# X THE EUROPEAN POLICY FOR CLIMATE CHANGE, GREECE'S ENVIRONMENTAL PERFORMANCE, AND RECENT POLICY MEASURES

## 1 THE CURRENT EU POLICY FOR CLIMATE CHANGE

Following the rather disappointing outcome of the UN climate change conference in Copenhagen on 7-18 December 2009,[1] the European Council, at its meeting on 25-26 March 2010, concluded on the need to bring a new dynamic to the international negotiation on climate change. According to the Council, the negotiation should ultimately lead to a global and comprehensive legal agreement, the only effective way to reach the agreed objective of keeping the increase in global temperatures, relative to pre-industrial levels, below 2ºC. The EU and its Member States will implement their commitment to provide €7.2 billion over the 2010-2012 period (€2.4 billion annually) to developing countries as fast-start financing for actions aimed at mitigating climate change;[2] the EU and other developed countries have also committed to jointly mobilise 100 billion US dollars per year by 2020.

## 2 TRENDS IN GREENHOUSE GAS EMISSIONS IN COUNTRIES OF THE EU

In the context of the EU strategy on climate change and energy, known as the "20/20/20" strategy, whereby the EU has set itself the triple target of reducing greenhouse gas emissions by 20%, increasing the share of Renewable Energy Sources (RES) in overall energy consumption to 20%, and improving energy efficiency by 20% by 2020 (compared to 1990 levels), it is of relevance to monitor greenhouse gas emission trends. Country-specific data for the year 2006 were already presented by the Bank of Greece in last year's Annual Report.[3] In 2007, total greenhouse gas emissions in the EU-27, excluding "land use, land use change and forestry" and emissions from international aviation and maritime transport, amounted to 5,045 million tonnes of carbon dioxide ($CO_2$) equivalent, i.e. 9% less than in 1990. In the EU-15, 2007 greenhouse gas emissions totalled 4,052 million tonnes (4% below 1990 levels), accounting for 80% of total emissions (up from 76% in 1990). Among the older Member States, Germany and the United Kingdom were jointly responsible for nearly 1/3 of the total EU-27 emissions in 2007, with shares of 19% and 13% respectively (their corresponding shares in total EU-15 emissions being 24% and 16%), followed by Italy and France, with shares of 11% each (their corresponding shares in total EU-15 emissions being 14% and 13%). However, Germany and the United Kingdom saw their gas emission shares drop relative to 1990, while Italy's rose slightly. The smallest gas emission contributors were Luxembourg (0.3%), Sweden and Denmark (1.3%), which all had similar shares in total EE-15 emissions (see Table X.1).

As shown in the same table, countries which, due to size, make the largest contributions to overall greenhouse gas (GHG) emissions achieve better scores in terms of GHG emissions per capita or per unit of gross domestic product (GDP). This can be attributed to a number of factors, such as economic restructuring, the increased energy efficiency of power production and other plants, the energy savings of households and enterprises, energy market deregulation, and switches in fuels (e.g. from oil and coal to natural gas) for electricity production. In particular, as shown by the per capita GHG emission figures, most of the EU-15 Member States reduced their emissions between 1990 and 2007, with Sweden, the best scorer, reducing its emissions to 7 tonnes of $CO_2$ equivalent/person. Luxembourg, the worst scorer in the EU-15, with 27 tonnes of $CO_2$ equivalent/person, was nonetheless the Member State that made the greatest improvement. In terms of GHG emissions per unit of GDP, the EU-15 succeeded in reducing its emissions between 1990 and 2007, with Sweden, on one end, reducing its emissions to 0.02 kg of $CO_2$ equivalent/unit of GDP and Greece, on the other, emitting a high of 0.73

1 See Bank of Greece, *Monetary Policy 2009-2010*, March 2010, Special feature 2.F.
2 Developed countries will raise a total of 30 billion US dollars over the same period, as pledged under the Copenhagen Accord.
3 Bank of Greece, *Annual Report 2008*, April 2009, Chapter X, pp. 159-160.

