

Burden sharing and cohesion countries in European climate policy: the Portuguese example

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Abstract

Global climate change has emerged as a major policy issue in the last decade. The EU has fiercely advocated domestic action, but it is finding it hard to cope with its commitments. This is due to the stronger impact of interest groups on the national level when it comes to implementation. It is shown that Portugal and other cohesion countries may be incapable of complying with their commitments within the internal burden sharing agreement unless they manage to improve energy efficiencies. Fast growth in Portuguese emissions is expected in the face of a non-existent national plan and deteriorating energy efficiencies, unless additional measures and policies are implemented. Institutional and scientific deficiency supplemented by rapid economic development seem to be impeding the Portuguese policy goal. Moreover, the proposed formula to limit the use of flexible instruments places cohesion countries at a disadvantage. Several lessons for international and European environmental policy are taken from this case study. To reach the Kyoto target, the EU will have to develop credible mechanisms to enforce the targets of its Member States. If that is not feasible, it will have to revert to central acquisition of emission permits from abroad to make up internal shortfalls. © 2001 Elsevier Science Ltd. All rights reserved.

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1. Introduction

Mounting scientific evidence has shown that increases in greenhouse gas (GHG) emissions, mainly due to fossil fuel burning and land use change, are gradually but certainly changing the Earth's climate in an unprecedented manner. This evidence forced climate change to enter the political agenda in the early 1990s, becoming an effective part of international politics with the signature of the United Nations Framework Convention on Climate Change (FCCC) in 1992. The European Union (EU) has played a

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key role in these international negotiations by the 1990 declaration to stabilise their emissions of CO₂ in 2000 at the 1990 level (Haigh, 1993). An EU-wide energy/carbon tax was to backup the stabilisation strategy, but has not been agreed so far. The EU also pushed legally binding GHG emission targets of the Kyoto Protocol for industrialised countries. Just before Kyoto, the EU proposed an ambitious 15% cut for three GHGs by the year 2010 compared to 1990 levels (EC, 1997). At Kyoto, however, it was decided that the EU was to reduce its emissions by 8% for a basket of six GHGs. The adoption of Article 4, in the Kyoto Protocol, was fundamental for the perpetuation of the EU “bubble”. This article, almost solely implemented for EU purposes, allows Parties with emission reduction commitments to jointly meet those commitments by entering into an agreement that redistributes the total reductions among the parties to the agreement (“burden sharing”).

However, on the level of implementation of policy instruments EU performance has been lacklustre, and this is also the case for domestic climate policies. This is due to the intense and effective involvement of interest groups in the design of EU-wide and domestic policies in contrast to international climate negotiations (Michaelowa, 1998a).

2. Climate policy and interest groups

The theory of public choice is particularly relevant to climate policy as it touches every economic sector and thus matters to all interest groups in the economy. The array of uncertainties linked to the climate issue allows interest groups to choose divergent positions without being scientifically discredited. Due to the overarching nature of the issue, they can choose from a huge array of instruments¹.

National politicians see climate policy as an issue among many others that becomes only relevant if it captures voters’ attention, especially after extreme meteorological events. Voters become interested in climate policy if urgent local environmental problems have been solved and the general economic situation is good. Thus, the voters in poorer countries will be relatively less interested. Due to the high information costs of voters, politicians will try to develop a bundle of highly visible and easily understandable measures that benefit well-organised lobbies while their costs are distributed as broadly as possible, preferably even shifted into the future or abroad. Generally politicians like to label measures as climate policy that are concerned with other matters. They are interested in setting basic, easily understandable policy targets that lie in the far future, far beyond their term of office, and which are not necessarily realistic (Michaelowa, 1998a, p. 252).

Business lobbies play a major role in climate policy. Due to the complexity and broadness of the issue, politicians, bureaucrats and voters are in need of information that they cannot collect on their own without prohibitive cost. They make up two opposing groups: those losing and those gaining from climate policy.

Lobbies representing emitters’ interests will try to keep costs of climate policy as low as possible or even gain additional rents. Thus, they will favour subsidies and grandfathered permits while lobbying against taxes or auctioned permits (ERTI, 1994). Other favourite instruments are “voluntary agreements” that allow labelling of the autonomous rise in energy efficiency through cost-saving innovation as climate-policy-induced activity (Michaelowa, 1998a, p. 253). Regulation is tolerated as long as it is “controlled” by technological know-how of emitters.

