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Tracking progress towards Kyoto targets

Executive summary

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Executive summary

This report presents an assessment of the current and projected progress of EU Member States, EU candidate countries and other EEA member countries towards their respective targets under the Kyoto Protocol and of progress towards the EU target for 2020. This is based on their past greenhouse gas emissions between 1990 and 2006, and the projected greenhouse gas emissions of these countries during the Kyoto commitment period 2008–2012 and for 2020, derived from data and related information they provided before 1 June 2008.

Updated emission projections or national programmes were provided by five EU-15 and three EU-12 Member States since the 2007 assessment, although there was no formal reporting obligation in 2008. Further changes in projection data compared to the 2007 analysis appear for Denmark, the Netherlands, Spain, Sweden and the United Kingdom, as the expected quantitative effect of the European Union Emission Trading Scheme (EU ETS), reported by these countries separately from their total emission projections and further included by EEA in the 2007 analysis, was not considered in the present assessments in order to adopt a consistent approach across all countries.

EU-27 greenhouse gas emissions are decreasing. This overall trend is projected to continue until 2020 but further emission reductions will be needed to meet the target of a 20 % reduction by 2020 compared to 1990.

Greenhouse gas emissions in the EU-27 account for approximately 10.5 % of global greenhouse gas emissions covered by the United Nations Framework Convention on Climate Change (UNFCCC). Total EU-27 emissions are dominated by EU-15 Member States, in particular Germany, the United Kingdom, Italy, France and Spain (by decreasing order). More than 80 % of greenhouse gas emissions are energy related — that is, related to the production of electricity and heat, road transportation, etc.

Greenhouse gas emissions per capita vary widely

among European countries, with an EU-27 average of 10.4 tonnes carbon dioxide equivalent (t CO₂-equivalent) per capita. Average per capita emissions in the EU-27 decreased between 1990 and 2006. However, they have been increasing in recent years in the EU-12. The emission intensities of European economies declined in almost all EU-27 Member States between 1990 and 2006, with an average decline of 33 % in the EU-27 and 30 % in the EU-15.

Between 1990 and 2006, greenhouse gas emissions decreased by 7.7 % in the EU-27. The largest absolute emission reductions took place in Germany, the United Kingdom and in most EU-12 Member States, while the largest absolute increases were observed in southern EU-15 Member States (Spain, Portugal, Greece and Italy). Between 2005 and 2006, greenhouse gas emissions decreased by 0.3 % in the EU-27. The largest absolute reductions took place in France, Italy, Spain and Belgium while the largest absolute increases were observed in Poland, Finland and Denmark.

The EU is committed to achieve at least a 20 % reduction of its greenhouse gas emissions by 2020 compared to 1990 and is ready to reduce emissions by as much as 30 % under a new global climate change agreement when other developed countries make comparable efforts. With the measures currently in place, EU-27 greenhouse gas emissions are projected to increase by 1 % between 2006 and 2010. With the implementation of additional measures, EU-27 emissions are projected to decrease continuously between 2006 and 2020. Nevertheless, current projections indicate that the EU-27 will not be able to reach the 20 % reduction target. Most projections from Member States do not, however, take into account the effects of the EU climate change and energy package proposed by the Commission in January 2008.

In 2006, EU-15 emissions were above the Kyoto Protocol target of – 8 %. However, as indicated in the 2007 analysis, projections from Member States for 2010 suggest that the target will be met by a large margin through further implementation of

existing and additional measures, use of carbon sinks and Kyoto mechanisms. Furthermore, the EU ETS will bring important further reductions, which are not yet fully accounted for by Member States in their projections.

Greenhouse gas emissions in the pre-2004 EU Member States (EU-15) decreased for the second consecutive year between 2005 and 2006.