## Table X.1 Greenhouse gas emissions[1] in EU-15 and EU-27 Member States

| | Greenhouse gas emissions (in million tonnes of $CO_2$ equivalents) | | | Shares in EU-15 total (%) | | | Greenhouse gas emissions per capita (in tonnes of $CO_2$ equivalents) | | | Greenhouse gas emissions per unit of GDP (in kg of $CO_2$ equivalents) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1990 | 2000 | 2007 | 1990 | 2000 | 2007 | 1990 | 2000 | 2007 | 1990 | 2000 | 2007 |
| Austria | 79.0 | 81.1 | 88.0 | 1.9 | 2.0 | 2.2 | 10.3 | 10.1 | 10.6 | 0.49 | 0.39 | 0.37 |
| Belgium | 143.2 | 145.1 | 131.3 | 3.4 | 3.5 | 3.2 | 14.4 | 14.2 | 12.4 | 0.71 | 0.58 | 0.45 |
| Denmark | 69.1 | 67.8 | 66.6 | 1.6 | 1.7 | 1.6 | 13.4 | 12.7 | 12.2 | 0.07 | 0.05 | 0.05 |
| Finland | 70.9 | 69.5 | 78.3 | 1.7 | 1.7 | 1.9 | 14.2 | 13.4 | 14.8 | 0.65 | 0.53 | 0.48 |
| France | 562.6 | 556.8 | 531.1 | 13.3 | 13.6 | 13.1 | 9.9 | 9.5 | 8.6 | 0.47 | 0.39 | 0.32 |
| Germany | 1,215.2 | 1.008.2 | 956.1 | 28.7 | 24.5 | 23.6 | 15.4 | 12.3 | 11.6 | 0.69 | 0.49 | 0.43 |
| *Greece* | *105.6* | *127.1* | *131.9* | *2.5* | *3.1* | *3.3* | *10.4* | *11.7* | *11.8* | *0.98* | *0.93* | *0.73* |
| Ireland | 55.4 | 69.0 | 69.2 | 1.3 | 1.7 | 1.7 | 15.8 | 18.3 | 16.0 | 1.05 | 0.66 | 0.45 |
| Italy | 516.3 | 549.5 | 552.8 | 12.2 | 13.4 | 13.6 | 9.1 | 9.7 | 9.3 | 0.51 | 0.46 | 0.43 |
| Luxembourg | 13.1 | 10.0 | 12.9 | 0.3 | 0.2 | 0.3 | 34.6 | 23.0 | 27.1 | 0.97 | 0.45 | 0.44 |
| Netherlands | 212.0 | 214.4 | 207.5 | 5.0 | 5.2 | 5.1 | 14.2 | 13.5 | 12.7 | 0.69 | 0.51 | 0.43 |
| Portugal | 59.3 | 81.7 | 81.8 | 1.4 | 2.0 | 2.0 | 5.9 | 8.0 | 7.7 | 0.65 | 0.67 | 0.62 |
| Spain | 288.1 | 385.8 | 442.3 | 6.8 | 9.4 | 10.9 | 7.4 | 9.6 | 9.9 | 0.60 | 0.61 | 0.55 |
| Sweden | 71.9 | 68.2 | 65.4 | 1.7 | 1.7 | 1.6 | 8.4 | 7.7 | 7.2 | 0.04 | 0.03 | 0.02 |
| United Kingdom | 771.1 | 673.5 | 636.7 | 18.2 | 16.4 | 15.7 | 13.5 | 11.5 | 10.5 | 1.01 | 0.69 | 0.55 |
| **EU-15** | **4,232.9** | **4,107.6** | **4,052.0** | **100.0** | **100.0** | **100.0** | **11.6** | **10.9** | **10.4** | **0.59** | **0.47** | **0.40** |
| **EU-27** | **5,564.0** | **5,053.6** | **5,045.4** | | | | **11.8** | **10.5** | **10.2** | **0.74** | **0.55** | **0.47** |