¹ In 1996 the UN climate change secretariat listed almost 1000 instruments and measures of climate policy.

GHG emission abatement needs technological know how. Due to the oil shocks, energy savings and renewable energy businesses have sprung up and have set up lobby groups (“abatement lobbies”). These are still rather small but growing rapidly. Environmental NGOs focus on lobbying of the general population and thus concentrate on simple targets or single issues. Bureaucrats favour instruments that allow discretionary decisions, are subject to negotiation and are based on special information needs. This allows them to raise budgets and play a pivotal role in implementation. Thus, bureaucrats active in international climate negotiations are interested in “results”, i.e. targets and instruments.

Using public choice theory Michaelowa (1998b) showed that at the EU level, the climate policy process favours:

- strong international/EU-wide emission targets with a complex set of instruments;
- strong, non-binding national emission targets supplemented with weaker binding targets. The lower the per capita income the less stringent the target;
- national climate policy programmes tend to contain a big number of visible instruments and measures, many of which are just re-labelled or symbolic;
- instruments on a national level are inefficient and favour well-organised emitters’ and abatement interests. They tend to weigh most heavily on dispersed, non-mobile sectors or shift costs abroad.

Using Portuguese interest groups we will analyse their impact on national climate policy in the sections ahead.

3. EU climate policy and cohesion countries

The theory of public choice leads to the hypothesis that national emissions cannot be reduced strongly enough to reach the Kyoto targets, unless there is a “surprise” that allows the capture of “no-regret”² potential. This is politically very explosive as it endangers the reaching of the overall EU target. In this context, we analyse the role of the cohesion countries (Portugal, Spain, Greece and Ireland), which have been beneficiaries of structural environmental aid since Maastricht and focus on the particular case of Portugal.

After the Rio Summit a dilemma emerged: cohesion countries would be allowed to increase their relatively small CO₂ emissions but in this way they could not ratify the convention unless they could prove that other countries, or the EU as a whole, would compensate for their growing emissions with reductions elsewhere (Vellinga and Grubb, 1993). However, an informal agreement was reached and the EC ratified the convention in December 1993.

Presently European climate policy is following two main tracks: the burden sharing agreement (BSA), and common and co-ordinated policies and measures (CCPM, for an extensive list see Blok and Merkus (1997)).³ There were two distinct attempts to negotiate a burden sharing: one in 1997 to bolster the EU negotiating position at Kyoto and the second after Kyoto in 1998 (see Table 1). The latter agreement is seen as the EU’s first major step towards achieving its Protocol commitments.

² Actions which result in GHG limitations and abatement, and which also make good environmental and economic sense in their own right.

³ While some EU member states are currently developing innovative policies such as domestic emissions trading (UK and Denmark), others (e.g. Belgium) are lagging behind. However, compared to other Annex I countries, the level of policy implementation is quite high.

Table 1
Different EU burden sharing proposals and agreements across time and projected values from the FCCC's National Communications and MARKAL modelling (emission change from 1990 values in %)

Country	National targets for 2000	Original triptique 1997 ^a	Dutch proposal 1997	1997 agreement	UK proposal 1998	1998 agreement	Projected (UN-FCCC)	Projected (MARKAL)
Austria	–20 (2005)	–1 to –25	–25	–25	–20.5	–13	–	–
Belgium	–5	–12 to –15	–15	–10	–9	–7.5	–	10
Denmark	–5	–12 to –25	–25	–25	–22.5	–21	–23	6
Finland	–0	–4 to –7	–10	0	0	0	3.5	30
France	13	–4 to –12	–5	0	0	0	0	2
Germany	–25 (2005)	–17 to –30	–30	–25	–22.5	–21	–19	–20
Greece	25	–2 to 2	5	30	23	25	–	44
Ireland	20	–2 to –5	15	15	11	13	17	–
Italy	0	–5 to –9	–10	–7	–7	–6.5	–7	17
Luxembourg	0	–17 to –20	–40	–30	–30	–28	–40	–
The Netherlands	–3 to –5	–6 to –9	–10	–10	–8	–6	6	16
Portugal	40	16 to 21	25	40	24	27	40	24
Spain	25	6 to 11	14	17	15	15	20	18
Sweden	0	5 to 26	5	5	5	4	10	13
UK	0	–17 to –20	–20	–10	–12	–12.5	–6	–8
EU	0	–9 to –17	–15	–9.2	–8.5	–8	–	–0.2

^a Divides emissions into three sectors: domestic, electricity generation and heavy industry; range of four variants; Sources: EU Council (1997), European Commission (1994), Anonymous (1997, 1998), Gielen et al. (1998), UNFCCC (1998a), Ringius (1999).

