cases for both countries, new national policies and measures were implemented after a CCPM was adopted. The remaining eight Member States either did not submit information on their CCPMs or an English translation of the document. Transfer of good practice and CCPM implementation experience between old and new Member States will help to facilitate implementation of CCPMs in the new Member States.

Table 9.1 Linkages between CCPMs and national policies and measures of the EU-15

CCPM	Austria	Belgium	Denmark	Finland	France	*Germany	Greece	Ireland	Italy	Netherlands	Portugal	Spain	Sweden	United Kingdom
Taxation of energy products 2003/96/EC	N	N	B	B	B	B		B	R	B	N		R	B
Emissions trading 2003/87/EC	N	N	N	N	N	N	N	N	N	N	N	N	N	R
Promotion of electricity from RE sources 2001/77/EC	N	N	B	R	R	B	R	R	N	R	R	R	B	N
Promotion of cogeneration 2004/8/EC		B	R	R	B	B	R	N	N	B	B		B	N
Directives on energy labelling of appliances	N	N	B	N	N	N	N	N	R	N	N	N	N	N
Motor challenge, voluntary EC programme			N			R		N		N			N	
Energy performance of buildings 2002/91/EC	N	N	R	B	N	R	R	N	N	B	R	R	N	N
Eco-management & audit scheme (EMAS) EC 761/2001	N	N	N	N	N	N	R			B	N	N	B	
Efficiency of hot water boilers 92/42/EEC	N	N	B		N	R	B	N		B	N	N	N	N
Transport modal shift to rail 2001/12/EC etc.	N	N	R	N	B			N	N	B		N	R	N
Promotion of biofuels for transport 2003/30/EC	N	N	N	N	R	R	N	N	N	N	N	N	R	N
Consumer information on cars 1999/94/EC	N	N	R		N	N		N		N	N	N	N	N
Agreement with car manufacturers ACEA etc.	N	N			R	R	R		B	N	N		N	R
Support under CAP (1782/2003)	N	B	N	N	R	N		N		N		N	N	N
Support under CAP – amendment (1783/2003)		B	N	N	R			N		N			N	N
Landfill Directive 1999/31/EC	B	B	B	B	B	B	R	N	N	B	N	R	B	N

New National PAM implemented after CCPM was adopted

N

Existing National PAM *re-enforced* by CCPM

R

National PAM already in force *before* CCPM was adopted





B

Not reported

Note: *Germany's CCPM status is preliminary – they are yet to submit the descriptions of policies implementing the CCPMs. Several Member States did not report projections for all sectors/scenarios.

Source: EEA.

9.2 Sectoral EU-15 ⁽³²⁾ emission trends and projections

-  From 1990 to 2004, EU-15 greenhouse gas emissions decreased in most sectors, especially in waste management, industrial processes and agriculture. Energy supply and use, excluding transport, saw lesser reductions taking place.
-  EU-15 greenhouse gas emissions from transport increased by 26 % in the same period. They are projected to increase further to 35 % above 1990 levels by 2010 if only existing policies and measures are used.
-  EU-15 greenhouse gas emissions from energy supply and use, excluding transport, were 2.4 % below 1990 levels in 2004. They are projected to stay at roughly the same level by 2010 (2 % below 1990) if only existing policies and measures are used.
-  EU-15 greenhouse gas emissions in most sectors are projected to decline further by 2010 compared to 2004 levels if additional domestic policies and measures are used. At best, emissions from transport and industrial processes are projected to roughly stabilise at 2004 levels.

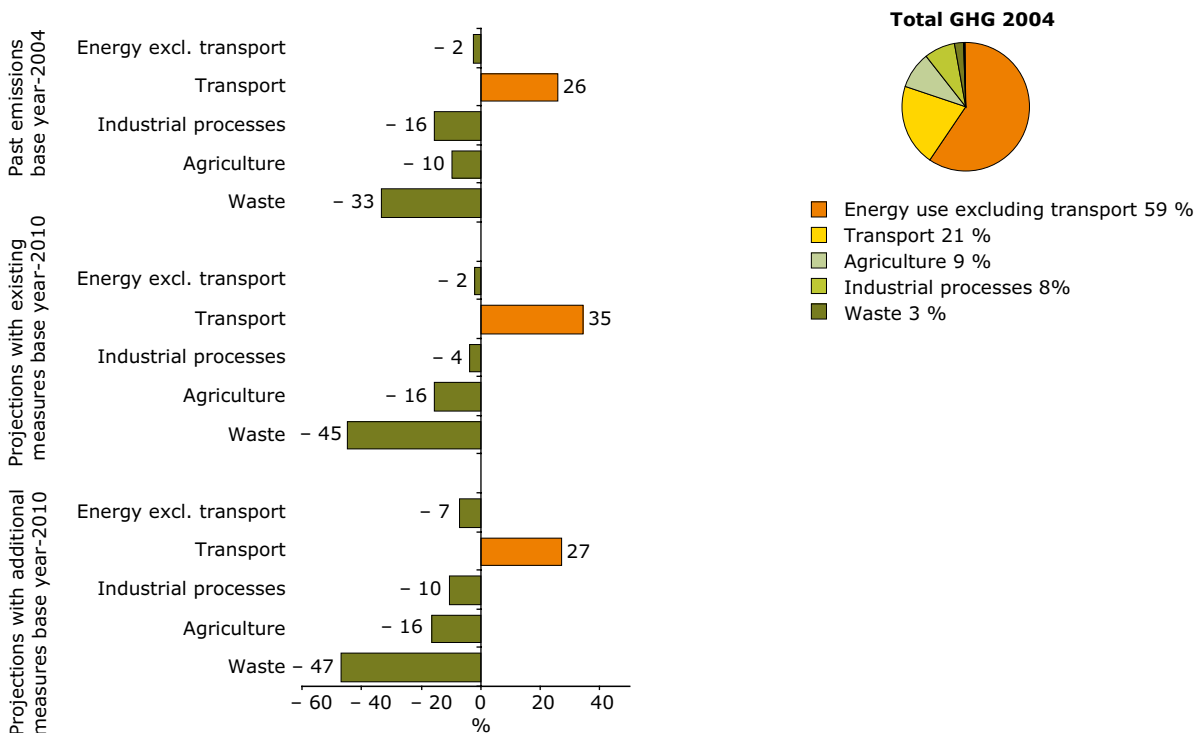
For the EU-15 the emission shares and changes for the main sectors are presented in Figure 9.1.

The most important gases and main emission sources are:

- energy supply and use, excluding transport: CO₂ from fossil fuel combustion in electricity and heat production, refineries, manufacturing industries, households and services;
- transport: CO₂ from fossil fuel combustion, but also N₂O from catalytic converters;
- agriculture: CH₄ from enteric fermentation and manure management, and N₂O from soils and manure management;
- industrial processes: CO₂ from cement production, N₂O from chemical industry, HFCs from replacing CFCs in cooling appliances and from production of thermal insulation foams;
- waste management: CH₄ from waste disposal sites.

⁽³²⁾ This chapter focuses on EU-15 unless stated otherwise (e.g. the section on renewable energy analyses and presents information on EU-25).





Figure 9.1 Changes in EU-15 greenhouse gas emissions by sector and shares of sectors



Note: Several Member States did not report projections for all sectors/scenarios. Therefore, the information on the total EU-15 projections is not complete and has to be interpreted with care.

Source: EEA.

Energy supply and use, excluding transport

-  Between 1990 and 2004, CO₂ emissions from public electricity and heat production increased by 6 % due to an increase of 35 % in electricity production in thermal power plants.
-  All Member States, at least to some extent, decoupled greenhouse gas emissions from energy consumption.
-  On current trends, the indicative 2010 targets for the share of renewable energies for the EU-15 (22.1 % of total electricity consumption) and the EU-25 (21% of total electricity consumption) are unlikely to be met. In order to meet the targets large increases in renewable energy are required.
-  CO₂ emissions from households increased by 3 % from 1990 to 2004, while the number of dwellings increased by 12 % from 1990 to 2000. Thus, decoupling was evident.

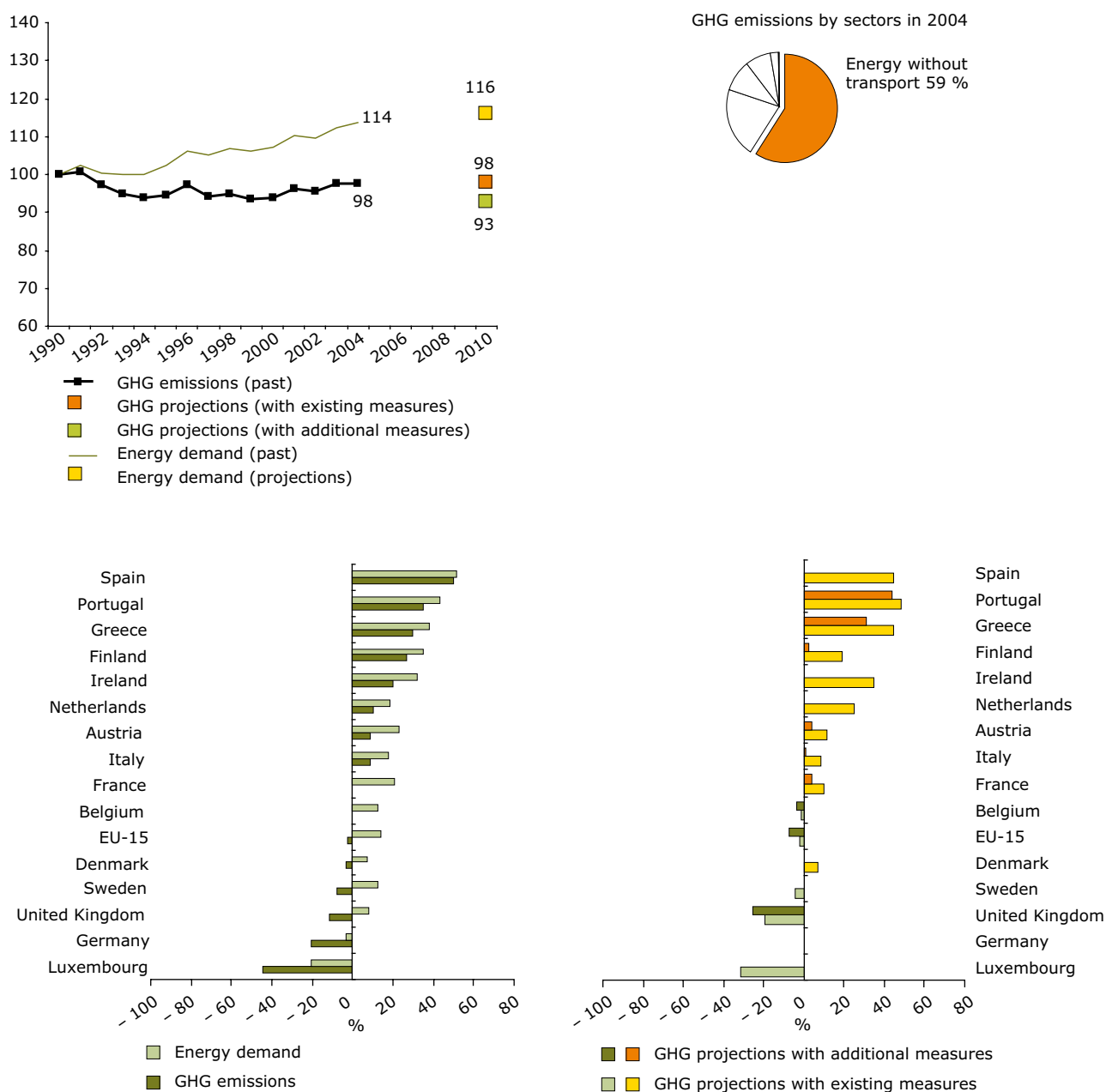
The main sectors covered by energy supply and use, excluding transport, are public electricity and heat production, refineries, manufacturing industries and households. From 2003 to 2004, emissions in the EU-15 increased by more than 2 %. During the period from 1990 to 2004, the rise in energy demand exceeded the increase in emissions in all EU-15 Member States. Sweden, France and the United

Kingdom were most successful at accomplishing such decoupling of emission levels and energy demand. By 2004, greenhouse gas emissions were 2.4 % lower than in 1990 while energy demand increased by 14 % in the same period (Figure 9.2). Five Member States achieved emission reductions between 1990 and 2004 (Germany, Luxembourg, Sweden, the United Kingdom and Denmark (Figure 9.2)), while the rise

in emissions was greatest in Spain, Portugal, Greece and Finland. The decline of related greenhouse gas emissions in the early 1990s was primarily the result of reductions in Germany (due to efficiency improvements in electricity and heat production, and restructuring of the industry after reunification, see Annex 8.1) and the United Kingdom (due to fuel switch in electricity and heat production).