Under the Kyoto Protocol, during the whole period 2008–2012, the EU-15 must reach an average annual level of greenhouse gas emissions 8 % below the base-year level (close to 1990 emissions). In 2006, a 2.7 % reduction of EU-15 greenhouse gas emissions compared to base-year levels had been achieved, a shortfall of 5.3 %. As was already projected by Member States in 2007, the EU-15 should achieve the target, since projected 2010 emissions are well below this. Achievement of the EU-15 Kyoto target relies on a number of conditions (Figure ES.1):

- full delivery of emission reductions from existing domestic policies and measures, already implemented by Member States;
- rapid adoption and implementation of additional policies and measures currently under discussion at European and national levels;
- accounting of CO₂ removal from land use, land-use change and forestry;
- use of Kyoto mechanisms to the full extent currently being implemented and planned by Member States;
- substantial overachievement of their individual targets by some Member States, to cover the gap left by those Member States currently anticipating that they will not achieve their targets;
- achievement of the emission reductions, currently projected by most Member States for the single year 2010, during each year of the whole five-year commitment period, from 2008 to 2012.

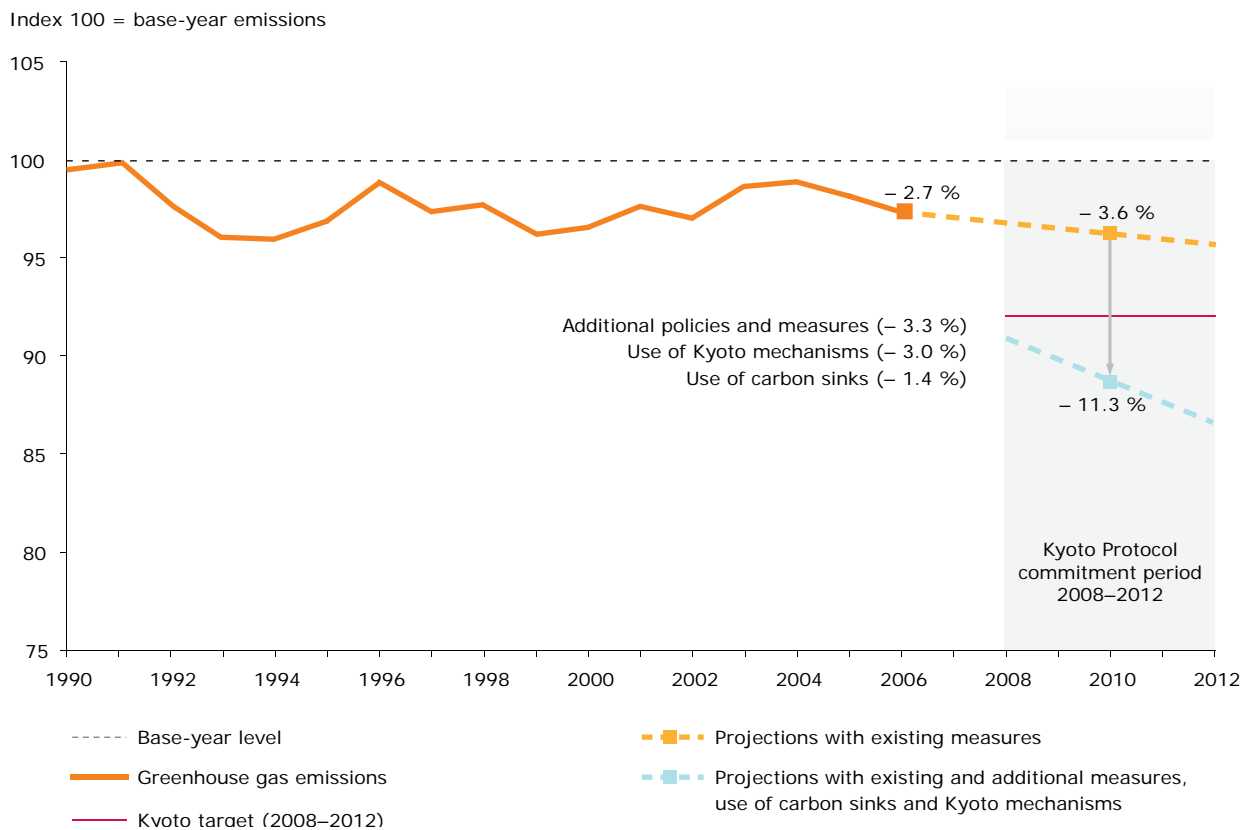
With the existing domestic policies and measures (currently in place), emissions are expected to continue decreasing between 2006 and 2010, to reach a level 3.6 % below base-year emissions. If adopted on time and fully implemented, the additional domestic policies and measures currently under discussion in 10 Member States could result in a further reduction of 3.3 % relative to the base year. The use of Kyoto mechanisms (clean development mechanism and joint implementation), currently planned by ten countries, would help to reduce emissions by a further 3.0 %. It is estimated that carbon sink activities will result in a further 1.4 % reduction. Hence, if all the projected reductions from domestic policies and measures, carbon sinks and Kyoto mechanisms were achieved, the EU-15 could reach a level of emissions 11.3 % lower than base-year emissions, therefore overachieving its 8 % reduction target by 3.3 %.