Table 2
Emissions per unit GDP in the EU (t CO₂ per US\$ 1000, market exchange rate)

Country	1986	1988	1990	1992	1994	1996
EU average	0.53	0.50	0.48	0.46	0.44	0.45
% (1990 = 100)	110	104	100	96	92	94
Average of highest three countries ^a	0.93	0.88	0.88	0.84	0.79	0.72
% (1990 = 100)	106	100	100	95	90	82
Average of lowest three countries ^a	0.34	0.32	0.31	0.29	0.29	0.30
% (1990 = 100)	110	103	100	94	94	97
Average of cohesion countries ^b	0.65	0.64	0.66	0.67	0.65	0.62
% (1990 = 100)	98	97	100	102	98	94
Portugal	0.55	0.53	0.61	0.67	0.65	0.66
% (1990 = 100)	90	87	100	110	107	108

^a In the respective year.

^b Greece, Ireland, Portugal, Spain; Source: IEA (1998), own calculations.

CCPM gain further importance as national projections under business-as-usual (see Table 2) show that the BSA targets might not be reached unless stronger policies are taken. However, cohesion countries have been cautious towards the proposal of an EU-wide carbon/energy tax because they believe that the tax would have negative impacts on their economies (Ikwve and Skea, 1996; Ringius, 1999). Thus, Kyoto's flexible mechanisms (emissions trading, joint implementation and the "clean development mechanism" — CDM) could come into play and the Commission has already acknowledged their important role in meeting commitments at less cost, thereby safeguarding the competitiveness of EU industry (EC, 1998a).

3.1. Cohesion member states

The poorest member states of the EU will be allowed to increase their GHG emissions up to the year 2010 (within the BSA). Portugal, Spain, Greece and Ireland have a per capita GDP which is below 90% of the EU average and are therefore eligible for financial transfers (of monetary nature) from the cohesion fund which was agreed in the negotiations leading to the Maastricht Treaty (Haigh, 1996; Barrass et al., 1997). Cohesion countries seem to respond with an automatic demand for money and assistance when new commitments are entered into force. EU enlargement will upgrade current cohesion countries from poor to middle ranking (O'Riordan et al., 1999), thus losing benefits to the Eastern bloc, which will become receivers while the cohesion countries become contributors. Past emissions and efficiency development are shown in Table 2.

As Haigh (1996) pointed out, these countries form a distinct category for climate change purposes within the EU because:

- their per capita CO₂ emissions are relatively low (in an EU context);
- their combined contribution to the EU total of CO₂ emissions is fairly small (about 12%);
- there is a presumption that their relatively low GDP will increase relatively rapidly to achieve the goal of economic convergence.

Fig. 1 illustrates increases, up to the year 2000, for these countries. Emission levels in these countries depended more on the level of economic growth than on implementation of the measures in their national CO₂ strategies (EC, 1998b).

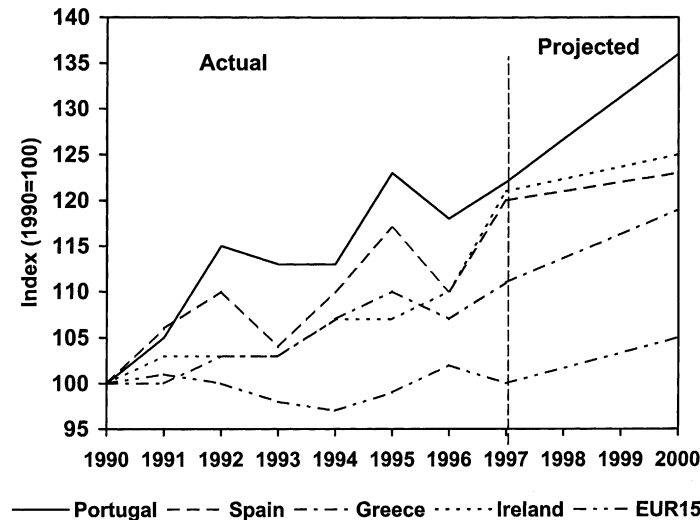


Fig. 1. Actual (up to 1997) and projected CO₂ emissions for Cohesion countries and EUR15 for 1990–2000. Actual emissions derived from Eurostat (1997b), IEA (1998) and WEC (1998), projected emissions from European Commission (1998d).