Source: European Commission, Directorate–General for Energy and Transport, *EU energy and transport in figures–statistical pocketbook 2010.*
1 Excluding international aviation and maritime transport, as well as the "land use, land use change and forestry" sector.

kg of $CO_2$ equivalent/unit of GDP. As shown by the figures given, Greece —though one of the faster improving countries in terms of per unit of GDP emissions— has considerable room for further improvement, as it still has the worst score of all the EU-15. **This underlines the even greater need for Greece to improve its energy efficiency and diversify its energy mix, step up economic restructuring and move towards a green economy.**

Regarding the percentage breakdown of the six greenhouse gases in EU-27 in 2007, carbon dioxide ($CO_2$) accounts, by far, for the largest share (83%), followed by methane ($CH_4$) and nitrous oxide ($N_2O$) with much smaller shares of 8% and 7%, respectively. Looking at the emission trends for each greenhouse gas, $CO_2$ emissions (at 4,187 million tonnes in 2007) were 5% down from 1990, while methane ($CH_4$) and nitrous oxide ($N_2O$) emissions, at 416 and 374 million tonnes of $CO_2$-equivalents, respectively, were 31% and 27% below the 1990 levels.

As far as the sources of GHG emissions are concerned (see Table X.2), energy was the single largest contributor with 3,999 million tonnes of $CO_2$ equivalent and a share of 79% in the EU-27 total for 2007. Breaking down this source category into sub-categories, public electricity and heat production accounted for 35%, followed by transport (25%, mainly road) and households (11%). With specific regard to the pollution caused by electricity production, it is worth noting the considerable disparities across the EU-15, with the shares of electricity production in total GHG emissions varying from as low as 9%-11% (France, Luxembourg) to as high as 35%-42% (Finland, Denmark and Greece), meaning that electricity production is considerably more polluting in some European countries than in others. The second largest source category of greenhouse gas emissions after energy was agriculture, with a share of 9% (462 million tonnes of $CO_2$ equivalent), followed by industrial processes and waste, with shares of 8% and 3% (430 and 141 million tonnes of $CO_2$ equivalent, respectively).

Evaluating the evolution of greenhouse gas emissions against the targets set under the Kyoto Protocol,[4] it is worth noting that **most of the EU-15 Member States are still short of the country-specific targets set under the Protocol** and will therefore require further measures, in addition to the programmes already in place, to meet their targets by 2012 (see Table X.3). In particular, Spain and Austria are the countries farthest off-track, while **Sweden and the United Kingdom appear to be the only ones to not only have met, but to have also exceeded their Kyoto commitments**.

**Greece seems to be on track towards meeting its Kyoto Protocol target of limiting the increase in its greenhouse gas emissions to 25% relative to base year 1990 by 2008-2012. Greece's GHG emissions were 24.4% higher in 2006, relative to the base year, and further improved to 23.2% in 2007.**

## 3 GREECE'S ENVIRONMENTAL PERFORMANCE: A RECENT OECD REPORT

On 15 March 2010, the OECD released its second report on Greece's environmental performance,[5] covering the period 2000-2009. The report notes the positive actions already taken in the sectors under review, identifies policy weaknesses and proposes measures to address the environmental challenges. It points out that the natural environment remains almost untouched in wide areas of the country and that considerable progress has been made in the implementation of EU environmental legislation. Other positive developments include increased investment in environmental infrastructure, the expansion of public transport systems and the reduction in travel times, the adoption of measures to address climate change and meet the Kyoto Protocol targets, the generally good state of the country's freshwater bodies, and the conservation of biodiversity. However,

4 See also Bank of Greece, *Annual Report 2008*, April 2009, Chapter X, pp. 157-176.
5 OECD, *Environmental Performance Reviews* – Greece, 15.3.2010. The first report covered the year 2000.