This overall result will be obtained under the condition that all Member States achieve the full emissions reductions they are projecting during the whole commitment period. In particular, it assumes that some Member States will exceed substantially their required level of emissions reduction to cover the gap left by the Member States whose projections currently indicate they will not achieve their own target.

Some Member States expect significant emission reductions in a limited time frame (2006–2010), from policies and measures that have not been implemented yet. In the end, some Member States might make use of Kyoto mechanisms more intensively than they are currently planning.

A separate estimate of the overall effect of the EU ETS, based on a comparison between verified emissions during the first trading period 2005–2007 and the European Commission's decisions on proposed national allocation plans (NAPs) for the period 2008–2012, indicates that substantial reductions from base-year emissions could be achieved. As most projections from Member States do not fully account for this effect in their projections, further reductions could take place from those already projected by EU-15 Member States.

Figure ES.1 EU-15 greenhouse gas emissions and projections for the Kyoto period 2008–2012



Note: The full effect of the EU Emission Trading Scheme is not reflected in all Member States' projections.

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

Twelve EU-15 Member States project they will achieve their individual targets. Four of them reached a level below their target in 2006.

In 2006, the emissions in four Member States (France, Greece, Sweden and the United Kingdom) were below their respective burden-sharing targets.

Based on their national projections for 2010, twelve Member States (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Luxembourg, the Netherlands, Portugal, Sweden and the United Kingdom) expect to meet their 2008–2012 burden-sharing targets through a combination of existing and planned domestic policies and measures, the use of carbon sinks and the use of Kyoto mechanisms. Four of these Member States (Germany, Greece, Sweden and the United Kingdom) even anticipate achieving their targets through reductions from existing measures alone.

Projections from three Member States indicate that they will not meet their targets. However, projections submitted in 2008 indicate that gaps between targets and projections are much narrower than last year.

In 2006, emissions in Denmark, Italy and Spain were well above their individual targets. Their 2010 projections of greenhouse gas emissions indicate that they will not meet their targets, despite the use of Kyoto mechanisms or carbon sinks. However, the gaps between these countries' projections and their respective targets have been significantly reduced since last year, particularly projections for Italy and Spain. Furthermore, the emission restrictions facing the industries covered by the EU ETS in Denmark and Spain are not fully accounted for in projections of national emissions and should make a significant contribution towards helping these countries achieve their targets.

Expected reductions from the use of Kyoto mechanisms by 11 EU Member States to meet their individual targets have increased compared to the 2007 analysis.

Ten EU-15 Member States (Austria, Belgium, Denmark, Finland, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain) and Slovenia have decided to use Kyoto mechanisms in order to meet their targets under the Kyoto Protocol. The emission reductions from the use of Kyoto mechanisms by these countries corresponds to approximately 3.0 percentage points of the 8 % emission reduction required for the EU-15. The reduction expected by these countries increased by 18 % compared to

2007, while the financial resources allocated for using the mechanisms increased by 3 %, with a total amount of EUR 3.0 billion for the whole five-year commitment period. The increase in planned emission reductions is mostly due to Spain. Italy reported a significantly reduced budget allocated to Kyoto mechanisms, although a larger reduction is planned.

Carbon sinks will provide a further reduction in EU emissions.

