

Behavioural motives within European climate policy and their implications for the fulfilment of the European Kyoto target

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1 Introduction

After Russia's ratification of the Kyoto-Protocol and its coming into force on February 16th 2005, greenhouse gas emission targets finally became legally binding. In view of this development, international policy makers as well as the public are looking to Europe to see the status of compliance within this group of countries which has pushed the Kyoto process forward since its beginning in 1997. They will definitely be disappointed: the EU as a whole is still far away from achieving its greenhouse gas reduction target of minus 8 percent until the first commitment period from 2008 to 2012 (based on 1990 emissions). As figure 1 shows, some countries (mostly the UK and Germany) are already close to meeting their individual reduction targets, which they were attributed within the European Burden Sharing Agreement, while other countries are far away from achieving their targets or are even going in the wrong direction by considerably increasing their emissions (see EEA 2004). The question arises if the motivation in those countries which are close to achieving their targets and which carry out an effective climate policy can be other than in the countries which are still increasing their emissions.



Figure 1: Reduction targets and necessary reductions based on emissions in 2002

Source: EEA 2004a, p. 57 and EEA 2004b, p. 59.

A second development which brought climate policy back into the focus of policy makers is the discussion on future climate change policy and the continuation of the Kyoto Protocol after 2012. Since the beginning of the year 2005, discussions on a second commitment period have intensified. Although a lot of discussion is focusing on the question of how the US and the big developing countries can be integrated into the Kyoto process, the EU member countries are discussing the further role of the EU, and are divided in respect to some aspects of the question of continuing the Kyoto Protocol post 2012.

Just before the spring session of the EU environment ministers in March 2005, a presidency proposal was issued by Luxembourg which pushes for 15-30% reductions to be targeted by 2020 and 60-80% by 2050 compared with 1990 levels. A group of countries, lead by Germany and the UK, strongly supports this proposal. The German environment minister stated that Germany will take on a 40% reduction target for 2020 if the EU as a whole takes on a 30% target. However, a minority of EU member states are against quantified targets for a future commitment period. Leading this camp are Italy and Finland, with support from Spain, Portugal, the three Baltic states, Poland, Slovakia and Cyprus (see ENDS 2005). Despite the arguing of these states, EU environment ministers committed themselves to further reduction targets on their session on March 10th, 2005 (see Council of the European Union, 2647th Council Meeting Environment). However, the discussion on future commitments will continue in the EU as the general attitudes towards climate change policies still differ widely. The discussion on further commitments again suggests that there are different motives within the EU.

Bearing in mind the fact that the EU Member States converge towards a common ground in many issues and policy areas (e.g. economic and monetary policy), the question arises why the situation within the field of climate policy is so different in EU member countries. Apart from having different motives within climate change policy, it is argued that the different achievements in reducing greenhouse gas emissions can also be due to external factors. Also, in some cases, the motivation to get active in climate change policy, or rather to keep reluctant, itself can be traced back to external factors.

This essay takes up both points – motivation and external factors – to derive an appropriate assessment of the current situation of European climate policy which can help policy makers decide on future policies and measures. In the first part, pusher/leader as well as dragger motives and their theoretical background are derived. It is shown that theoretical models which, in some cases, go beyond pure economic thinking, can describe different motives which range from a pure free-rider position, to a "pragmatic" dragger position to a potential and even pure leader position. Chapter 3 then shows which of the motives can actually be found in different EU countries. As it is difficult to assign countries to only one single motive,

Chapter 3 focuses first on important policy fields for which the different motives can be applied before the analysis is taken to the country level, and also brings the second aspect, the external factors, into view and shows their influence on greenhouse gas emissions in selected EU countries. The conclusion discusses options to improve the emissions situation in the EU, especially in the dragger countries. It also gives hints to which way the findings of this study can be extrapolated to the international level.

2 Behavioural motives within European climate change policy

2.1 Motives for free-riding – game theory and climate policy

Because of its global character, climate policy is a field that requires a co-operative behaviour from all countries. The United Nation's Framework Convention on Climate Change (UNFCCC) of Rio in 1992 and the drawing up of the Kyoto Protocol show that countries have in general recognised this need to co-operate. These and other environmental co-operations and agreements can be explained with the help of game-theoretical approaches which analyse interactions of different actors (see Finus 2002, p. 9). Game theory explains why environmental agreements are necessary to prevent countries from free-riding and can show – within the frame of EU climate policy and the EU-Bubble – how the design and regulations of an agreement can have an influence on the behaviour of involved countries.