With existing measures, emissions from energy use without transport are projected to stabilise at 2004 levels. Estimates based on sectoral projections from fourteen countries suggest that with additional measures the EU-15 emissions could be reduced to 7 % below 1990 level. The projected energy demand also shows that decoupling of emissions level and energy demand will continue.

Figure 9.2 EU-15 greenhouse gas emissions from energy supply and use (excluding transport) compared with energy demand



Note: Since sectoral emission projections for Germany were not available, GHG projections for the EU-15 are calculated on the basis of projections reported by 14 Member States. The 2004–2010 percent variation for the EU-14 was applied to Germany to obtain an EU-15 projection for 2010. No additional measures were reported for Denmark, Ireland, Luxembourg, Spain and Sweden. For these countries, the 'with existing measures' projections were used for the calculation of the EU-15 'additional measures' projections.

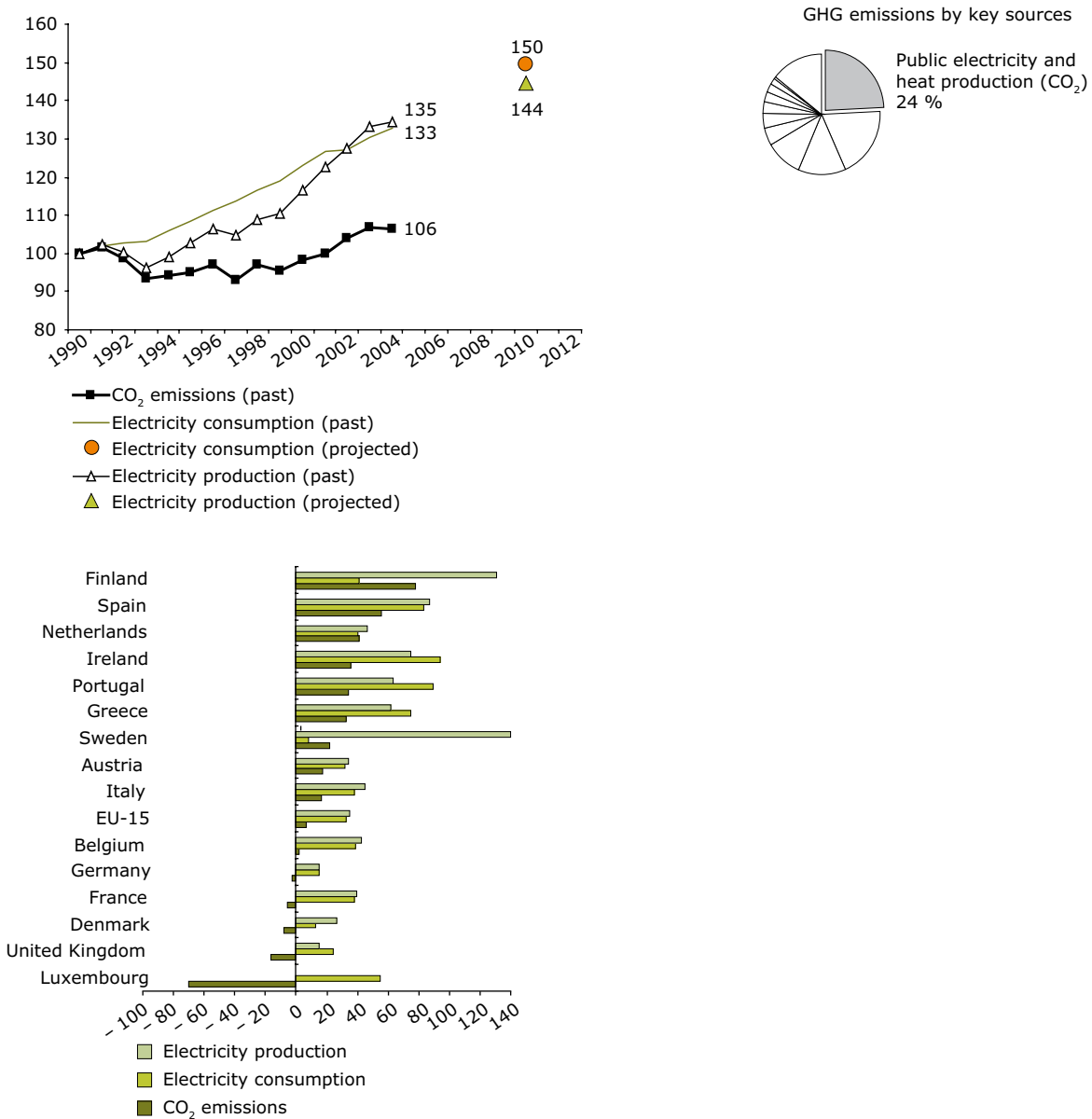
Source: EEA; Eurostat.

Public electricity and heat production

On the supply side public electricity and heat production is the most important source of greenhouse gas emissions (24 % of overall EU-15 emissions in 2004), mainly CO₂. Increasing CO₂ emissions in recent years have more than offset

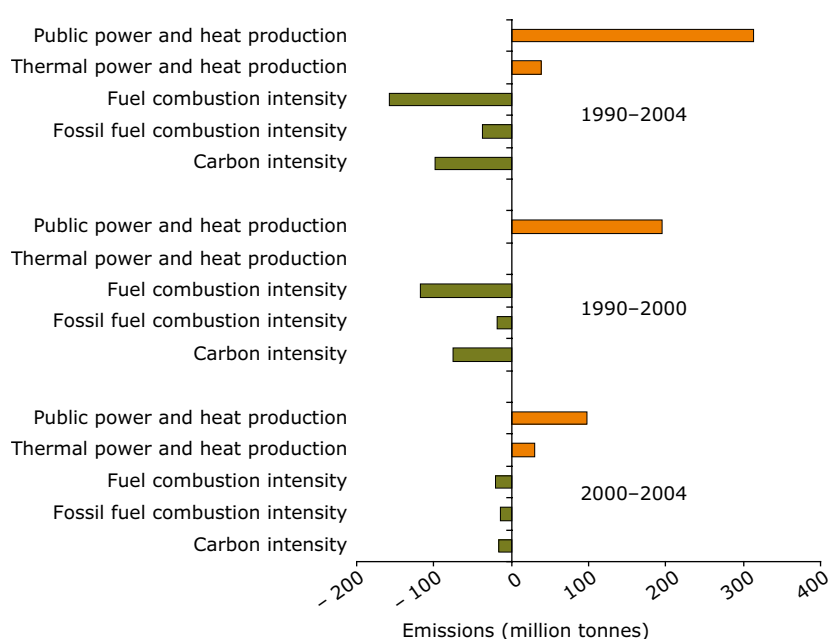
an 8 % reduction achieved in the early 1990s and resulted in emissions being 6 % above 1990 levels in 2004 (Figure 9.3). The carbon intensity and fuel combustion intensity have significantly decreased since 1990. Most of the reductions in fuel combustion intensity and carbon intensity were achieved in the 1990s (Figure 9.4).

Figure 9.3 EU-15 CO₂ emissions from public electricity and heat production compared with electricity production in thermal power plants and final electricity consumption



Source: EEA; Eurostat.

Figure 9.4 Decomposition analysis of the main factors influencing the CO₂ emissions from public electricity and heat production between 1990 and 2004



Note: The orange bars show the factors that have an increasing effect on emissions whereas the green bars show the factors that have a reduction effect. Aggregating both effects provides the actual emission changes.

Fuel combustion intensity describes the effect resulting from a change in the amount of fuel used in public power plants.

Fossil fuel combustion intensity describes the effect resulting from a change in the amount of fossil fuels used in public power plants (e.g. increased use of biomass).

Carbon intensity describes the effect resulting from a change to less carbon intensive fossil fuels in public power plants (e.g. shift from coal to oil or gas).

Source: EEA; Eurostat.

Renewable energy

The increase in renewable energy use has great potential for the reduction of CO₂ emissions from the energy sector. Following on from the White Paper on renewable sources of energy (RES), the Directive 2001/77/EC on the promotion of electricity from renewable energy sources in the internal electricity market sets:

- a global indicative target of 12 % of gross domestic energy consumption from renewables by 2010;
- an indicative share of 22.1 % of electricity produced from renewable energy sources in total EU-15 electricity consumption by 2010 (21 % for the EU-25), with individual indicative targets for all Member States (Figure 9.5).

The share of renewable energy (wind energy, solar energy, biomass, hydropower and waste) in

the EU-25's electricity consumption grew slightly from 12.2 % to 13.7 % between 1990 and 2004. For the EU-15 the share of renewable energy grew at a similar rate, from 13.4 % to 14.7 %. In the new Member States, a slight drop from 5.6 % to 4.3 % was observed in the share of renewable energy in electricity consumption between 2002 and 2003. After 2003, the share rose to 5.7 %. These jumps of 1.4 % in the EU-10 and 1 % in the EU-15 are due to growth in energy generation from wind, biomass and waste. For the EU-25, nineteen Member States increased their share of total renewable energy sources in electricity production between 2003 and 2004, whereas only six Member States witnessed increases between 2002 and 2003.

In 2004 the three largest users of renewables for their national electricity consumption in the EU-25 were Austria, Latvia and Sweden, with shares of about 59 %, 47 % and 46 %, respectively. Latvia's share of renewable energy in electricity consumption grew most, rising from 35 % in 2003 to 47 % in 2004.

Finland, Slovenia and Sweden also saw significant jumps in excess of 6 %. This trend lies in contrast to that of Portugal which saw a 12 % drop in the share of renewable energy production. However, Portugal's renewable energy share has been variable throughout the past 10 years with a high of 44.3 % in 1996 and a low of 17.6 % in 1992. These fluctuations are often due to the strong oscillations in hydroelectric production caused by annual variations in precipitation. Of the new Member States, Latvia, Slovenia and Slovakia had the highest share of electricity from renewable sources in 2004.

The increase in wind power production (increasing by a factor of 75 in the EU-15 during the period 1990–2004) was driven mostly by Germany and Spain, where policies and measures including 'feed-in' arrangements that guarantee a fixed favourable price for renewable electricity producers are used. Wind generation has also seen rapid growth in the new Member States, with generation increasing threefold in just a few years (2002 to 2004).

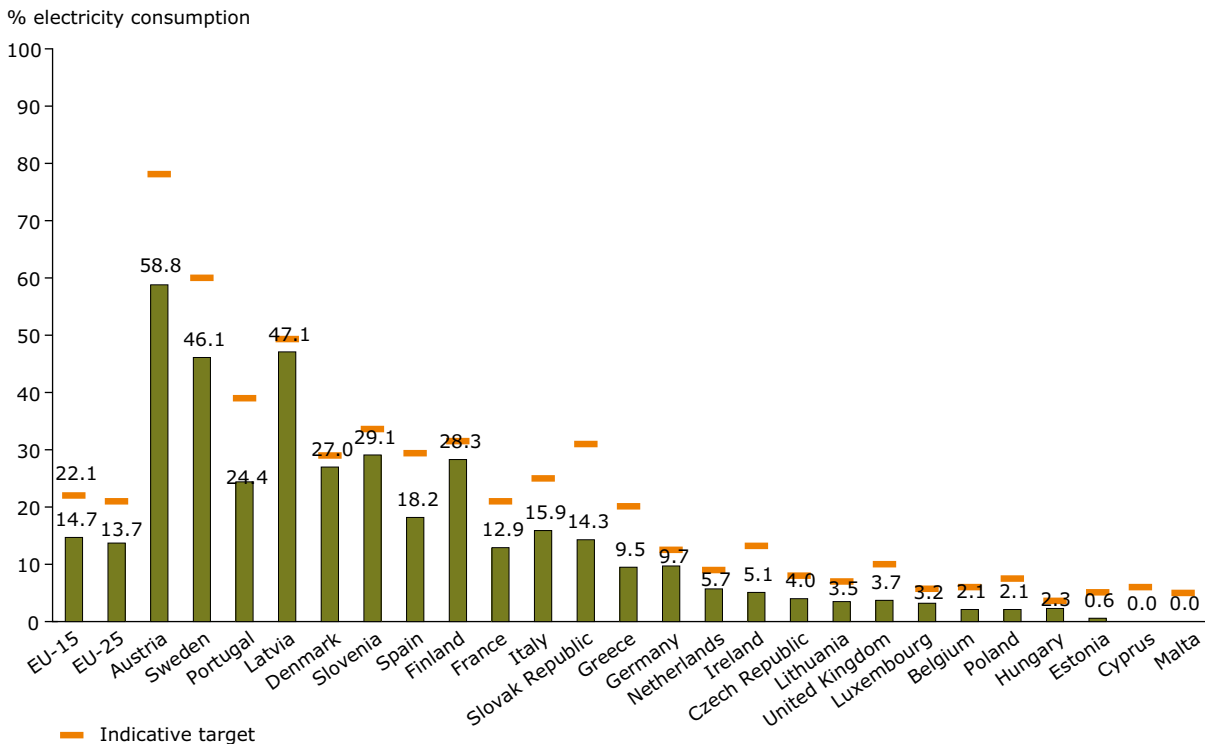
Solar (photovoltaic) electricity increases have been driven by Germany and Spain, mainly as a result of a combination of 'feed-in' arrangements and

high subsidies. In these countries, consumption of photovoltaic electricity continues to grow at an unprecedented rate (e.g. growth of 67 % in Germany and 148 % in Spain between 2003 and 2004).