Although most EU-15 Member States intend to use carbon sinks to achieve their Kyoto targets, the projected total amount of CO₂ to be removed between 2008 and 2012 is relatively small and will amount to 57.5 Mt CO₂ per year for EU-15 Member States, a reduction of 1.35 % from EU-15 base-year emissions. This is 50 % more than what was projected in 2007.

Greenhouse gas emissions have been decreasing in all main sectors (except transport) and are projected to further decrease (except in industrial processes). Significant reductions in greenhouse gas emissions between 2006 and 2010 (in relative terms) can be expected from existing measures in the waste sector and from additional measures in the transport sector. The targets on renewable energy for 2010 and 2020 will not be met without significant further efforts from Member States.

EU-15 greenhouse gas emissions from energy supply and use (excluding transport) were 4 % below 1990 levels in 2006, while energy demand increased by 13 % in the same period. With the existing measures, greenhouse gas emissions are expected to decrease by a further percentage point until 2010. In the energy supply sector, despite efficiency improvements, emissions from public electricity and heat production have increased by 7 % since 1990, driven by increasing electricity demand. Since 2004, these emissions have remained stable. Decoupling of greenhouse gas emissions from energy consumption has been observed in almost all Member States, although large differences can be observed in the extent of decoupling among Member States. CO₂ emissions from households decreased by 0.7 % from 1990 to 2006, while the number of dwellings increased by 19 %, which indicates gains in energy efficiency.

The share of renewable energy use increased between 2005 and 2006. Although progress has been made by Member States towards their national indicative targets on electricity production from renewable energy sources by 2010 (RES-E), only

12 Member States expect to achieve their national indicative targets by 2010. The 2020 target of a 20 % share of renewable energy in overall EU-27 energy consumption by 2020 will require the share of renewable energy to be at least double from current levels. According to Member States, green certificates and feed-in tariffs were the most successful means of promoting electricity generated from RES across the EU.

The share of electricity from combined heat and power (CHP) in electricity production in EU-27 has increased very slowly since the 1997 Community strategy to promote CHP, which set an indicative 18 % target for 2010 for the EU-15. Further efforts are therefore needed to increase the share of CHP by 2010 from the 2006 level of just 10.1 %.

EU-15 emissions from transport, which represent a fifth of all EU-15 greenhouse gas emissions, increased by 26 % from 1990 to 2006 (36 % if emissions from international aviation and maritime transport are taken into account). More than 90 % of total EU domestic transport emissions are due to road transport. After a decrease in these emissions between 2004 and 2005, they increased very slightly in 2006 (0.3 % or 2.1 million tonnes). The overall EU-15 trend has been dominated on one side by the decreases observed in Germany since 1999, mainly attributed to an increased share of diesel-powered cars, increasing fuel prices and purchase of fuel outside Germany, and on the other side by the increases in emissions observed in other countries, in particular Spain and Italy. With existing domestic policies and measures, domestic transport emissions are projected to be stabilised at 2006 levels by 2010 and could even be reduced if additional policies and measures were implemented. Germany, in particular, projects further reductions from the introduction of mandatory biofuels quotas and the voluntary agreement with the European Automobile Manufacturers Association (ACEA) which aims to limit the amount of CO₂ emitted by passenger cars sold in Europe. The average CO₂ emissions of new passenger cars fell by 14 % between 1995 and 2006, but progress has slowed down and if current trends continue, the EU objective of 120 g CO₂/km by 2010 will not be met. Consequently, the Commission has adopted a regulation aiming to achieve a Europe-wide reduction in the average CO₂ emissions of new cars by setting mandatory targets for individual car manufacturers.

EU-15 CO₂ emissions from international aviation and maritime transport, not addressed under the Kyoto Protocol, increased by 102 % and 60 %, respectively, between 1990 and 2006.