3.2. The burden sharing agreement

The BSA was initially devised in early 1997 using a “triptique approach”, which divides emissions (of CO₂ only) into three sectors: domestic, electricity generation and heavy industry (Blok et al., 1997; for a very detailed account of the burden sharing negotiations see Ringius, 1999). Cohesion country concerns were taken into account inasmuch as per capita emissions of the domestic sector were assumed to converge by 2030, leaving room for growth until then. Moreover, annual growth of electricity use was set at 1.9% instead of 1% for the other member countries. After Kyoto, with a new set of GHGs and different targets, the burden sharing was revised (see Table 1, Phylipsen et al., 1998), but ultimately the decision was political. Cohesion countries tried to block the strong targets proposed at the beginning of the first BSA negotiations round (second column of Table 1, Ringius, 1999, p. 146) which was taken into account by the Dutch proposal (third column of Table 1). However, when many member states, including those often perceived as environmental forerunners, wanted their targets to be made less stringent, Portugal and Greece also joined the race despite strong political pressure by the richer member states (Ringius, 1999, p. 151f). However, cohesion country negotiators wanted to prevent international criticism and thus accepted the proposal despite lack of feedback with interest groups at home. Ringius (1999, p. 156f) is startled by the lack of negotiation on side payments.⁴ However, one can argue that the availability of cohesion funds for abatement acted as a hidden side payment. The 1998 BSA decision was much less favourable to the cohesion countries than the 1997 version (see sixth column of Table 1) due to renewed pressure by the rich member states. Several analysts have tried to calculate a fair burden sharing. Gielen et al. (1998) calculated figures for equalising burden per unit of GNP and equalised marginal cost (see Table 3).

⁴ Side payments would be subsidies to states accepting more stringent targets.

Table 3

Emission change until 2010 under fair burden sharing rules (%) and ceiling of flexible mechanisms as percent of the reduction need from business-as-usual^a

Country	Equal burden per unit GDP	Equal marginal cost	Ceiling (% of reduction from BAU)
Austria	n.a.	n.a.	195
Belgium	1.1	−0.6	76
Denmark	1.2	0.1	248
Finland	18.2	12.1	57
France	−9.7	−8.0	260
Germany	−26.6	−25.8	244
Greece	36.7	26.5	19
Ireland	n.a.	n.a.	136
Italy	8.4	9.6	32
Luxembourg	n.a.	n.a.	54
The Netherlands	5.5	3.4	50
Portugal	15.6	9.6	30
Spain	7.3	3.0	108
Sweden	5.8	9.1	46
UK	−12.0	−10.8	72
Marginal costs	6.5–39, average 18	16	75

^a Source: Gielen et al. (1998), Betz and Eichhammer (1999).

These figures suggest that the burden sharing worked in favour of the cohesion countries. However, analysis of the actual policy framework as done below throws doubt on this calculation. Dessai (1999) has noted that Spain has already reached its GHG emission target, and is now considering an increase of its nuclear power as a possible remedy while Portugal is nearly at the edge of its target. Another policy issue that might be detrimental to cohesion countries is the proposed ceiling for the use of the flexible mechanisms. The second formula for acquisition of permits rewards countries with a high difference between Kyoto budget and maximal emissions in the period 1994–2002. This does not apply to cohesion countries whose budget is higher than their maximal emissions. Thus, those countries with a high business-as-usual growth after 2002 could only use the mechanisms to a much more limited extent than the other member countries. Calculations using projections from the second national communications are shown in the last column of Table 3.