## Table X.2 Greenhouse gas emissions by source: EU-27, EU-15 and Greece

(in million tonnes of $CO_2$ equivalents)

| | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **EU-27** | | | | | | | | | | | | | | |
| Energy | 4,277 | 4,032 | 4,142 | 4,037 | 4,024 | 3,964 | 3,970 | 4,053 | 4,023 | 4,109 | 4,106 | 4,066 | 4,068 | 3,999 |
| Industrial processes | 478 | 456 | 452 | 460 | 432 | 393 | 405 | 393 | 390 | 401 | 412 | 420 | 417 | 430 |
| Solvents and other product use | 16 | 14 | 14 | 14 | 14 | 14 | 14 | 13 | 13 | 13 | 13 | 12 | 13 | 12 |
| Agriculture | 579 | 504 | 506 | 507 | 505 | 501 | 493 | 485 | 479 | 474 | 473 | 466 | 463 | 462 |
| Waste | 213 | 207 | 203 | 196 | 184 | 178 | 172 | 164 | 160 | 154 | 149 | 146 | 144 | 141 |
| *Total* [1] | *5,564* | *5,213* | *5,318* | *5,214* | *5,159* | *5,049* | *5,053* | *5,109* | *5,066* | *5,150* | *5,153* | *5,111* | *5,104* | *5,045* |
| **EU-15** | | | | | | | | | | | | | | |
| Energy | 3,257 | 3,178 | 3,263 | 3,195 | 3,238 | 3,213 | 3,228 | 3,299 | 3,284 | 3,343 | 3,345 | 3,313 | 3,301 | 3,233 |
| Industrial processes | 372 | 371 | 369 | 378 | 357 | 325 | 330 | 321 | 320 | 325 | 331 | 332 | 325 | 332 |
| Solvents and other product use | 14 | 12 | 12 | 12 | 12 | 12 | 12 | 11 | 11 | 11 | 10 | 10 | 10 | 10 |
| Agriculture | 419 | 402 | 406 | 407 | 407 | 406 | 403 | 394 | 389 | 385 | 383 | 377 | 373 | 371 |
| Waste | 171 | 165 | 161 | 153 | 148 | 141 | 136 | 129 | 123 | 117 | 112 | 109 | 107 | 105 |
| *Total* [1] | *4,233* | *4,128* | *4,210* | *4,146* | *4,163* | *4,098* | *4,108* | *4,154* | *4,127* | *4,180* | *4,180* | *4,141* | *4,116* | *4,052* |
| **Greece** | | | | | | | | | | | | | | |
| Energy | 78 | 82 | 84 | 89 | 93 | 93 | 98 | 101 | 100 | 104 | 105 | 105 | 104 | 108 |
| Industrial processes | 9 | 11 | 12 | 12 | 13 | 13 | 13 | 12 | 12 | 11 | 11 | 11 | 9 | 9 |
| Solvents and other product use | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 | 0,2 |
| Agriculture | 13 | 13 | 13 | 13 | 13 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 11 | 11 |
| Waste | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| *Total* [1] | *106* | *110* | *113* | *118* | *123* | *123* | *127* | *128* | *128* | *131* | *131* | *132* | *128* | *132* |

Sources: European Environment Agency, *Annual European Community greenhouse gas inventory 1990-2006 and inventory report 2009*, EEA Technical Report No 4/2009, Hellenic Ministry for the Environment, Physical Planning and Public Works, *Annual inventory submission under the convention and the Kyoto Protocol for greenhouse and other gases for the years 1990-2007*, April 2009.