Greenhouse gas emissions from industrial processes (CO₂, nitrous oxide (N₂O) and fluorinated gases) have fallen by 12 % compared to 1990 levels but they are projected to increase slightly until 2010 from 2006 levels if no additional measures are implemented. N₂O emissions from chemical industries decreased by 24 % between 1990 and 2006. In the same period, hydrofluorocarbon (HCFC) emissions from refrigeration and air conditioning, currently accounting for 1 % of total EU-15 greenhouse gas emissions, increased by more than 500 times. Furthermore, CO₂ emissions from cement production are increasing and will continue to do, as production is projected to increase and no sign of decoupling of cement production and greenhouse gas emissions from cement production has yet been observed.

Greenhouse gas emissions from agriculture fell by 11 % between 1990 and 2006 and under existing domestic policies and measures are projected to fall further by 2010 to 2 % below 2006 levels.

Greenhouse gas emissions from the waste management sector fell by 39 % between 1990 and 2006. Greenhouse gas emissions from this sector are projected to decrease further to approximately 44 % below 1990 levels by 2010.

Eight out of ten policies and measures implemented in 22 Member States to reduce greenhouse gas emissions were either introduced in response to EU common and coordinated policies and measures (CCPMs) or have been reinforced by them. The largest projected reductions of greenhouse gas emissions are related to the EU ETS and the promotion of renewable energy.

The CCPMs which are estimated by Member States to deliver the largest greenhouse gas emissions reductions over the whole period 1990–2012 are:

- the Emissions Trading Directive (2003);
- the Directive on the Promotion of Electricity from Renewable Energy Sources (2001);
- the Biofuels Directive (2003);
- the voluntary agreements to reduce per km CO₂ emissions from new cars reached with the European (1998), Japanese and Korean (1999) automobile industries;
- the Directive on the Energy Performance on Buildings (2002);

- the Directive on Taxation of Energy Products and Electricity (2003);
- the Cogeneration Directive (2004).

Some Member States still need to implement or reinforce EU policies through additional measures at national level. The largest further emission reductions projected from such measures correspond to the Directive on the Promotion of Electricity from Renewable Energy Sources, the Directive on the Energy Performance on Buildings and the Cogeneration Directive.

The European Commission, through the second phase of the European Climate Change Programme (ECCP), has proposed further domestic policies and measures to contribute to meeting the EU Kyoto target. Specific areas for which additional emission reduction measures for 2008–2012 are being developed include aviation, fuel quality and CO₂ emissions from cars.

In addition, the European Commission's climate change and energy package from January 2008 proposes legislation to expand and strengthen the EU ETS for the period beyond 2012, to further increase the use of renewable energy and biofuels, and to set a regulatory framework for the capture and geological storage of CO₂.

The EU ETS will bring significant emission reductions between 2008 and 2012. Its overall effect could represent at least a 3.3 % emissions reduction from base year in the EU-15.

The EU ETS represents more than 40 % of total greenhouse gas emissions in the EU. 839 installations (8 % of the total) emit more than 80 % of all emissions in the ETS, representing about a third of the total EU-27 greenhouse gas emissions.

In the first trading period of the EU ETS (2005–2007), emission allowances exceeded verified emissions in the whole EU by more than 3 %. In most EU-12 Member States, significantly higher differences were observed. As a result of this overallocation, the price of emission allowances for the trading period dropped below one euro per tonne of CO₂ in 2007. For the second trading period (2008–2012), the European Commission has enforced stricter limits on allowances, which are below emission projections for the period 2008–2012 and 6 % below average verified emissions during the first trading period (2005–2007). The prices for 2008 allowances have remained between EUR 19 and EUR 29 since the start of the second trading period in 2008. The

EU ETS could reduce EU-15 emissions by around 139 Mt CO₂ per year during the period 2008 to 2012, corresponding to 3.3 % of base-year emissions. The total emission reduction in the EU ETS sectors could theoretically be achieved by operators through the use of Kyoto mechanisms only. However, it is expected that the reduction will be achieved by a combination of measures at installation level and Kyoto mechanisms.