Energy production from biomass/waste resources has also expanded rapidly for both the EU-15 and the new Member States. In absolute values, the amount of electricity produced from wood/waste was highest in France, Germany and Sweden, for 2004. These countries provided considerable research and development support as well as subsidies to the biomass power industry. In Sweden, the introduction of CO₂ and energy taxes from which biomass is exempt also helped the expansion of biomass power plants.

The EU-15 and EU-25 targets are unlikely to be met under current trends because renewable electricity is dominated by large hydropower (64 % share of output for the EU-25 in 2003, compared to biomass/waste 15 % and wind power 11 %). Hydropower is not projected to increase substantially because of concerns about its impact on the environment, i.e. through the loss of land and resulting destruction of natural habitats and ecosystems. Therefore, to meet

Figure 9.5 Share of renewable energy sources in electricity consumption in 2004 and targets for 2010 for the EU-25



Note: National indicative targets shown are reference values that Member States agreed to take into account when setting their indicative targets by October 2003, according to the EU Renewable Electricity Directive.

Source: Eurostat.

the targets large increases in other renewables are required.

Additional policies and measures to support the further expansion of the use of renewables include the EU Directive on the use of biofuels in transport.

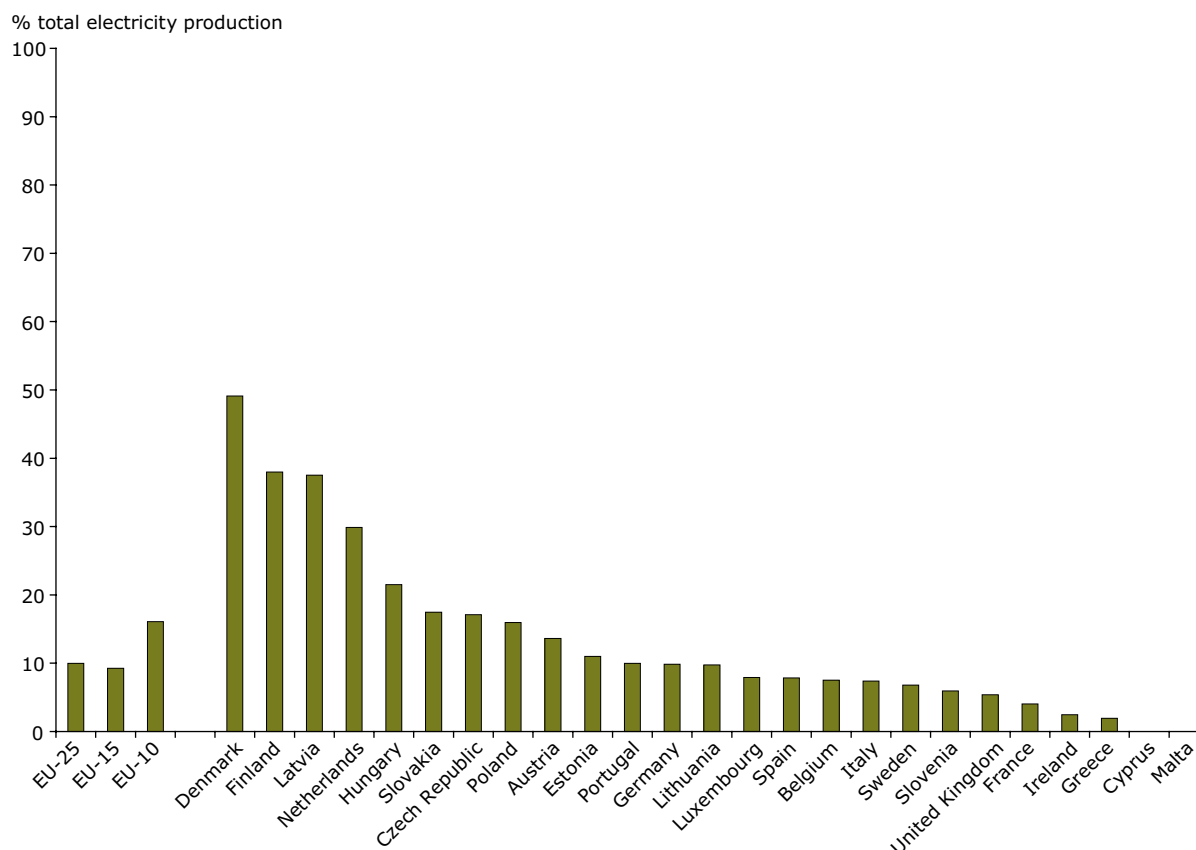
Regarding all policies and measures for the promotion of renewables, Austria and Greece have reported additional domestic policies and measures. Renewable policies and measures have been assessed quantitatively by the majority of the EU-15 countries. Additional measures provide a reduction potential of 10.1 Mt CO₂-equivalents and more significantly, existing policies and measures contribute approximately 62.5 Mt CO₂-equivalents in the Kyoto commitment period. Germany has amended its 'Renewable energy act' ⁽³³⁾ in order to achieve its 12.5 % target for the share of renewables in electricity consumption under the EU indicative target mentioned above.

Combined heat and power

Combined heat and power (CHP) technology uses fossil fuels, biomass or waste to supply end-users with heat as well as electricity. In doing so, it avoids much of the waste heat losses associated with normal electricity production: CHP can utilise over 85 % of the energy in the fuel whereas current condensing power plants producing only electricity use an average of approximately 35–45 %. CHP schemes are particularly effective for large, dense heat loads for long periods of the year, such as those provided by collective housing schemes in relatively cold climates. The heat generated may also be well suited for use in some industrial processes.

In the EU-15, the share of CHP generation in gross electricity production decreased from 10 % in 2000 to approximately 9 % in 2002. This data includes electricity generated from public supply and autoproducers. This apparent decline can be partly

Figure 9.6 EU-15 shares of combined heat and power in gross electricity production in 2002



Note: The share is defined as the proportion of CHP electricity production (from both private and public utilities) in total electricity production. However, it should be noted that not all electricity production from a CHP 'plant' may be considered as CHP production as the plant may consist of different types of units (such as condensing turbines or flexible units where the power-to-heat ratio may be adjusted).

Source: Eurostat.

⁽³³⁾ Decision of Federal Council of Germany, 9 July 2004, www.bmu.de/de/1024/js/sachthemen/erneuerbar/eeg_nov

explained by a first change in the methodology used by Eurostat to calculate the share of CHP in gross electricity production in 2000 and a subsequent change in 2002. These revisions have resulted in lower figures for some countries. Therefore, the current share is not directly comparable to the 18 % target outlined in 1997 by the European Commission (COM(97)514 final).

In 2002, countries with the highest percentage of CHP electricity generation were Denmark, Finland, the Netherlands, and Austria (Figure 9.6). High market penetration of CHP electricity in Denmark was achieved as a result of strong government policy support via tax incentives and subsidies. Government support was also an important factor in Austria and the Netherlands. In Finland, the liberalisation of energy markets and the execution of energy policies stimulated investment in CHP. In recent years, however, the growth of CHP has slowed in many Member States, in particular Germany, the Netherlands and the United Kingdom. This is due for the most part to a decrease in electricity prices which has occurred with the liberalisation of the electricity market.

The CHP Directive on the promotion of cogeneration 2004/8/EC entered into force in 2004 and Member States were expected to transpose the directive by February 2006. The directive encourages Member States to promote CHP up-take and help to overcome the current barriers hindering progress. The directive does not include a target. Instead, it

requires Member States to carry out analyses of their potential for high efficiency cogeneration, and evaluate and report progress towards increasing the share of high efficiency cogeneration.

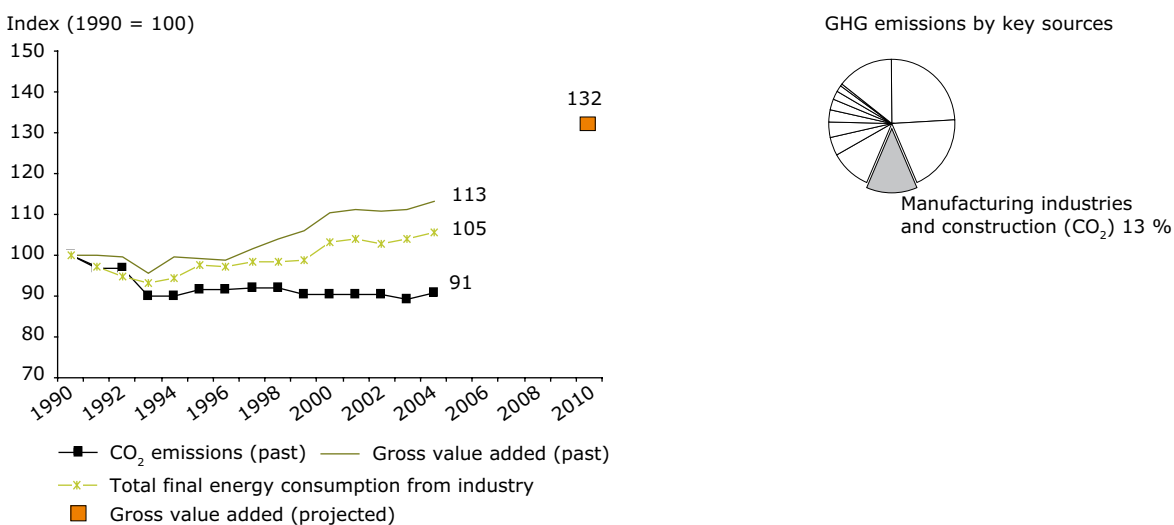
Barriers experienced in recent years to CHP development are due to:

- rising natural gas prices and falling electricity prices, which have reduced the cost competitiveness of CHP (gas is the preferred fuel for new CHP);
- uncertainty over the evolution of electricity markets. Companies are becoming reluctant to invest in CHP as liberalisation is progressively extended;
- large over-capacities for electricity production in Europe leading to a very competitive market which drives electricity prices down. This strategy has been used by electricity utilities to protect their markets.

Manufacturing industries

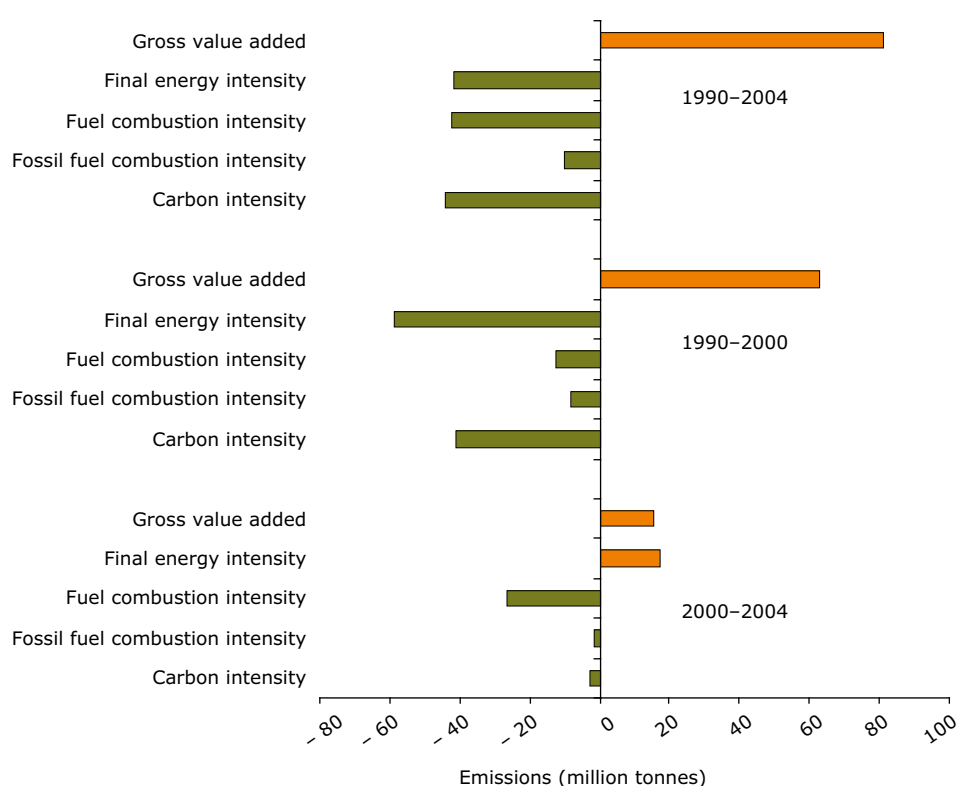
Energy use in manufacturing industries consists of fossil fuel combustion for heat and electricity produced for own use. CO₂ emissions from fossil fuel combustion fell by 9 % between 1990 and 2004 (Figure 9.7), representing a 13 % share of total EU-15 greenhouse gas emissions. Most emission reductions were already achieved by 1993. Reductions were

Figure 9.7 EU-15 CO₂ emissions from manufacturing industries and construction 1990–2004 compared with value added and energy consumption and share in total GHG emissions



Source: EEA, 2006; Eurostat; European Commission, 2006.