1 Excluding emissions from land use, land use change and forestry.

**Table X.3 Greenhouse gas emissions[1] and the Kyoto Protocol targets**

| | 1990 | Kyoto Protocol (base year)[2] | 2007 | Change 2007 over 2006 | Change 2007 over 1990 | Change 2007 over base year | Kyoto targets 2008-2012 |
|---|---|---|---|---|---|---|---|
| | (in million tonnes of $CO_2$ equivalents) | | | (percentage changes) | | | |
| Austria | 79.2 | 79.0 | 88.0 | -3.9 | 11.3 | 11.3 | -13.0 |
| Belgium | 143.2 | 145.7 | 131.3 | -3.9 | -8.3 | -9.9 | -7.5 |
| Denmark | 69.1 | 69.3 | 66.6 | -6.2 | -3.5 | -3.9 | -21.0 |
| Finland | 70.9 | 71.0 | 78.3 | -2.0 | 10.6 | 10.3 | 0.0 |
| France | 562.6 | 563.9 | 531.1 | -2.0 | -5.6 | -5.8 | 0.0 |
| Germany | 1,215.2 | 1,232.4 | 956.1 | -2.4 | -21.3 | -22.4 | -21.0 |
| *Greece* | *105.6* | *107.0* | *131.9* | *2.9* | *24.9* | *23.2* | *25.0* |
| Ireland | 55.4 | 55.6 | 69.2 | -0.7 | 25.0 | 24.5 | 13.0 |
| Italy | 516.3 | 516.9 | 552.8 | -1.8 | 7.1 | 6.9 | -6.5 |
| Luxembourg | 13.1 | 13.2 | 12.9 | -2.9 | -1.6 | -1.9 | -28.0 |
| Netherlands | 212.0 | 213.0 | 207.5 | -0.5 | -2.1 | -2.6 | -6.0 |
| Portugal | 59.3 | 60.1 | 81.8 | -3.4 | 38.1 | 36.1 | 27.0 |
| Spain | 288.1 | 289.8 | 442.3 | 2.1 | 53.5 | 52.6 | 15.0 |
| Sweden | 71.9 | 72.2 | 65.4 | -2.2 | -9.1 | -9.3 | 4.0 |
| United Kingdom | 771.1 | 776.3 | 636.7 | -1.7 | -17.4 | -18.0 | -12.5 |
| **EU-15** | **4,232.9** | **4,265.5** | **4,052.0** | **-1.6** | **-4.3** | **-5.0** | **-8.0** |

Source: European Environment Agency, *Annual European Community greenhouse gas inventory 1990-2007 and inventory report 2009*, EEA Technical Report No 4/2009.
1 Total emissions excluding the "land use, land use change and forestry" sector.
2 For the gases $CO_2$, $CH_4$ and $N_2O$, all the Member States chose 1990 as their base year. For the gases HFC, PFC and $SF_6$, 12 Member States chose 1995 as their base year, while Austria, France and Italy chose 1990.

it is stressed that, even though the establishment of the Environmental Inspectorate filled a long-standing gap in the country's compliance assurance system, "lack of enforcement remains the Achilles' heel of environmental and land-use policy implementation". Another weakness identified in the report is the small amount of environmental expenditure, which represents less than 1% of GDP, combined with the low level of revenues from environment-related taxes which decreased to less than 2% of GDP, among the lowest shares in OECD countries. Green taxes remain limited to energy and vehicle taxation. The excessive use of irrigation water is also underlined in the report.

A number of useful recommendations are set out in the report and involve: strengthening the environmental content of the Development Assistance Programme; promoting energy efficiency and cleaner energy sources; bringing about a green fiscal reform with an expanded use of economic instruments, i.e. green taxes (e.g. energy taxation, progressive vehicle taxation, road tolls); progressively eliminating environmentally harmful subsidies (e.g. agriculture water tariffs and tax exemptions on heating oil); improving the integration of biodiversity concerns into agricultural, tourism and other sectoral policies; completing the national cadastre and the national forest registry; upgrading wastewater treatment; implementing a national irrigation policy, increasing the rate of reforestation; completing spatial and urban planning; and effectively enforcing existing legislation.