In the EU-12, Member States project they will achieve their Kyoto targets despite projected increases in emissions between 2006 and 2010

The greenhouse gas emissions in 2006 in nine EU-12 Member States (Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and the Slovak Republic) were below their respective Kyoto or burden-sharing targets. All these Member States project that they will meet their Kyoto targets. Slovenia intends to meet its target with the use of Kyoto mechanisms and carbon sinks. If these had already been taken into account, 2006 emissions would already stand below the target. Cyprus and Malta do not have a target under the Kyoto Protocol. Cyprus, the Czech Republic, Estonia and Slovenia are the only EU-12 Member States projecting that their emissions will decrease in the period between 2006 and 2010.

There is a mixed situation in EU candidate countries and other EEA member countries

Iceland, Liechtenstein and Norway will need further reductions of greenhouse gas emissions between 2006 and 2012 in order to meet their respective targets, which they still expect to achieve. Switzerland does not currently anticipate that it will reach its Kyoto target (despite the projected use of Kyoto mechanisms). An EU candidate country, Turkey, has ratified the UNFCCC, but not the Kyoto Protocol and thus has no Kyoto target. This country has the lowest emission per capita among all EEA member countries, less than half of the average EU-27 per capita emissions, although it is also the EEA member country in which the largest increases in emissions were observed between 1990 and 2006. Another EU candidate country, Croatia, ratified the Kyoto Protocol in May 2007. In 2006, Croatia's emissions were well below its Kyoto target, which it projects it will meet.

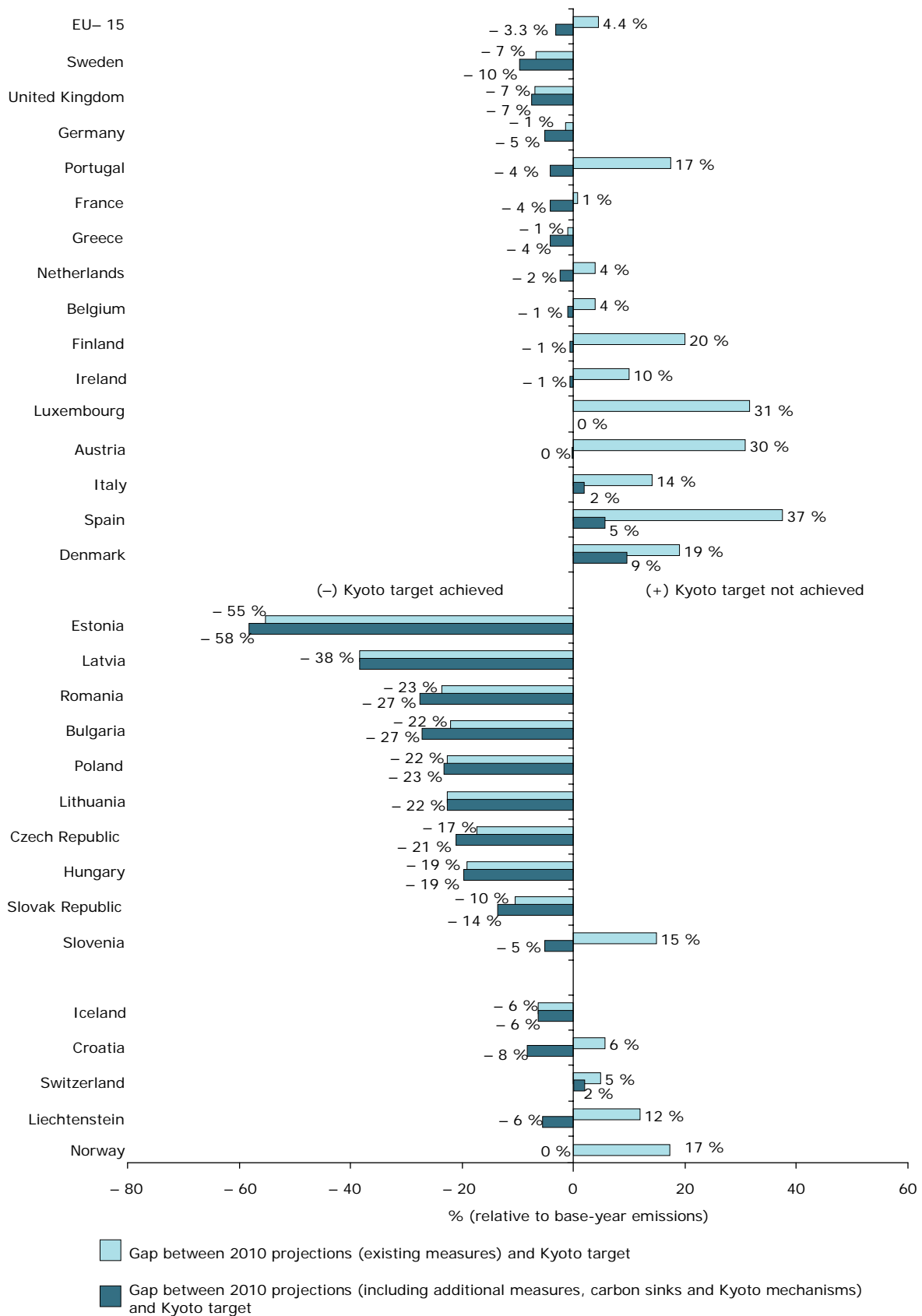
Table ES.1 Summary of planned measures and progress towards targets (by country)