Figure 9.8 Decomposition analysis of the main factors influencing the development of EU-15 CO₂ emissions from manufacturing industries and construction between 1990 and 2004



Note: The orange bars show the factors that have an increasing effect on emissions whereas the green bars show the factors that have a reduction effect. Aggregating both effects provides the actual emission changes.

Final energy intensity describes the effect resulting from the change of final energy consumption per gross value added.

Fuel combustion intensity describes the effect resulting from a change in the amount of fuel used in public power plants.

Fossil fuel combustion intensity describes the effect resulting from a change in the amount of fossil fuels used in public power plants (e.g. increased use of biomass).

Carbon intensity describes the effect resulting from a change to less carbon intensive fossil fuels in public power plants (e.g. shift from coal to oil or gas).

Source: EEA, 2006; Eurostat.

mainly due to efficiency improvements and structural change in Germany after reunification and the relatively small economic growth in the EU-15. Additionally, a fuel shift from carbon intensive solid fuels to less carbon intensive gaseous fuels took place. Between 1990 and 2004, industrial output – the main driving force for emissions from the industry sector – in terms of gross value added increased by 13 %. However, energy related CO₂ emissions from iron and steel production increased by + 6.9 million tonnes between 2003 and 2004; making it one of the largest contributors to the 0.3 % increase in EU-15 greenhouse gases emissions.

Figure 9.8 shows that the decrease in final energy intensity, fuel combustion intensity and carbon

intensity contributed substantially to reduced CO₂ emissions and exceeded the emission increase due to rise in economic activity i.e. gross value added in this sector.

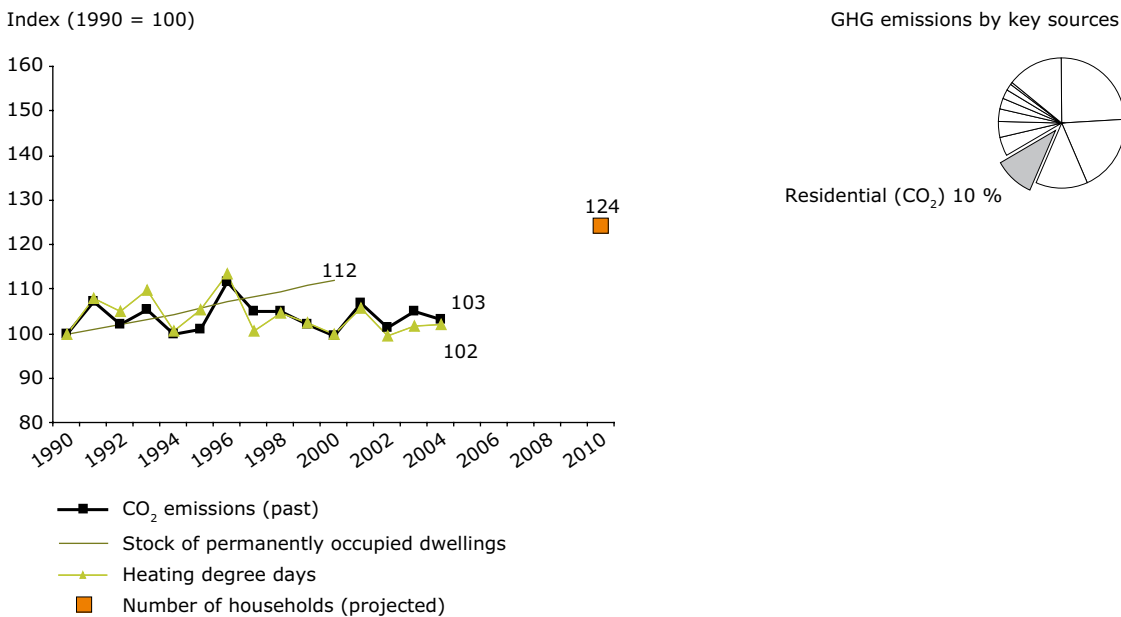
Households

CO₂ emissions from energy use in households accounted for 10 % of total EU-15 greenhouse gas emissions in 2004. From 1990 to 2004, emissions fluctuated mainly in line with outdoor temperature during the winter season, and exhibited an overall slightly increasing trend (Figure 9.9). The energy demand of the household sector is mainly driven by the number and size of dwellings, the standard of the building stock and the appliances for heating and

warm water production. Over the period 1990–2000 the number of households increased by 12 % while emissions grew only slightly. This decoupling of emissions from growth in households seen until 2000 resulted from energy efficiency improvement due to thermal insulation, fuel switching to natural gas and an increase in district heating. The decomposition analysis in Figure 9.10 shows that decreases in fuel combustion intensity and

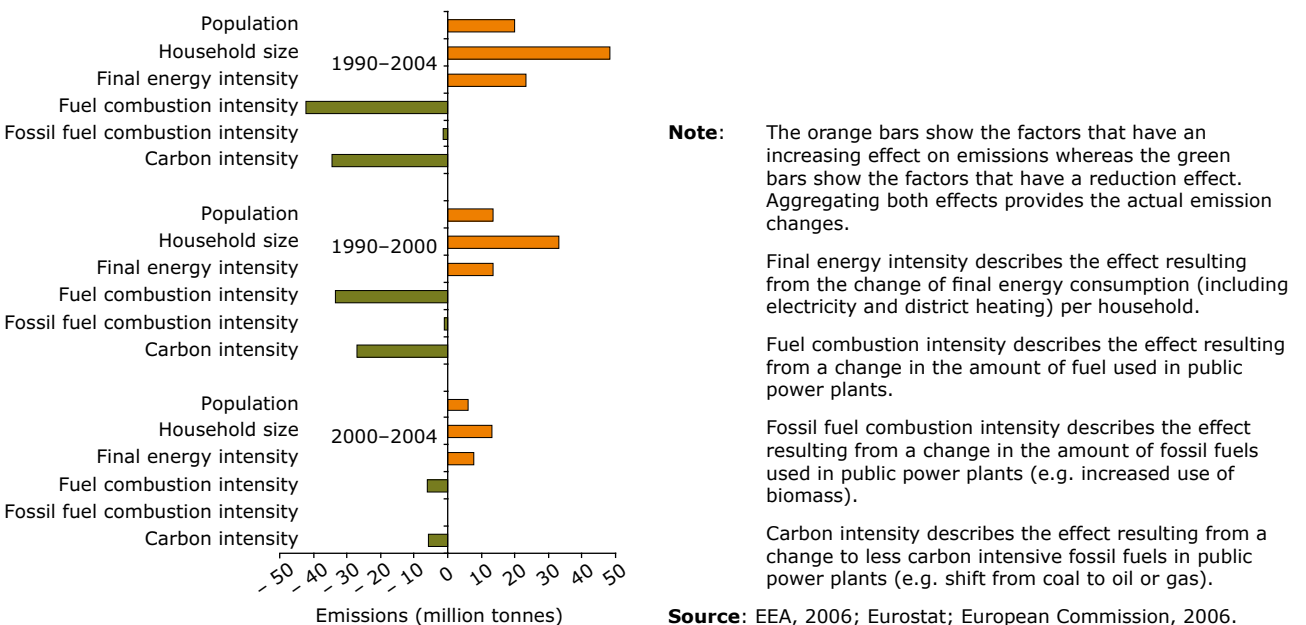
carbon intensity resulted in significant decreases of emissions. However, these decreases were more than offset by the increases in population, average household size and final energy intensity. It is worth noting that most of the decreases in fuel combustion intensity and carbon intensity were achieved in the 1990s, whereas population, household size and final energy intensity still continue to increase.

Figure 9.9 EU-15 CO₂ emissions from households compared with the number of permanently occupied dwellings, heating degree days and share of households in total GHG emissions







Source: EEA, 2006; Eurostat; European Commission, 2006.

Figure 9.10 Decomposition analysis of the main factors influencing the development of EU-15 CO₂ emissions from households between 1990 and 2004



Transport

-  Between 1990 and 2004, EU-15 greenhouse gas emissions from domestic transport increased by 26 %. Emissions from transport by road increased by 25 % over the same period.
-  For 2010, EU-15 greenhouse gas emissions from domestic transport are projected to increase by 35 % from 1990 levels if only existing domestic policies and measures ⁽³⁴⁾ are used.
-  The average carbon dioxide emissions of new passenger cars were reduced by about 12 % from 1995 to 2004. However, 21 % more cars were sold in the same period. As a result, this increase more than offset the emission reductions from new cars.
-  EU carbon dioxide emissions from international aviation and navigation (not addressed under the Kyoto Protocol) increased by 59 % between 1990 and 2004.

In 2004, greenhouse gas emissions from transport accounted for 21 % of total EU-15 emissions and are mostly due to carbon dioxide from fuel combustion; minor contributions derive from nitrous oxide and methane (from road transport).

The transport sector presented here consists of road transportation, national civil aviation, railways, national navigation and other transportation. It excludes emissions from international aviation and maritime transport (which are not covered by the Kyoto Protocol or EU policies and measures).

Transport caused the largest increase in greenhouse gas emissions between 1990 and 2004 (+ 26 %). Transport emissions in the EU-15 increased by 2 % between 2003 and 2004 alone. Road transport was by far the biggest transport emission source (93 % share). Emissions increased continuously due to high growth in both passenger transport (increase of 27 % between 1990 and 2004) and freight transport by road (increase of 51 % between 1990 and 2003) (Figure 9.11)

Compared to last year's report, emission projections for the transport sector show a higher increase. This is due mostly to revised figures from Spain. For 2010, the current EU-15 emissions increase is projected to continue to reach 35 % above 1990 levels with existing domestic policies and measures. Additional policies and measures are projected to limit the growth of emissions compared to 2004 levels to 28 % above 1990 levels.

Carbon dioxide emissions from international aviation and navigation are growing faster than

emissions from other transport modes. They show a combined increase of 59 % from 1990 to 2004. Emissions from international aviation are growing fastest; an increase of 86 % was witnessed in the same period. International aviation and navigation are not included in the reduction targets of the Kyoto Protocol.

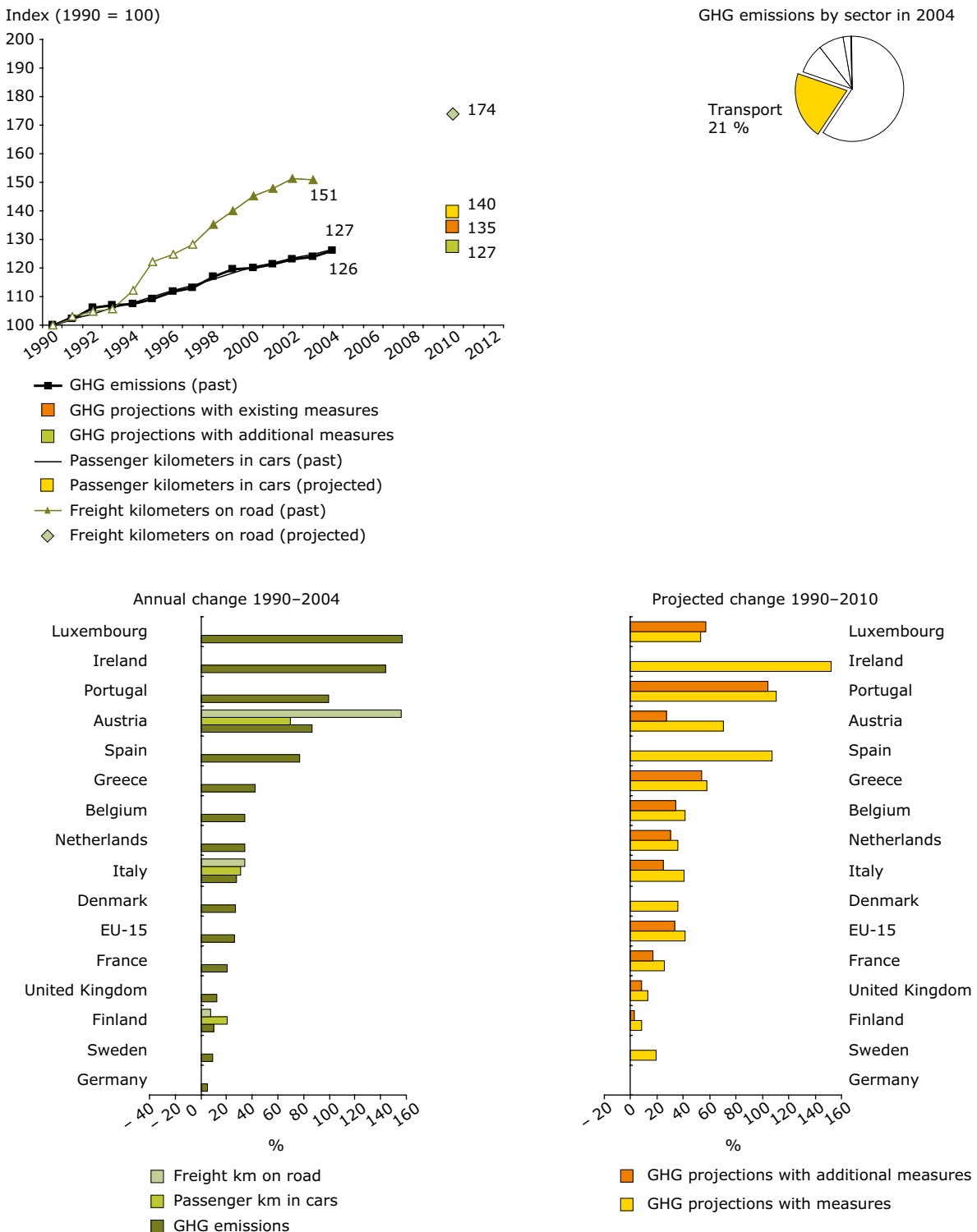
All reporting Member States project growing transport emissions. This indicates that existing policies and measures are not sufficient to decouple emissions from activity growth. Austria, Belgium, Italy and Portugal project additional policies and measures to significantly reduce the projected growth in transport emissions.