Without any agreement, climate change policy would face the problem that is characteristic of all other (global) public goods. Public goods typically have a high degree of externalities – positive or negative effects that come along with providing the public good but are not included in a cost-benefit analysis. If, in the case of climate change policy, country A decides to reduce GHG emissions, this brings along benefits for country A but also for all other countries. But when weighing costs against benefits of climate change policy, country A only includes the benefits to its own territory in the analysis. The benefits in all other countries are ignored. A second characteristic of public goods is that nobody can be excluded from their usage. For the example of climate change policy, this means that countries can benefit from other countries or individuals is therefore to benefit from the public good (better environmental situation through the reduction of greenhouse gas emissions) without making a contribution.¹ If all countries behave like this and act as free-riders, the public good (climate

¹ For an analytical description of this situation see for example Krumm 1996, pp. 11.

change policy) is not realised, although it is generally appreciated by all of them. This is the typical case of the prisoner's dilemma.

The prisoner's dilemma is a fundamental scenario in most game-theoretical models and also serves as a starting point for this analysis. Table 1 gives an example of such a model. In this example, country A and country B decide independently from each other (isolated from each other) whether or not they want to adopt the "cooperate" strategy or the "defect" strategy. The different possible combinations of strategies and their payoffs are show in table 1.

Country B							
		Cooperate (C)	Defect (D)				
Country	Cooperate(C)	4;4	-1;5				
A	Defect (D)	5;-1	0;0				

Table 1: Matrix of payments for the prisoner's dilemma

If both countries adopt the "cooperate" strategy, both have a net benefit of 4. If country A decides to defect while country B cooperates, country A can achieve a higher benefit of 5. On the other hand, country B faces higher costs than benefits. If both countries decide to defect, both countries have neither benefits nor costs.

As the strategy of the other player is unknown, the "defect" strategy is the dominant strategy for both players. The (D,D) strategy combination, which has the (0;0) payoffs, is the so-called Nash-equilibrium of this game. However, the matrix of payoffs shows that this is not an efficient outcome. Both countries would be better off if they adopted the "cooperate" strategy. The combination (C,C) with the payoff (4;4) is a pareto-improvement to (D,D).

This shows that as long as countries have to decide on their strategies without consulting each other, like two prisoners, and as long as they are not able to change their strategy after observing the other country's strategy (as long as the game is a "one-shot game") there will be no cooperation, and no country will engage in climate change policy. However, this situation is not an appropriate description of the European climate policy. The assumptions that have to hold for the prisoner's dilemma do not apply in the case of European climate policy.

- Assumption 1: "one-shot game", but: European climate policy covers several periods so that the behaviour of other countries can be observed and can be taken into account within further negotiations.
- Assumption 2: "Isolation", but: EU countries can cooperate and try to obtain information on the "strategies" of other countries. There are regular meetings of the environment ministers of EU Member States.
- Assumption 3: Sanctions and transfers are not taken into account in the prisoner's dilemma because of the isolatedness and the missing possiblity to cooperate, but: the compliance with targets of the EU burden sharing agreement could possibly be secured with the help of sanctions and transfers.

Therefore, these assumptions will be left behind one after another in the following analysis so that in the end a more appropriate description of the EU climate policy can be derived.

As a first step, the unrealistic assumption of a "one-shot game" is dropped, and the game is continued over several periods. The total game is itself a repetition of the single stage game described above (see Holler/Illing 2003, p. 135). In the case of repeated games, a difference has to be made between the case where a game is endlessly repeated and the case of a limited time period. With the decision of EU environment ministers on their 2005 spring meeting, it becomes clear that the EU will take over further reduction targets after the end of the first commitment period. Consequently, an endless time horizon is assumed.²