Country	EU burden-sharing or Kyoto target	2006 emissions lower than Kyoto target?	Planned 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		
EU-15	- 8.0 %	No	✓	✓	✓	✓	Yes	
EU-15 Member States								
Austria	- 13.0 %	No	✓	✓	✓	✓	Yes	
Belgium	- 7.5 %	No	✓		✓		Yes	
Denmark	- 21.0 %	No	✓		✓	✓	No	
Finland	0.0 %	No	✓	✓	✓	✓	Yes	
France	0.0 %	Yes	✓	✓		✓	Yes	
Germany	- 21.0 %	No	✓	✓		✓	Yes	
Greece	+ 25.0 %	Yes	✓	✓		✓	Yes	
Ireland	+ 13.0 %	No	✓	✓	✓	✓	Yes	
Italy	- 6.5 %	No	✓	✓	✓	✓	No	
Luxembourg	- 28.0 %	No	✓	✓	✓		Yes	
Netherlands	- 6.0 %	No	✓		✓	✓	Yes	
Portugal	+ 27.0 %	No	✓	✓	✓	✓	Yes	
Spain	+ 15.0 %	No	✓	✓	✓	✓	No	
Sweden	+ 4.0 %	Yes	✓			✓	Yes	
United Kingdom	- 12.5 %	Yes	✓			✓	Yes	
EU-12 Member States								
Bulgaria	- 8.0 %	Yes	✓	✓			Yes	
Czech Republic	- 8.0 %	Yes	✓	✓		✓	Yes	
Cyprus	n.a.	n.a.	✓	✓	n.a.	n.a.	n.a.	
Estonia	- 8.0 %	Yes	✓	✓			Yes	
Hungary	- 6.0 %	Yes	✓	✓			Yes	
Latvia	- 8.0 %	Yes	✓				Yes	
Lithuania	- 8.0 %	Yes	✓				Yes	
Malta	n.a.	n.a.	✓		n.a.	n.a.	n.a.	
Poland	- 6.0 %	Yes	✓			✓	Yes	
Romania	- 8.0 %	Yes	✓	✓			Yes	
Slovak Republic	- 8.0 %	Yes	✓	✓			Yes	
Slovenia	- 8.0 %	No	✓	✓	✓	✓	Yes	
EU candidate countries								
Croatia	- 5.0 %	Yes	✓	✓		✓	Yes	
Turkey	n.a.	n.a.	✓				n.a.	
Other EEA member countries								
Iceland	10.0 %	No	✓				Yes	
Liechtenstein	- 8.0 %	No	✓		✓		Yes	
Norway	+ 1.0 %	No	✓		✓	✓	Yes	
Switzerland	- 8.0 %	No	✓	✓	✓		No	