The projected increase of emissions from transport is mostly due to continued growth in transport volumes. This projections remain despite policies and measures aimed at achieving the EU objective of shifting traffic from road to rail and inland waterways.

A key instrument for reducing emissions from passenger cars is the voluntary commitment by the European, Japanese and Korean car industries to reduce average CO₂ emissions from new passenger cars; a target of 140 g/km for 2008 in the EU and 2009 in Japan and Korea has been set. These emissions were reduced between 1995 and 2004 by approximately 12 %, from 186 to 163 g/km (Figure 9.12). The main reasons for the reductions since 1995 are fuel efficiency improvements, mainly in diesel-fuelled vehicles, and a shift in fleet composition from petrol to diesel passenger cars.

⁽³⁴⁾ EU-15 greenhouse gas emission projections from transport are calculated on basis of projections reported by 14 Member States. Sectoral emission projections are missing for Germany.

Figure 9.11 EU-15 greenhouse gas emissions from transport compared with transport volumes (passenger transport by car and freight transport by road)



Note: Since sectoral emission projections are missing for Germany, GHG projections for the EU-15 are calculated on the basis of projections reported by 14 Member States. The 2004-2010 percent variation for the EU-14 was applied to Germany to obtain an EU-15 projection for 2010. No additional measures were reported for Denmark, Ireland, Luxembourg, Spain and Sweden. For these countries, the 'with existing measures' projections were used for the calculation of the EU-15 'additional measures' projections. Past sectoral emissions are complete.

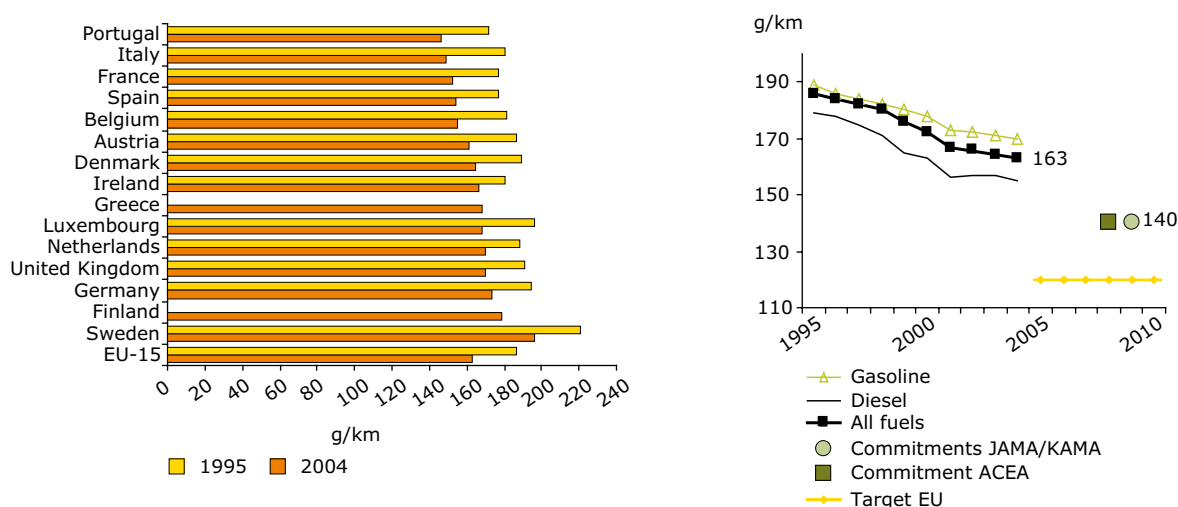
Source: EEA, Eurostat.

Diesel-fuelled cars are more energy efficient but emit more air pollutants than petrol-fuelled cars. The European Parliament and the Council have expressed an average emission target of 120 g CO₂/km by 2010.

In spite of more fuel efficient vehicles, the emissions from transport by road are likely to further increase due to the rise in traffic volumes.

The European Commission recently stressed that the concerted efforts by automobile manufacturers were insufficient to reach the goals set for new passenger cars for 2008–2009. Moreover, it added that additional efforts were absolutely essential in order to meet the final target of 140 g CO₂/km. In addition to efficiency improvements, efforts to limit the increase in traffic volumes as well as a shift to less CO₂ emitting transport modes are also required.

Figure 9.12 Average specific CO₂ emissions of new passenger cars per fuel type and targets



Note: The consistency of the time series 1995–2004 is not guaranteed. For the first time, in the European Commission's 2006 report, CO₂ monitoring data were used. These data were officially reported by countries to the European Commission for calculating the 2002 figures. For previous years, the car manufacturing associations provided the underlying data.

Source: European Commission, 2006.

Agriculture



EU-15 greenhouse gas emissions from agriculture fell by 10 % between 1990 and 2004.



Based on existing domestic policies and measures, EU-15 greenhouse gas emissions from agriculture are projected to decrease to 16 % below the 1990 level by 2010 ⁽³⁵⁾.

In 2004, greenhouse gas emissions from agriculture represented 9 % of total EU-15 emissions.

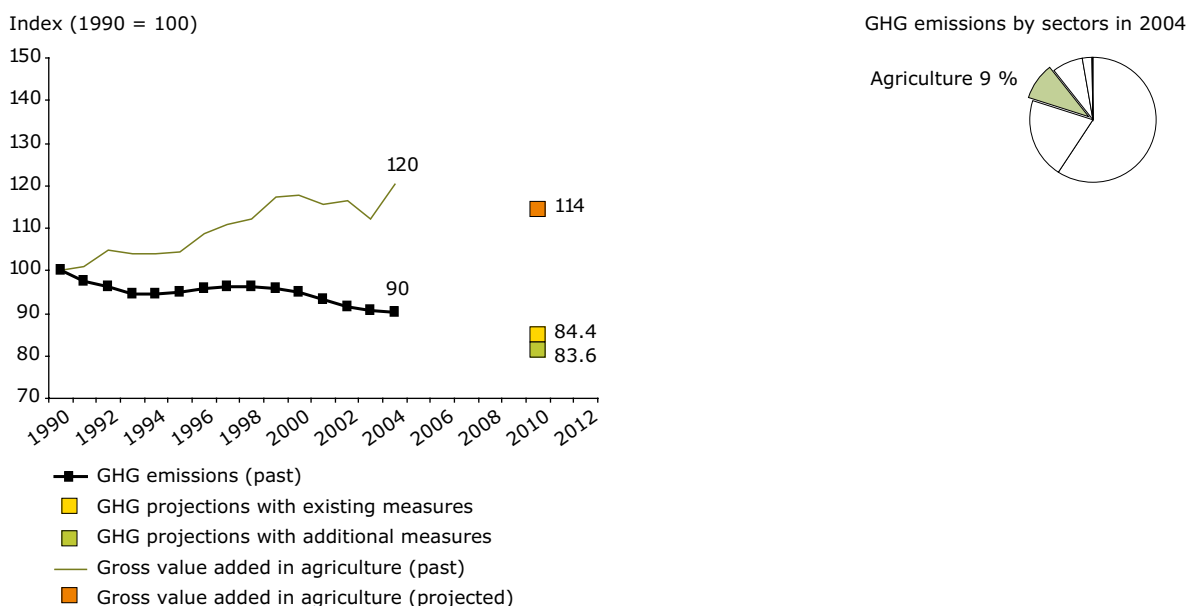
Between 1990 and 2004, nitrous oxide emissions from agricultural soils fell mainly due to a decrease in the use of nitrogen fertiliser and manure. This was to a large extent a consequence of efficiency improvements, the reform of the EU's common agricultural policy (CAP) as well as the

implementation of the Nitrates Directive aimed at reducing water pollution. Methane emissions from enteric fermentation (by cattle) also fell, primarily as a result of a drop in the number of cattle.

For 2010, emissions from agriculture are projected to decrease further (Figure 9.13). This is partly due to the continuing effect of the CAP reform and the Nitrates Directive.

⁽³⁵⁾ EU-15 greenhouse gas emission projections from agriculture are calculated on basis of projections reported by 12 Member States. Sectoral emission projections are missing for Germany, Luxembourg and Spain.

Figure 9.13 EU-15 past and projected greenhouse gas emissions from agriculture and gross value added



Note: Since sectoral emission projections are missing for Germany and Luxembourg, GHG projections for the EU-15 are calculated on the basis of projections reported by 13 Member States. The 2004–2010 percent variation for the EU-13 was applied to Germany and Luxembourg to obtain an EU-15 projection for 2010. No additional measures were reported for Denmark, Ireland, Spain and Sweden. For these countries, the 'with existing measures' projections were used for the calculation of the EU-15 'additional measures' projections.

Source: EEA, Eurostat.

Industry (non-energy related)

- ☹️ EU-15 greenhouse gas emissions from industrial processes (carbon dioxide, nitrous oxide and fluorinated gases) were reduced by 16 % compared to base-year levels. They are projected to rise again to 4 % below base-year levels with existing domestic policies and measures. With additional domestic measures, they would remain only slightly above 2004 levels ⁽³⁶⁾.
- 😊 EU-15 nitrous oxide emissions from chemical industries decreased by 55 % between 1990 and 2004.
- ☹️ EU-15 hydrofluorocarbon emissions from refrigeration and air conditioning (currently accounting for 1 % of total EU-15 greenhouse gas emissions) increased by a factor of nine between the base-year and 2004.

In 2004, industry (non-energy related) greenhouse gases emissions represented 8 % of total EU-15 emissions.

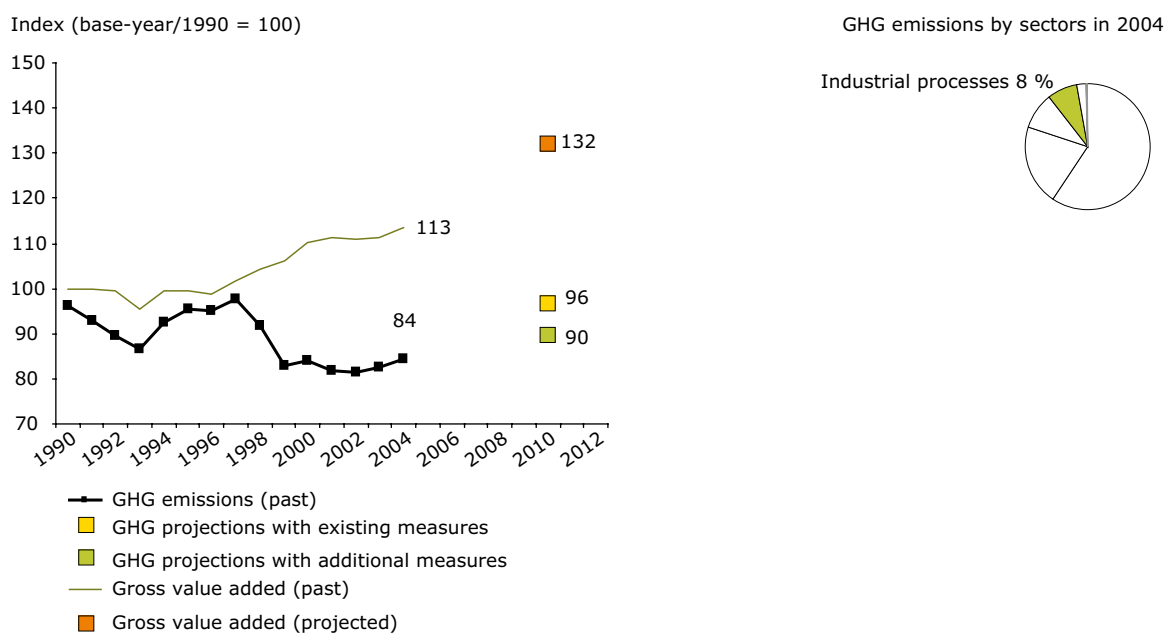
The trends in emissions in the 1990s show a reduction in carbon dioxide emissions from cement production. This was due to lower economic activity and increased imports in the early 1990s. There was also a reduction in nitrous oxide emissions because

of emission reduction measures in the adipic acid production industry in France, Germany and the United Kingdom. In addition, large reductions were achieved in the United Kingdom owing to reduction measures in hydrochlorofluorocarbon (HCFC) production between 1998 and 1999.