The following analysis sticks to the matrix of payments presented in table 1 for the prisoner's dilemma. In the one-shot case, the stage game only has one Nash-equilibrium, namely (D,D). However, if the stage game is continued over an endless time period, a cooperative solution with the pareto-optimal outcome (C,C) can theoretically be achieved. Compliance with the cooperative solution is made attractive with the help of a retaliation strategy. The players agree implicitly or explicitly that they will adopt the "cooperate" strategy in all periods as this strategy brings along a higher payment than the Nash-equilibrium does. As soon as one player breaks this rule in order to achieve a short-term advantage (a payment of 5 instead of 4), all other players play the Nash-solution of the stage-game (D;D). This strategy is known as the "trigger-strategy" (see Holler/Illing 2003, p. 138). It becomes clear that a player only deviates from the agreement if the short-term benefits are higher than the losses from periods in which the retaliation strategy is played (where he gets a payment of 0 instead

 $^{^{2}}$ A limited time horizon which assumes that the current EU climate policy will stop at a certain point of time is more pesimistic and at the same time not worth discussing in this analysis. As all countries can not be sanctioned by their co-players (in the way that they also defect), they all play strategy D to maximise their profit. Foreseeing this behaviour, all players act the same as in the last period, as the strategy of the other player is anticipated. This argumentation can be continued until the first period t=1 (see Holler/Illing 2003, p. 137).

of 4). This seems to be an unrealistic strategy in the case of climate change policy, as dangers and costs that come along with climate change and with a deviation from the cooperative strategy are estimated to be very high and to accumulate over time (see for example European Commission 2005, pp. 21; Kemfert 2004 and 2005).

With the help of this retaliation, or "trigger" strategy, a pareto-optimal situation in which both countries co-operate can be achieved. However, the optimal level of emission reduction which comes along with the cooperation is only achieved if short-term benefits of free-riding do not outweigh the (discounted) welfare losses that would result from the retaliation strategy. If this holds for both countries, the threat of the trigger-strategy is plausible and the game becomes stable. The countries maximise their payoffs through co-operation and not by acting as free-riders. However, the threat of the trigger-strategy is plausible only if the game is stable to new negotiations. As in the present example not only the deviator but also the retaliator is worse off through the retaliation, it is highly possible that the two countries will renegotiate the situation and turn down the earlier threat-strategy. The possibility of such a renegotiation undermines the credibility of the original threat and questions the feasibility of the pareto-optimal solution (see Holler/Illing 2003, p. 155). This case of re-negotiation is highly possible in the EU, as similar situations in other policy fields have seen re-negotiations. The best known and most up-to-date example is the Stability and Growth Pact, which has been changed after several important Member States were about to face sanctions originally agreed upon within the Pact. This shows that relaxing the first assumption is not enough and, theoretically, countries still have an incentive to free-ride.

To get closer to the "real" European Climate Policy situation, assumptions two and three are also left behind. Up to now, the analysis did not consider that EU countries do not have to decide on their strategies in an isolated way, without knowing what the other countries are doing. In reality, they can exchange information during bilateral meetings as well as within the European institutions (mostly the Council of Environment Ministers). The theory of co-operative games clearly shows that a co-operative welfare level (co-operative solution) can only be achieved if there is an outside authority that makes sure that deviating behaviour is sanctioned. All countries have to commit to a special behaviour with regards to this authority. Only if all countries accept the authority and its sanctions will the cooperative solution be an optimal solution in which none of the countries has an incentive to act as a free-rider (see Holler/Illing 2003, p. 190).

Although regulations on sanctions exist within the Kyoto-Protocol,³ these sanctions are not sufficient to prevent free-riding within the EU. The regulations on bubbles in the Kyoto-Protocol (article 4) make clear that only the fulfilment of the bubble's target counts. If the EU as a whole achieves its reduction target of minus 8 %, then it does not matter if some countries did not fulfil their individual commitments. Shortcomings in some countries can thus be compensated by other countries, and the countries which did not achieve their targets do not face any sanctions. If some countries speculate on this situation (and assume that for example the UK, Germany, Sweden and other countries overachieve their individual reduction targets), they still have an incentive to act as free-riders as they do not expect to be sanctioned. However, they will be sanctioned if their assumptions were wrong and the EU as a whole does not achieve its target. To make sure that these incentives to free-ride are prevented, the EU could implement additional sanctions for countries that do not fulfil their individual targets within the European burden sharing agreements. Although such sanctions have already been discussed, they could not yet be put through (see Michaelowa 2004). It has to be taken into account that these sanctions have to outweigh the costs of complying with reduction targets, otherwise countries - especially those with high costs of avoidance will still not act in a co-operative way.