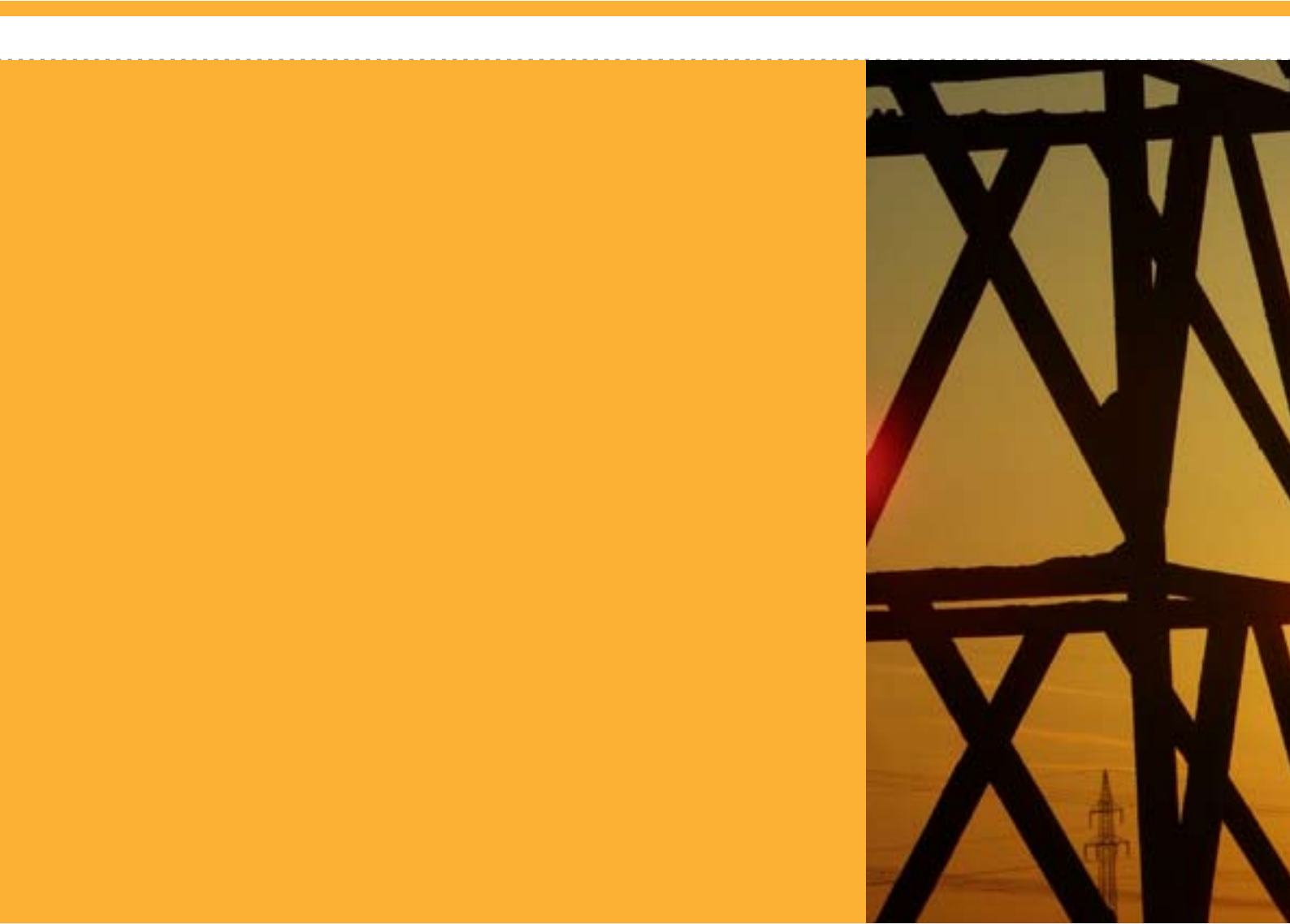
Note: ✓ : projected; n.a.: not applicable (no Kyoto target). The emission restrictions facing the industries covered by the EU ETS are not fully accounted for in projections of national emissions and should make a significant contribution towards helping EU Member States achieve their targets.

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

Figure ES.2 Gaps between EU Kyoto and burden-sharing targets and projections for 2010 for EU Member States, EU candidate countries and other EEA member countries



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



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