HFC emissions from consumption of halocarbons and SF₆ currently account for 1.0 % of total EU-15

⁽³⁶⁾ EU-15 greenhouse gas emission projections from industrial processes are calculated on the basis of projections reported by 12 Member States. Sectoral emission projections are missing for Germany, Luxembourg and Spain.

Figure 9.14 Non-energy related greenhouse gas emissions from industrial processes compared with the value added and energy consumption in the EU-15 1990–2004 and share in total GHG emissions



Note: Gross value added is the difference between output and intermediate consumption for any given sector/industry, i.e. the difference between the value of all newly generated goods and services, and the value of all goods and services consumed as intermediate consumption.

Since sectoral emission projections are missing for Germany and Luxembourg, GHG projections for the EU-15 are calculated on the basis of projections reported by 13 Member States. The 2004–2010 percent variation for the EU-13 was applied to Germany and Luxembourg to obtain an EU-15 projection for 2010. No additional measures were reported for Denmark, Ireland, Spain and Sweden. For these countries, the 'with existing measures' projections were used for the calculation of the EU-15 'additional measures' projections.

Source: EEA, Eurostat.

greenhouse gas emissions. However, they have grown substantially, as HFCs have been replacing ozone-depleting chlorofluorocarbons (CFCs), mainly in refrigeration and air conditioning, and as aerosol propellants and blowing agents for the production of thermal insulation foams. Between the base-year and 2004, EU-15 HFC emissions from consumption of halocarbons and SF₆ increased by a factor of nine. This was the highest increase in relative terms of all emission sources in the EU-15.

In 2004, emissions from cement production were above the 1990 level. Total greenhouse gas emissions from industrial processes (carbon dioxide, nitrous oxide and fluorinated gases) in 2004 were 16 % below base-year levels, while the gross value added in the industrial sector increased by 13 % between 1990 and 2004 (Figure 9.14).

For 2010, EU-15 emissions from industrial processes are projected to be 1 % below 1990 levels with

existing domestic policies and measures. The significant abatement of nitrous oxide emissions in the manufacture of adipic acid in a few Member States is to a large extent offset by increases in emissions of fluorinated gases. These gases are projected to increase by 94 % from the base-year to 2010 with existing policies and measures.

With additional domestic regulatory policies and measures planned by a few Member States, the greenhouse gas emissions from industrial processes are projected to be 11 % below base-year level in 2010. This corresponds to an increase of five percentage points in relation to 2004. Compared to last year's report, the emissions are 9 % higher in the 'with additional measures' projection. This is mostly due to adjustments in the projections from Spain and France.

Waste management



EU-15 methane emissions from landfills fell by 38 % between 1990 and 2004.



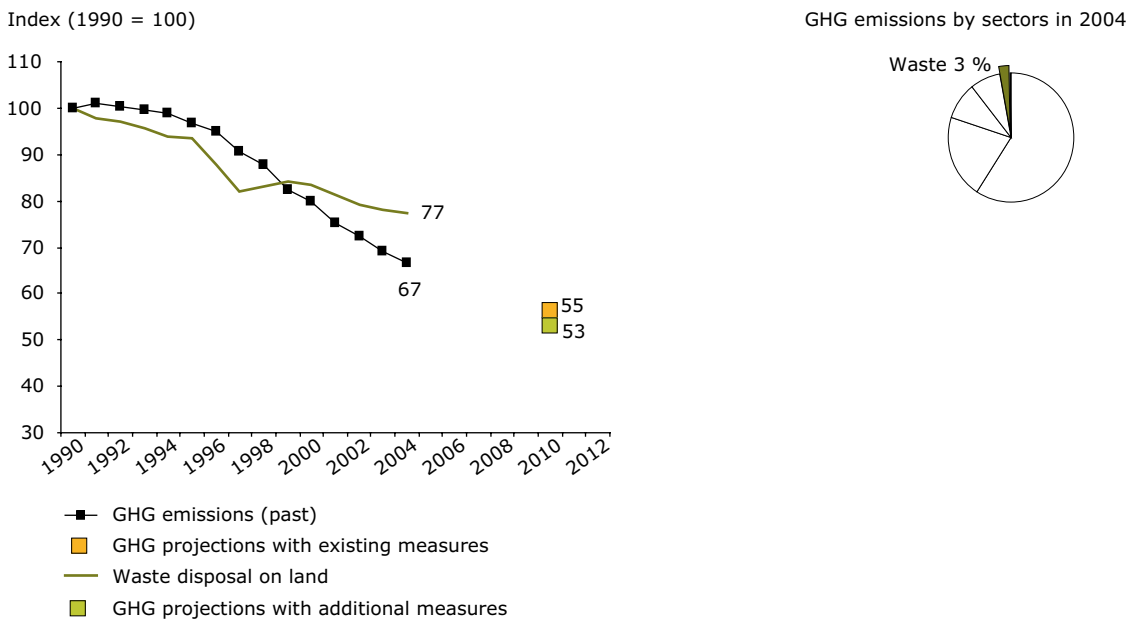
EU-15 greenhouse gas emissions from the waste sector are projected to be more than 40 % below 1990 levels by 2010 ⁽³⁷⁾.

In 2004, greenhouse gases emissions from waste management activities represented 2.6 % of total EU-15 emissions.

Since 1990, methane emissions from landfills have fallen. The decrease is mainly a result of the reduction in the amount of waste disposal on land and the installation of landfill gas recovery on all new sites (as required by the Landfill Directive).

With existing measures, EU-15 greenhouse gas emissions from the waste sector are projected to continue to decrease to 55 % of base-year level (Figure 9.14). This is mainly due to further implementation of the Landfill Directive. The implementation of additional measures would result in a further decrease by two percentage points.

Figure 9.15 EU-15 past and projected greenhouse gas emissions from waste



Note: Since sectoral emission projections are missing for Germany and Luxembourg, GHG projections for the EU-15 are calculated on the basis of projections reported by 13 Member States. The 2004–2010 percent variation for the EU-13 was applied to Germany and Luxembourg to obtain an EU-15 projection for 2010. No additional measures were reported for Denmark, Ireland, Spain and Sweden. For these countries, the 'with existing measures' projections were used for the calculation of the EU-15 'additional measures' projections.

Source: EEA.

⁽³⁷⁾ EU-15 greenhouse gas emission projections from waste management are calculated on basis of projections reported by twelve Member States. Sectoral emission projections are missing for Germany, Luxembourg and Spain.

10 Use of carbon sinks



The projected use of carbon sinks for achieving the EU-15 Kyoto target is relatively small. It is estimated that the CO₂ removal due to activities under Articles 3.3 and 3.4 of the Kyoto Protocol (carbon sinks) during the Kyoto commitment period will amount to 33 Mt CO₂ per year. This would approximately correspond to one tenth of the EU-15 target of – 8 %.

In addition to policies and measures targeting sources of greenhouse gas emissions (see Chapter 9), Member States can also use policies and measures to enhance CO₂ removals by land-use change and forestry activities (carbon sinks). These carbon sinks include mandatory activities covered by Article 3.3 of the Kyoto Protocol (afforestation, reforestation and deforestation) and voluntary activities under Article 3.4 (forest management, cropland management, grazing land management and revegetation).

Fourteen Member States have provided preliminary estimates of their intended use of carbon sinks under Article 3.3 to achieve their burden-sharing targets (Austria, Belgium, Czech Republic, Denmark, Finland, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Slovenia, Spain, Sweden and the United Kingdom). This limited information shows for the EU-15 that there are already plans to remove a net amount of about 18 million tonnes CO₂ per year through afforestation and reforestation by 2008–2012. This figure has decreased by around 13 Mt CO₂ per year since last year's estimate. This is mainly due to corrections made by Ireland and the United Kingdom. Additionally, Slovenia expects a net removal of approximately 0.4 million tonnes CO₂-equivalent per year.

By the end of 2006 all Parties to the Kyoto Protocol have to submit a report to the UNFCCC Secretariat determining their assigned amount. This includes the election of Article 3.4 activities. Therefore the available information on activities under Article 3.4 of the Kyoto Protocol has increased substantially since last year's report. Twelve Member States (Czech Republic, Denmark, France, Hungary, Italy, Lithuania, Poland, Portugal, Slovenia, Spain, Sweden and the United Kingdom) decided to account for forest





management under Article 3.4 while nine Member States (Austria, Belgium, Estonia, Finland, Ireland, Latvia, Luxembourg, the Netherlands and Slovakia) will not do so. The remaining two Member States remain undecided⁽³⁸⁾. As a result of this, additional reductions of GHG emissions from activities in forest management for the EU-15 are projected to be 14.2 million tonnes CO₂ per year. Portugal is the only Member State that provided a quantitative estimate for activities in cropland and grazing land management. It projects an additional net sink of 0.5 million tonnes CO₂ per year.

Apart from using Article 3.3 and 3.4 of the Kyoto Protocol, under Article 3.7 Parties that had net emissions from the land use, land-use change and forestry sector in their base-year are allowed to include this amount in their assigned amounts. Hence, this reduces the decreases required for reaching their respective targets. From June 2006, this rule applies to Portugal, the United Kingdom and the Netherlands only from the EU-15. These three countries had in 1990 net emissions of 820.4, 365.6 and 280.2 kt CO₂-equivalent respectively. The effect was accounted for but only results in minor adjustments in the gap and distance to target assessments.

For the EU-15, the aggregated use of sinks under Articles 3.3 and 3.4 amounts to 32.6 million tonnes per year. This is modest when compared to the EU-15 Kyoto commitment (approximately 10 % of the total of 342 million tonnes CO₂-equivalents per year to be reduced by the EU in total or approximately 0.8 percentage points of the EU-15 Kyoto target of – 8 %). The European climate change programme has estimated previously that potentially 112–121 million tonnes CO₂ (equivalent to about 30 % of the EU reduction) could be sequestered in the agriculture and forestry sector.

⁽³⁸⁾ Cyprus and Malta as Non-Annex 1 countries are not affected by these rules.

11 The reporting scheme

-  Under the EU monitoring mechanism all EU-15 Member States provided greenhouse gas inventory data for 1990 to 2004 for all gases.
-  Most new Member States provided greenhouse gas inventory data for 1990 to 2004, but for many reporting on fluorinated gases is not complete.
-  Reporting on the use of carbon sinks has substantially improved since last year. Also, more information has become available on the use of flexible mechanisms.
-  Further improvements in the reporting of inventories, projections, policies and measures are still needed.

Reporting of greenhouse gas inventories has improved, but needs to be further improved and include all gases, especially for new Member States. In some cases this information remains incomplete.

Even though Member States were not obliged to report under the monitoring mechanism this year, updated projections were available from 18 Member States. These projections came mainly from the 4th national communications under the UNFCCC and the reports on demonstrable progress under the Kyoto Protocol. However, in terms of the level of detail on projections,

indicators and assumptions, the overall quality of reporting of emission projections, policies and measures declined slightly.

Information on the use of flexible mechanisms under the Kyoto Protocol was available for 19 Member States. Reporting on the use of carbon sinks has substantially improved, partly due to reporting duties towards the UNFCCC in 2006.

In general, further improvements are needed regarding completeness, comparability, consistency, transparency and timeliness.