4. Portugal's national context

To illustrate the problems of domestic climate policies in cohesion countries, the particular case of Portugal follows. Located in the west of the Iberian Peninsula, Portugal is a country with a mild climate, small population (9.9 million), and comparatively low per capita GDP. It joined the European Community in 1986, and has been deeply influenced by its policy ever since. Nonetheless, Portugal still has the EU's lowest GDP and remains both the EU's and Annex-I (developed countries and those with economies in transition) lowest per capita CO₂ emitter. However, CO₂ emissions per unit GDP have increased considerably in the last years, contrary to the overall EU trend, and also contrary to the average trend in cohesion countries (see Table 2).

Climate change entered the political agenda when Portugal signed the FCCC in 1992. This member state is heavily dependent on what is done at the EU level, to the extent that any policy adopted by the EU will be transposed into national legislation (Lacasta and Barata, 1997), but this does not necessarily mean that implementation is straightforward. At the time of the Earth Summit (1992) and during the negotiations that led to the adoption of the FCCC, Portugal had the EU presidency for the first time. Even though the Portuguese delegation was not appropriately prepared (especially in a national context), they were quite successful at the political and diplomatic level (Lacasta and Cavalheiro, 2000).⁵ In signing the FCCC, Portugal became responsible, as a developed country, for taking the lead in combating climate change and the adverse effects thereof. However, Portugal behaves almost as a “free-rider”, i.e. a country which benefits from carbon abatement by other nations (in this case by richer member states) without bearing the cost of restricting its own emissions. This might seem so, but effectively the 27% increase limitation (within the BSA) is viewed as an extremely ambitious objective (Barroso and Gonçalves, 1997). This is the picture portrayed by the emitters’ lobbies, specifically by “Electricidade de Portugal”, which has a dominant position in the electricity sector in Portugal. Ferreira (1998),⁶ argued that Portugal “will require a considerable effort, more demanding than those of other Member States”. In the aftermath of Kyoto, via this newspaper article she thus attempted to draw the voters’ attention to the effort Portugal will have to make. Worryingly, within the differentiation of the six-gases, CO₂ gets a 40% increase, but as Portugal has already increased CO₂ emissions by 36% (EC, 1998b), that would allow for an increase of only 4% between 2000 and 2010.⁷ At first sight, and bearing in mind the expected development of the Portuguese economy, this target seems highly unrealistic, unless, as Ferreira (1998) pointed out, Portugal starts to import electricity or automobile circulation is progressively banned up to 2010.⁸ However, observers from other countries have calculated business-as-usual until 2010 using a MARKAL model to arrive at +40% for CO₂, –11% for CH₄ and +9% for N₂O; the full basket gives +24% (Gielen et al., 1998, pp. 10, 15).

The change to a six-gas basket created an additional effort of 15% for Portugal, whereas for most member states it was 1–3%. This high difference for Portugal is caused by the relatively high share of CH₄ and N₂O in the three-GHG basket (Phylipsen et al., 1998). The application of a heating degree-day correction to the BSA calculations, and the omission of a cooling correction also played against southern countries.

4.1. Portuguese society

The Portuguese public in general do not yet perceive climate change as a major environmental problem (UNFCCC, 1996), but UNFCCC (1998b) concluded public awareness had a strong influence on the

⁵ It is worth mentioning that the more recent Portuguese EU-presidency (first semester of 2000) was well-organised, well-prepared and EU consensus was reached on some major issues such as: entry into force of the Kyoto Protocol by 2002 at the latest; the importance of a strong and comprehensive compliance system; clear and effective rules for the three Kyoto mechanisms; the non-application of Article 3.4 (other sink activities) during the first commitment period; and no sinks in the CDM (EU Council, 2000).

⁶ Former Portuguese Environment Minister.

⁷ A recent study by de Seixas (Co.) (2000) has shown that with an annual GDP growth of 3.3%, GHG emissions are expected to be 52% higher than 1990 levels by 2010.