12 Glossary

ACEA	European Automobile Manufacturers Association (EU-wide agreement with ACEA and similarly also with Japanese (JAMA) and Korean (KAMA) automobile manufacturing industries)
CAP	common agricultural policy
CCPMs	common and coordinated policies and measures at EU level
CDM	clean development mechanism as defined in the Kyoto Protocol, Article 12 - projects on the reduction of GHG emissions between industrialised countries and developing countries
CFCs	chlorofluorocarbons
CHP	combined heat and power
CH ₄	methane
CITL	community independent transaction log
CO ₂	carbon dioxide
COP	Conference of the Parties
CRF	common reporting format
DNA	designated national authority
DTI	distance-to-target indicator
ECCP	European climate change programme
EEA	European Environment Agency
EMAS	eco-management and audit scheme
ETC/ACC	European Topic Centre on Air and Climate Change
EUA	emission unit allowance
GDP	gross domestic product
GHG	greenhouse gases
HCFC	hydrochlorofluorocarbon
HFC	hydrofluorocarbon

IPPC	integrated pollution prevention and control
JAMA	Japanese Automobile Manufacturers Association
JI	Joint implementation as defined in the Kyoto Protocol, Article 6 — projects on the reduction of GHG emissions between industrialised countries and countries in transition
KAMA	Korean Automobile Manufacturers Association
KP	Kyoto Protocol
LULUCF	land use, land-use change and forestry
MoU	memorandum of understanding
Mt	Mega (million) tonnes
NAP	national allocation plan
N ₂ O	nitrous oxide
PAM	policies and measures
PFCs	perfluorocarbons
RES	renewable energy sources
SF ₆	sulphur hexafluoride
UNFCCC	United Nations Framework Convention on Climate Change

Annexes: Additional information on GHG trends and projections by sector and by Member States

The annexes provide additional information on:

A1 Use of flexible mechanisms under the Kyoto Protocol, joint implementation, clean development mechanism and international emission trading in EU-15 Member States

A2 Key domestic policies and measures, their state of implementation and their main savings

A3 Sectoral emission trends and projections in the EU-15

A4 Accounting of carbon sinks by EU Member States

A5 The reporting schemes

A6 Information sources for national projections

A7 Summary of EU-25 greenhouse gas emission trends and projections

A8 Indicators on actual and projected greenhouse gas emissions for each individual EU Member State

A9 Information on national policies and measures as well as projections for each individual EU Member State

Only annexes A6 and A7 are available in printed form, all other annexes are published on the EEA website (www.eea.europa.eu).

Annex 6: Information sources for national projections

Country	Information source(s) used	Date of publication or submission
General	<ul style="list-style-type: none"> 4th national communications on climate change under the UNFCCC and reports on demonstrable progress under the Kyoto Protocol Submissions under the monitoring mechanism, pursuant to Decision No. 280/2004/EC When data was missing or incomplete: other relevant documents European Climate Change Programme (ECCP), database on Policies and Measures in Europe (list of sources for each PAM): www.oeko.de/service/pam/index.php. 	As of 24 Aug. 2006
Austria	<ul style="list-style-type: none"> 3rd national communication on climate change under the UNFCCC Austrian Climate Strategy National Allocation Plan 2005–2007 Austria's Emission Projection on Greenhouse Gases 2003–2020: Interim Report (unpublished) Austrian greenhouse gas emissions projections (2006) 	29/11/2001 18/06/2002 01/04/2004 15/06/2005 2006
Belgium	<ul style="list-style-type: none"> 4th national communication on climate change under the UNFCCC Report on demonstrable progress under the Kyoto Protocol 	23/12/2005 23/12/2005
Bulgaria	<ul style="list-style-type: none"> Second national action plan on climate change 2005–2008 	21/12/2004
Croatia	<i>Kyoto protocol not ratified, no projection data</i> <ul style="list-style-type: none"> 2006 GHG Inventory Submission to UNFCCC 1st national communication on climate change under the UNFCCC UNFCCC Country Profile, Croatia 	31/08/06 07/02/02 21/03/2005
Cyprus	<i>No Kyoto target, no projection</i>	
Czech Republic	<ul style="list-style-type: none"> 4th national communication on climate change under the UNFCCC Report on demonstrable progress under the Kyoto Protocol 	03/02/2006 03/02/2006
Denmark	<ul style="list-style-type: none"> 4th national communication on climate change under the UNFCCC Report on demonstrable progress under the Kyoto Protocol 	30/12/2005 30/12/2005
Estonia	<ul style="list-style-type: none"> 4th national communication on climate change under the UNFCCC Report on demonstrable progress under the Kyoto Protocol 	30/12/2005 30/12/2005
Finland	<ul style="list-style-type: none"> 4th national communication on climate change under the UNFCCC Report on demonstrable progress under the Kyoto Protocol 	10/02/2006 14/02/2006
France	<ul style="list-style-type: none"> Submission pursuant to Decision No. 280/2004/EC (aggregated projections) 4th national communication on climate change under the UNFCCC (partial projections by sector and by gas) 	26/01/2006 07/07/2006
Germany	<ul style="list-style-type: none"> German Monitoring Report 2002 Endbericht zum Forschungsvorhaben — Politikszenerien für den Klimaschutz — Langfristszenarien und Handlungsempfehlungen ab 2012 (Politikszenerien III) 3rd national communication on climate change under the UNFCCC National Allocation Plan 2005–2007 	31/01/2003 Mar. 2004 22/10/2002 31/03/2004
Greece	<ul style="list-style-type: none"> 4th national communication on climate change under the UNFCCC 	10/03/2006
Hungary	<ul style="list-style-type: none"> 4th national communication on climate change under the UNFCCC Report on demonstrable progress under the Kyoto Protocol 	10/03/2006 17/01/2006
Iceland	<ul style="list-style-type: none"> 4th national communication on climate change under the UNFCCC Report on demonstrable progress under the Kyoto Protocol UNFCCC Country Profile on Iceland 	28/04/2006 28/04/2006 30/03/2005

Ireland	• Determining the Share of National Greenhouse Gas Emissions for Emissions Trading in Ireland 2008–2012	Mar. 2006
	• Submission pursuant to Decision No. 280/2004/EC	2005
Italy	• 'BAU Scenario of Environment and Industry Ministers' Submission pursuant to Decision No. 280/2004/EC	June 2005
	• Domestic P&Ms and KP-MEX in the Italian Strategy to Meet the Kyoto Target – Synthesis Document	19/09/2005
	• 3rd national communication on climate change under the UNFCCC	20/01/2003
Latvia	• 4th national communication on climate change under the UNFCCC	25/05/2006
	• Report on demonstrable progress under the Kyoto Protocol	25/05/2006
Liechtenstein	• 4th national communication on climate change under the UNFCCC	07/04/2006
	• UNFCCC Country Profile	22/03/2005
Lithuania	• 4th national communication on climate change under the UNFCCC	28/12/2005
	• Report on demonstrable progress under the Kyoto Protocol	06/02/2006
Luxembourg	• Stratégie nationale de réduction des émissions de gaz à effet de serre – First part	May 2000
Malta	<i>No Kyoto target, no projection data.</i>	
Netherlands	• 4th national communication on climate change under the UNFCCC	22/12/05
	• 2005 Climate Policy Progress Report pursuant to Decision No. 280/2004/EC	June 2005
	• Questionnaire on the use of Kyoto mechanisms and update of greenhouse gas emissions projections for 2010 pursuant to Decision No. 280/2004/EC	May 2006
	• Climate Policy Evaluation memorandum 2005: On the way to Kyoto	Oct. 2005
Norway	• 4th national communication on climate change under the UNFCCC	16/02/2006
	• Report on demonstrable progress under the Kyoto Protocol	16/02/2006
	• UNFCCC Country Profile	28/01/2005
Poland	• 3rd national communication on climate change under the UNFCCC	30/11/2001
Portugal	• Portugal's National Climate Change Programme 2006	17/05/2006
	• Updated information regarding the use of mechanisms and Art.3(3) and 3(4) of the Kyoto Protocol (as submitted in Portugal's Assigned Amount Report)	May 2006
Romania	• Report on demonstrable progress under the Kyoto Protocol	31/01/2006
	• National Action Plan on Climate Change of Romania (NAPCC) – 2005–2007	2005
	• 3rd national communication on climate change under the UNFCCC	17/06/2005
Slovakia	• 4th national communication on climate change under the UNFCCC	30/12/2005
	• Report on demonstrable progress under the Kyoto Protocol	30/12/2005
Slovenia	• 4th national communication on climate change under the UNFCCC	12/06/2006
	• Report on demonstrable progress under the Kyoto Protocol	12/06/2006
Spain	• 4th national communication on climate change under the UNFCCC	23/03/2006
Sweden	• 4th national communication on climate change under the UNFCCC	30/12/2005
	• Report on demonstrable progress under the Kyoto Protocol	30/12/2005
Switzerland	• 4th national communication on climate change under the UNFCCC	02/12/2005
	• Report on demonstrable progress under the Kyoto Protocol	02/12/2005
	• UNFCCC Country Profile	01/03/2005
Turkey	<i>No Kyoto target, no projection data.</i>	
United Kingdom	• 4th national communication on climate change under the UNFCCC	15/05/2006
	• Report on demonstrable progress under the Kyoto Protocol	08/03/2006
	• Climate Change the UK Programme 2006	28/03/2006
	• UK Energy and CO ₂ Emissions Projections: Updated Projections to 2020	Feb. 2006

Annex 7: Summary of EU-25 greenhouse gas emission trends and projections

Table A7.1	EU-25 and Member States' greenhouse gas emission trends and Kyoto targets (burden-sharing) for 2008–2012
Table A7.2	EU-15 and Member States' EU burden-sharing or Kyoto targets for 2008–2012, compared with emission projections based on existing and additional domestic policies and measures

Note:

Tables A7.1 and A7.2 are based on data provided by EU Member States before 6 June 2006.

Tables A7.1 and A7.2 both present base-year emissions and EU burden sharing or Kyoto targets for EU Member States. However, the data presented differ from one table to the other for the following reasons:

- The base-year emissions reported in table A7.1 are the latest data available from national greenhouse gas inventories, as of 6 June 2006 ⁽⁴¹⁾.
- The base-year emissions used for the projections assessment and presented in table A7.2 are the data on which projections were based. Many countries have updated these base-year emissions since then, and are reflected in their last inventory submissions of 2006.

⁽⁴¹⁾ See for more detail EEA report 'Annual European Community greenhouse gas inventory 1990–2004 and inventory report 2006': http://reports.eea.europa.eu/technical_report_2006_6/en. However, final base-year data will be available in the report on the EU's assigned amount (pursuant to Article 3, Paragraphs 7 and 8 of the Kyoto Protocol) under the UNFCCC, due for publication end of 2006.

Table A7.1 EU and Member States' greenhouse gas emission trends and targets (burden-sharing) for 2008–2012

	Base-year (Mt CO ₂)	GHG emissions 2004 (Mt CO ₂)	Change 2003–2004 (in %)	Change 2004 relative to base-year (in %)	EU burden- sharing or Kyoto target (in %)	EU burden- sharing or Kyoto target (Mt CO ₂)	Distance to target indicator (index points)*
Austria	78.9	91.3	- 1.3 %	+ 15.7 %	- 13.0 %	68.68	+ 17.9 (+ 24.8)
Belgium	146.9	147.9	+ 0.2 %	+ 0.7 %	- 7.5 %	135.87	+ 1.8 (+ 5.9)
Cyprus	6.0	8.9	- 3.0 %	+ 48.2 %	No target	No target	No target
Czech Republic	196.3	147.1	- 0.3 %	- 25.1 %	- 8.0 %	180.58	- 19.9 (- 19.5)
Denmark	69.3	68.1	- 8.1 %	- 1.8 %	- 21.0 %	54.77	+ 7.9 (+ 12.9)
Estonia	42.6	21.3	+ 0.7 %	- 50.0 %	- 8.0 %	39.23	- 44.4
Finland	71.1	81.4	- 4.9 %	+ 14.5 %	0.0 %	71.10	+ 13.1 (+ 14.5)
France	567.1	562.6	+ 0.3 %	- 0.8 %	0.0 %	567.09	- 1.2 (- 0.8)
Germany	1 230.0	1 015.3	- 0.9 %	- 17.5 %	- 21.0 %	971.67	- 2.8
Greece	111.1	137.6	+ 0.3 %	+ 23.9 %	+ 25.0 %	138.82	+ 6.4
Hungary	122.2	83.1	- 0.2 %	- 32.0 %	- 6.0 %	114.89	- 27.8
Ireland	55.8	68.5	+ 0.1 %	+ 22.7 %	+ 13.0 %	63.03	+ 6.5 (+ 13.6)
Italy	519.6	582.5	+ 0.9 %	+ 12.1 %	- 6.5 %	485.83	+ 9.9 (+ 16.7)
Latvia	25.9	10.7	+ 0.4 %	- 58.5 %	- 8.0 %	23.82	- 52.9
Lithuania	50.9	20.3	+ 17.9 %	- 60.1 %	- 8.0 %	46.86	- 54.5
Luxembourg	12.7	12.7	+ 11.3 %	+ 0.3 %	- 28.0 %	9.14	+ 3.3 (+ 19.9)
Malta	2.2	3.2	+ 4.2 %	+ 45.9 %	No target	No target	No target
Netherlands	214.3	217.8	+ 1.1 %	+ 1.6 %	- 6.0 %	201.45	- 0.7 (+ 5.8)
Poland	565.3	386.4	+ 1.0 %	- 31.6 %	- 6.0 %	531.34	- 27.4
Portugal	60.0	84.5	+ 1.0 %	+ 41.0 %	+ 27.0 %	76.15	+ 14.6 (+ 22.1)
Slovakia	73.2	51.0	- 0.1 %	- 30.3 %	- 8.0 %	67.36	- 24.7
Slovenia	20.2	20.1	+ 2.0 %	- 0.8 %	- 8.0 %	18.60	- 1.0 (+ 4.8)
Spain	289.4	427.9	+ 4.8 %	+ 47.9 %	+ 15.0 %	332.79	+ 31.2 (+ 37.4)
Sweden	72.5	69.9	- 1.5 %	- 3.6 %	+ 4.0 %	75.35	- 8.4 (- 6.4)
United Kingdom	767.9	659.3	+ 0.2 %	- 14.1 %	- 12.5 %	671.90	- 5.8 (- 5.4)
EU-15	4 266.4	4 227.4	+ 0.3 %	- 0.9 %	- 8.0 %	3925.11	+ 2.3 (+ 4.7)
EU-25	5 371.3	4 979.6	+ 0.4 %	- 7.3 %	No common target	No common target	No common target

* In brackets: excluding Kyoto mechanisms and sinks

Notes: The base-year emissions reported in this table are the latest data available from national greenhouse gas inventories (6 June 2006). Final data will be available in the report on the EU's assigned amount (pursuant to Article 3, Paragraphs 7 and 8 of the Kyoto Protocol) under the UNFCCC, due end of 2006.