⁸ A very pessimistic approach by a national politician, especially when compared to the usually optimistic and leadership-oriented EU-wide approach.

national policy-making process. A study by de Almeida et al. (1998) showed that half of the population has practically no knowledge of environmental issues and only a third of the other half seem to know what the “greenhouse effect” is (mostly due to the lack of domestic science base). Within the national context, Ribeiro and Rodrigues (1998), have stated that “we cannot think about the existence of a real environmental conscience . . . , but noticed an emergence of environmental awareness”. De Almeida et al. (1998) also showed that almost two thirds of the Portuguese population are not aware of the meaningfulness of EU integration for Portuguese environmental legislation as well as the environment in general (through cohesion and structural funds). This gives the overall impression that voters will not press for climate policy, mainly because they are uninformed about the issue, combined with the fact that local environmental problems (e.g. water and waste) are still to be solved, and hence are considered a priority. As Soromenho-Marques (1998) noted, Portuguese environmental policy has not been advancing due to civil society demands, but external pressure.

Regarding the impacts of climate change in Portugal, few studies have been performed to date. Detailed impact studies have just started, but it has been shown that the reduction of March rainfall in Portugal during the last 30 years, is statistically significant (Zhang et al., 1997; Trigo and DaCamara, 1999), having considerable implications for crop and water management.

Awareness of climate change and its impacts is a prerequisite for a climate policy to be successful (van Beukering and Vellinga, 1996). However in Portugal both are virtually non-existent, which is one of the reasons why Portugal is yet to be galvanised into action.

4.2. Institutional framework

Ribeiro and Rodrigues (1998) noted that Portuguese institutions are poorly prepared to face the new challenges of sustainable development, and the absence of an institutional co-operation model, based on interdependence (rather than on hierarchic relationships), further hinders the sustainability transition. Due to the holistic nature of climate change, which is comparable to the sustainability transition, it is noticeable that institutions as far apart as the Ministry of Economy and the Meteorological Institute have something to say about climate change, but very little integration has ever occurred.

Due to the lack of voters’ interests politicians so far have not addressed the issue. The election manifesto of the party currently in power (Partido Socialista, 1995) makes no mention of climate change as an environmental problem, with only a brief remark in energy policy, whilst the Government’s Programme (Presidência do Conselho de Ministros, 1995) makes no mention whatsoever. At present, major related priorities are water policy, urban environment, nature conservation and environmental education. Climate policy is only possible as by-product of policies to address these priorities.

In June 1998 an Interministerial Commission on Climate Change (ICCC) was established with the objective, *inter alia*, of elaborating upon a national strategy to be proposed to the Government, provide technical and scientific assistance to national delegations for Conference of the Parties (to the FCCC), and elaborate national reports on climate change. This means that a minimum interest of bureaucrats in the issue exists. It is too soon to assess the ICCC but the Government (Ministério do Equipamento, 1998) has already re-emphasised the need to reinforce the ICCC and develop a national strategy (which currently is non-existent) within the EU framework. O’Riordan and Jordan (1996) defined institutions as the vehicle through which any social change is mediated, and in the process of identifying and responding to threats or requirements for unexpected and unaccustomed co-operation, institutions themselves change. It is difficult to envisage such a change in Portugal (at least in the short term), as the relative immaturity of

the existing democracy and the still recent political and economic stability (Ribeiro and Rodrigues, 1998) pose a substantial institutional drawback. Yet, the UNFCCC (1998b) believes the IPCC will help improve political and institutional co-ordination, and strengthen implementation.

4.3. Greenhouse gas emissions and projections

Portugal almost doubled its GHG emissions in only 10 years (from 1985 to 1995). Data differ strongly depending on the source showing a high level of uncertainty. However, estimates of the Second National Communication (Portuguese Second Report — PSR, based on data from the Meteorological Institute (Ministry of the Environment, 1997)) are used for consistency hereafter.

CO₂ emissions are clearly dominated by two sectors, energy and transport, each one comprising about one-third of total emissions, with industry accounting for 21%. Waste is by far the largest methane (CH₄) emitter (more than 70%), followed by agriculture with a quarter of emissions. However, uncertainties are substantial. In the 1997 burden sharing negotiations, CH₄ emission data for 1990 were readjusted upwards by a factor of 4. That adjustment changed the business-as-usual projection by seven percentage points (Gielen et al., 1998, p. 22). More than half the nitrous oxide (N₂O) emissions originate from agriculture according to PSR. Other estimated GHGs are mainly emitted by the transport sector. It is actually the transport sector which has seen its GHG emissions rise substantially in the last decade.

The transport sector has been steadily increasing its emissions, even in 1993 (recession year) when both energy and industry's emissions dropped considerably. This sector doubled its emissions from 1985 to 1995 (Eurostat, 1997a), the main culprit being road transports (80% in 1994). The projections presented in PSR seem very inaccurate when compared with the actual trend. Available data, however, allowed the production of scenarios for future CO₂ emissions (Fig. 2).

The high growth (HG) scenario is based on a high economic development which would increase emissions by 76% in 2010. The business as usual (BAU) scenario would have a 60% increase while the national commitment (NC) scenario would restrict emissions to a 40% increase by 2010 (in accordance with the BSA). These scenarios have assumed a substantial increase in energy consumption in the domestic and services sector (which is in accordance with Moreno et al., 1996) and a decrease in road transports

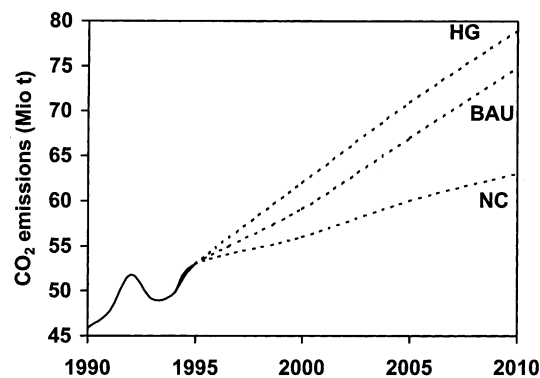


Fig. 2. Portuguese actual and projected CO₂ emissions for 1990–2010. Actual and business as usual (BAU) scenario derived from PSR (1997). High growth (HG) scenario and national commitments (NC) scenario from Lacasta and Barata (1997).

(which is in disagreement with the trend presented in Moreno et al. (1996)). According to PSR, CH₄ emissions will decrease 11% by 2010 while N₂O will increase by 5%.

4.4. *Policies and measures*

As public choice theory would suggest and UNFCCC (1998b) noted, there is no real climate policy in Portugal, merely unconnected policies and partial measures scattered around different sectors with no integration in mind. If at all, policies are implemented due to availability of EU funds — thus costs are shifted abroad. According to PSR, in the agricultural sector, the EU's Common Agriculture Policy has reduced N₂O and CH₄ emissions through a less intensive agricultural activity. Forestry policy is believed to have reduced CO₂ net emissions by acting as a sink, through afforestation. Among energy policies, significant measures include the introduction of natural gas (since 1997; the government's major plan to reduce emissions), intensified use of renewable energy resources, improvement of energy efficiency, and use of more sophisticated technologies. Table 4 summarises policies and measures taken by the energy sector and the estimate of their mitigating effects.

The introduction of natural gas might reduce CO₂ emissions but on the other hand it might also increase CH₄ emissions (a more powerful GHG), through leakage from its distribution network (EEA, 1999). In any case, gas use is a “no-regret” policy. The promotion of renewable energy seems to have been greatly neglected, especially solar energy which has an enormous potential in Portugal. So far, there are no abatement lobbies. This contrasts strongly with neighbouring Spain. Around one-third of electricity generation arises from a particular renewable source, hydro energy, which represents 7% of total primary energy supply (TPES) and 90% of renewable energy generation (IEA/OECD, 1996). The only other significant renewable energy source is biomass, which contributes 6% of TPES. However, wind energy has been making remarkable progress recently, rising from 19 MW installed capacity in 1996 to 39 MW in 1997 and 60 MW in 1999 (BTM Consult, 1999). However, the indigenous wind power lobby is still small and most parts are imported.

The main problem for Portuguese climate policy is that Portugal still remains the member state with the lowest energy efficiency (Lacasta and Barata, 1997), which is actually deteriorating due to low energy prices. Energy consumption has been increasing more rapidly than economic growth, leading to a rapid increase in energy intensity (IEA/OECD, 2000). Primary energy intensity has risen by almost 20% from 1985 to 1996. This is not a phenomenon limited to the industrial sector: Energy use per employee in the service sector has been growing sharply in the first half of the 1990s (Odyssee, 1999). In contrast to Spain which has a strong energy efficiency programme (IEA, 1997, p. 433ff), in Portugal no co-ordinated policies exist (IEA, 1997, p. 404f). In the building sector there is talk about a voluntary efficiency rating but no mandatory standard. In the industrial sector, since 1982 firms above a threshold of 1000 toe annual energy use have to develop 5-year energy use plans that are to be approved by the Directorate General for Energy with a target of reducing specific energy consumption by 1% per year. Savings achieved in 1998 are estimated at 33 ktoe (IEA, 1999, p. 161). Moreover, the Regional Incentive System for the Rational Use of Energy subsidised energy audits, energy efficiency projects and cogeneration with a total sum of US\$ 0.1 million for 1994–1998, yielding 245 ktoe savings (IEA, 1999, p. 162).