For fluorinated gases, the EU-15 base-year emission is the sum of 15 Member States' base-year emissions. A total of 13 Member States have indicated they will select 1995 as base-year under the Kyoto Protocol; Finland and France indicate that it will use 1990. Therefore, the EU-15 base-year estimates for fluorinated gas emissions are the sum of 1995 emissions for 13 Member States and 1990 emissions for Finland and France.

For Austria, Belgium, Czech Republic, Denmark, Finland, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Slovenia, Spain, Sweden, the United Kingdom and the EU-15, the effect of Kyoto mechanisms and carbon sinks were included in the calculations of the distance to target indicator (DTI). For these countries, the values in brackets give the DTI without Kyoto mechanisms and sinks.

Source: EEA, based on EU Member States greenhouse gas inventories.

Table A7.2 EU-15 and Member States' EU burden-sharing or Kyoto targets for 2008–2012, compared with emission projections based on existing and additional domestic policies and measures

	GHG emissions for base-year used for projections assessment ⁽¹⁾			With existing policies and measures				With additional policies and measures			
	(Mt CO ₂)	EU burden sharing of Kyoto target ^(1,2)		Projections for 2010		Gap between projections and target ⁽³⁾		Projections for 2010		Gap between projections and target ⁽³⁾	
		(in % of base-year)	(Mt CO ₂)	(Mt CO ₂)	(Mt CO ₂)	(in % of base-year)	(Mt CO ₂)	(in % of base-year) ⁽⁴⁾	(Mt CO ₂)	(in % of base-year)	(Mt CO ₂)
Austria	78.4	- 13.0	68.2	89.9	+ 14.8	+ 21.8	+ 27.8	81.0	+ 3.3	+ 12.8	+ 16.3
Belgium	146.8	- 7.5	135.8	148.5	+ 1.2	12.7	+ 8.7	145.7	- 0.7	9.9	+ 6.8
Czech Republic	192.1	- 8.0	176.8	145.3	- 24.4	- 31.4	- 16.4	140.8	- 26.7	- 36.0	- 18.7
Denmark ⁽⁶⁾	69.6	- 21.0	55.0	72.5	+ 4.2	17.5	+ 25.2	72.5	+ 4.2	17.5	+ 25.2
Estonia	43.5	- 8.0	40.0	18.9	- 56.5	- 21.1	- 48.5	17.4	- 60.0	- 22.6	- 52.0
Finland	71.5	0.0	71.5	78.5	+ 9.9	7.1	+ 9.9	70.1	- 1.9	- 1.4	- 1.9
France	564.0	0.0	564.0	600.0	+ 6.4	36.0	+ 6.4	567.0	+ 0.5	3.0	+ 0.5
Germany	1 248.3	- 21.0	986.2	1 000.9	- 19.8	14.7	+ 1.2	985.7	- 21.0	- 0.5	- 0.0
Greece	111.7	+ 25.0	139.6	150.4	+ 34.7	10.8	+ 9.7	139.5	+ 24.9	- 0.1	- 0.1
Hungary	122.2	- 6.0	114.9	87.4	- 28.5	- 27.5	- 22.5	87.1	- 28.8	- 27.8	- 22.8
Ireland	55.8	+ 13.0	63.0	72.3	+ 29.6	9.2	+ 16.6	72.3	+ 29.6	9.3	+ 16.6
Italy	509.4	- 6.5	476.3	580.4	+ 13.9	104.1	+ 20.4	530.1	+ 4.1	53.8	+ 10.6
Latvia	25.3	- 8.0	23.3	13.7	- 46.1	- 9.7	- 38.1	13.0	- 48.6	- 10.3	- 40.6
Lithuania	50.9	- 8.0	46.9	25.2	- 50.5	- 21.7	- 42.5	25.2	- 50.5	- 21.7	- 42.5
Luxembourg	12.7	- 28.0	9.2	9.9	- 22.4	0.7	+ 5.6	9.9	- 22.4	0.7	+ 5.6
Netherlands	214.0	- 6.0	201.4	221.7	+ 3.6	20.5	+ 9.6	215.6	+ 0.7	14.4	+ 6.7
Poland	498.5	- 6.0	468.6	438.4	- 12.1	- 30.2	- 6.1	438.4	- 12.1	- 30.2	- 6.1
Portugal	60.0	+ 27.0	77.2	88.0	+ 46.7	11.8	+ 19.7	85.6	+ 42.7	9.4	+ 15.7
Slovakia	71.9	- 8.0	66.1	55.8	- 22.4	- 10.4	- 14.4	54.1	- 24.8	- 12.0	- 16.8
Slovenia	20.2	- 8.0	18.6	21.2	+ 4.7	2.6	+ 12.7	19.9	- 1.7	1.3	+ 6.3
Spain	288.4	+ 15.0	331.7	436.3	+ 51.3	104.6	+ 36.3	436.3	+ 51.3	104.6	+ 36.3
Sweden	72.2	+ 4.0	75.1	71.5	- 1.0	- 3.6	- 5.0	71.5	- 1.0	- 3.6	- 5.0
United Kingdom	766.7	- 12.5	671.2	622.2	- 18.8	- 48.6	- 6.3	588.7	- 23.2	- 82.2	- 10.7
EU-15 <small>(7, 8, 9)</small>	4 269.4	- 8.0	3 929.2	4 243.1	- 0.6	315.2	+ 7.4	4 071.4 <small>(7)</small>	- 4.6	143.6	3.4

Notes: ⁽¹⁾ The base-year emissions used for the projections assessment and presented in this table are the data on which projections were based. Many countries have updated their base-year emissions since projections were made, reflected in their last inventory submissions. This explains why, for many countries, the base-year emissions presented in this table A7.2 differ from base-year emissions reported in the emission inventories (Table A7.1). This also explains why many EU burden-sharing or Kyoto targets (in Mt CO₂-equivalent) differ from the ones presented in Table A7.1.

⁽²⁾ In the Council decision (2002/358/EC) on the approval by the EU of the Kyoto Protocol, the various commitments of the Member States are expressed as percentage changes from the base-year. In 2006 the respective emission levels (assigned amounts) will be determined in terms of tonnes of CO₂-equivalent and reported separately. The countries' and the EU-15 Kyoto target levels in this table (in Mt CO₂-equivalent) were derived from the base-year emissions levels (in Mt CO₂-equivalent) provided in this table (which are somewhat different from the base-year emissions in table 7.1 as explained above) and the reduction targets in %.

For Portugal, the Netherlands and the United Kingdom, in accordance with Art. 3.7 of the Kyoto Protocol, net emissions from the land use, land-use change and forestry sector during their base-year were taken into account to calculate these countries' respective emissions target levels (in Mt CO₂-equivalent). This inclusion results in a small increase of the total EU-15 emission target level of 1.36 Mt CO₂-equivalent. See Chapter 2 for more details.

⁽³⁾ For gaps between projections and targets, positive figures signify that the target is not met; negative figures mean a projected over-delivery of emissions.

Table A7.2 EU-15 and Member States' EU burden-sharing or Kyoto targets for 2008–2012, compared with emission projections based on existing and additional domestic policies and measures (cont.)

	With additional measures, Kyoto mechanisms and carbon sinks							
	Use of Kyoto mechanisms ⁽⁵⁾		Use of carbon sinks ⁽⁵⁾		Projections for 2010		Gap between projections and target ⁽³⁾	
	(Mt CO ₂)	(in % of base-year)	(Mt CO ₂)	(in % of base-year)	(Mt CO ₂)	(in % of base-year)	(Mt CO ₂)	(in % of base-year) ⁽⁴⁾
Austria	- 7.0	- 8.9	- 0.7	- 0.9	73.3	- 6.5	+ 5.1	+ 6.5
Belgium	- 8.6	- 5.8			137.2	- 6.6	+ 1.4	+ 0.9
Czech Republic			- 1.2	- 0.6	139.6	- 27.4	- 37.2	- 19.4
Denmark ⁽⁶⁾	- 4.5	- 6.5	- 0.5	- 0.7	67.5	- 3.0	+ 12.5	+ 18.0
Estonia					17.4	- 60.0	- 22.6	- 52.0
Finland	- 2.4	- 3.4	0.9	+ 1.3	68.6	- 4.0	- 2.9	- 4.0
France			- 3.2	- 0.6	563.8	- 0.0	- 0.2	- 0.0
Germany					985.7	- 21.0	- 0.5	- 0.0
Greece					139.5	+ 24.9	- 0.1	- 0.1
Hungary					87.1	- 28.8	- 27.8	- 22.8
Ireland	- 3.6	- 6.5	- 2.1	- 3.8	66.6	+ 19.4	+ 3.6	+ 6.4
Italy	- 39.6	- 7.8	- 10.6	- 2.1	479.9	- 5.8	+ 3.6	+ 0.7
Latvia					13.0	- 48.6	- 10.3	- 40.6
Lithuania					25.2	- 50.5	- 21.7	- 42.5
Luxembourg	- 3.0	- 23.6			6.9	- 46.0	- 2.3	- 18.0
Netherlands	- 20.0	- 9.3	- 0.1	- 0.1	195.5	- 8.6	- 5.9	- 2.8
Poland					438.4	- 12.1	- 30.2	- 6.1
Portugal	- 1.9	- 3.1	- 4.7	- 7.8	79.1	+ 31.9	+ 1.9	+ 3.1
Slovakia					54.1	- 24.8	- 12.0	- 16.8
Slovenia			- 1.7	- 8.3	18.2	- 10.0	- 0.4	- 2.0
Spain	- 20.0	- 6.9	- 5.5	- 1.9	410.9	+ 42.4	+ 79.2	+ 27.4
Sweden			- 2.1	- 3.0	69.4	- 3.9	- 5.7	- 7.9
United Kingdom			- 4.1	- 0.5	584.6	- 23.7	- 86.6	- 11.3
EU-15 <small>(7, 8, 9)</small>	- 110.5	- 2.6	- 32.6	- 0.8	3 928.3 <small>(7)</small>	- 8.0	- 0.9	0.0

⁽⁴⁾ Relative gaps between projections and targets (in percentage points) are relative to base-year emissions, not to target levels.

⁽⁵⁾ The negative figures for Kyoto mechanisms and carbon sinks represent projected emission reductions.

⁽⁶⁾ 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.

⁽⁷⁾ Some Member States did not report any additional measures, Kyoto mechanisms or carbon sinks or do not intend to use Kyoto mechanisms. In order to calculate EU emission 'with additional measures' projections, 'with existing measures' projections are taken for those Member States for which additional measures projections are not available.

⁽⁸⁾ Gaps for total EU in terms of million tonnes of CO₂-equivalent are not equal to the sum of Member States' gaps due to slight inconsistency between the Member States' burden-sharing targets and the EU's Kyoto target in terms of percentages.

⁽⁹⁾ There is no joint target for the EU-8 or EU-23. Therefore, the gaps between projections and target are only given for the EU-15.

Source: EEA, based on EU Member States greenhouse gas inventories and projections.

European Environment Agency

**Greenhouse gas emission trends and projections
in Europe 2006**

2006 — 63 pp. — 21 x 29.7 cm

ISBN 92-9167-885-6

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ISBN 92-9167-885-6



9 789291 678853



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