Regarding transport policies, PSR makes no mention of the sector that grew 67% over the last 10 years and is the main sector responsible for Portuguese GHG emissions growth. The only present measures that stand out are the control of vehicle emissions through obligatory periodic inspections and the late, but still significant, investment in rail transports, mainly financed through cohesion funds.

Table 4
Summary of policies and measures for the energy sector, and their mitigating effect for 2000, 2005 and 2010 (in 1000 tonnes of CO₂)^a

Policy/measure	Type of instrument	Sector	State of implementation	2000	2005	2010
Energy diversification (introduction of natural gas)	Financial incentives; legislation and cooperation	Supply of energy	At implementation stage	3400	5600	11200
Promotion of renewable energies (wind, mini-hydro, geothermal and biomass)	Financial incentives, fiscal incentives and legislation	Production of electricity and use as thermal source	Implemented and legislation approved	600	700	800
Promotion of energy efficiency	Financial incentives and legislation	All sectors of activity	Implemented and legislation approved	500	1000	1200
Total				4500	7300	13200

^a Adapted from PSR (1997).

Portuguese climate policy could be improved taking into account some of the constraints shown by the public choice analysis:

- bundle competencies for climate policy in the Interministerial Commission on Climate Change and allocate it a fixed share of cohesion funds;
- start awareness building in the general public and foster environmental NGOs to increase voters' and abatement interest groups participation in the process;
- develop a strong programme on energy efficiency using revolving funds to reduce the barriers to “no-regret” options.

5. Conclusions

The EU's initiative and perseverance have shaped international climate policy. However, due to activities of interest groups, domestic action, an area which the EU has strongly defended, is proving difficult to carry out, particularly for cohesion member states. Although their behaviour resembles free-riding, at least in an international dimension, cohesion country targets are actually challenging in the face of their economic boom.

Portugal took one of its most ambitious stands ever, in environmental protection, by limiting its GHG emissions to a 27% increase up to 2010. Current projections do not show that Portugal is capable of achieving its target unless more stringent policies are implemented (UNFCCC, 1998b). The lack of a domestic science base, the underdeveloped institutional capacities and the lack of abatement interests accompanied by the rapid economic and road traffic growth are the main causes of the inefficiency of current “quasi-policies”. Additional measures are required if Portugal is not to stay adrift in this battle against climate change.

This Portuguese case study holds several lessons for both European and international environmental policy. First, if Portugal is unable to comply, it will shatter what the EU has been seeking for so long; a consistent environmental policy. If other cohesion countries are in the same circumstances, the risk that the EU as a whole fails to reach its Kyoto targets rises considerably. To reduce this risk, the EU could try to introduce strong enforcement rules and sanctions to prevent member states overshooting their targets. This will be extremely difficult as past efforts to enforce EU regulation have shown. A second way may be to use EU enlargement to increase the bubble by the accession countries and thus gain a safety margin. However, this will only be possible until the EU ratifies the protocol and would thus have to be negotiated quickly. Moreover, it would give an incentive to reopen the overall burden sharing negotiation. The third and easiest way would be to give the EU Commission the power to buy emission permits from abroad if the target is not reached and reduce EU transfers to those countries that have not reached their target proportionally to their degree of non-attainment. This would open a safety valve while leaving an incentive to countries not to default on their target. However, the current emphasis of EU negotiators on limiting acquisition of permits would have to be abolished to make this strategy possible.

It is imperative for the EU to show that it can cope with sharing a burden between 15 parties. Otherwise, the FCCC will have twice the trouble in having parties achieve their Kyoto commitments. The EU bubble is an excellent laboratory to study problems that will arise with burden sharing in the international arena.

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