Within game-theoretical analysis, it is furthermore discussed how transfers to disadvantaged countries could be used to ensure their co-operative behaviour. This could include direct monetary transfers. At the same time, this could imply that different policy areas are linked with each other so that transfers are more indirect. This would mean that countries with high opportunity costs of avoidance - mostly the cohesion countries, or smaller countries where the costs of development and implementation of climate policy measures are disproportionally high - are compensated for their costs. Although such transfers have already been discussed at the EU level (see Michaelowa 2004), it was not yet possible to come to an agreement. Instead, there is indirect support for disadvantaged countries. For example, the European Commission initiated the European Climate Change Programme (ECCP) which, amongst other objectives, tries to identify cost-effective measures to reduce greenhouse gas emissions (see European Commission 2001). Furthermore, payments from the cohesion fond can be identified as indirect support payments (see Dessai/Michaelowa 2001, p. 332). A well-fit design of coexisting transfers and sanctions could thus guarantee that all EU countries behave co-operatively and work toward the fulfilment of their Kyoto commitments.

³ If a country does not meet its Kyoto-target, it has to make up for those missing reductions which are multiplied with a factor of 1,3 in the next commitment period (see Michaelowa 2004).

Up to now, the weak design of sanctions in the EU leads to the fact that there are still incentives to act as free-riders which are especially high for countries facing high avoidance costs. Acting as free-riders, they try to make clear that costs of meeting their targets are especially high, and that this brings along a competitive disadvantage (see Kroeze-Gil/Folmer 1998, p.166). Countries which choose that strategy hope that they can put through additional regulations on transfers or secure a comparatively low reduction target for a second commitment period.

Pure free-riding is always due to opportunistic behaviour within which a country wants to take advantage of the co-operative behaviour of other countries. Free-riding in the field of climate change policy means that a country wants to profit from greenhouse gas reductions in other countries, and at the same time wants to achieve a competitive advantage through the fact that it does not engage in costly reduction measures (see Cansier 2004, S. 201). Free-rider countries typically pursue symbolic policy to make other countries and their population think that the problem of climate change is and will be tackled. Looking closer at what those countries actually do, it becomes clear that they do not really intend to implement and carry out any measures. Instead of implementing effective climate policy measures, a free-rider tries to deceive other countries and their population (see Karl 2000, p. 183).

2.2 Other motives to act as dragger – "late starters" in European climate change policy

If a country does not undertake any or insufficient efforts in climate change policy, this reluctance does not necessarily have to be identified as free-riding. Shortcomings in climate change policy can also be explained by the fact that a country first needs to fight other problems, or that it wants to avoid new problems which could come along with the implementation of climate change measures. Governments do not primarily focus on climate change, but they have to consider several target variables in order to optimise public welfare (see Bayer/Cansier 1999, p. 261). As the effects and risks of climate change are still difficult to assess and are only relevant for today's population in a limited way, the problem of climate change is often lined up on a less important rank on the priority list when other problems occur.

The push for economic growth and the fight against unemployment especially are two policy fields which most often get a higher priority than climate change policy. If a country is in an economic recession or faces a high rate of unemployment, it will hardly invest any additional budget into climate change policy. However, this does not necessary mean that the country acts as free-rider.

This behaviour can especially be observed in the EU cohesion countries who saw a very high rise in greenhouse gas emissions since 1990. For these countries, the economic rapprochement towards the "old" EU countries was the focus of their policy since they entered the EU. Strengthening the economy and reconciliation of budgets was also important for them to meet the convergence criteria in order to participate in the European Monetary Union. So, it would be unfair to identify those countries as free-riders in climate change policy only because they did not give it a high priority. They could also be "late-starters", which would imply that they have to give climate change policy a higher priority as soon as solutions for more pressing issues are found. Only after a detailed and in-depth analysis of the behavioural motives and policies of a country can it be said that one is a free-rider or only a "late-starter". Identifying the real motives also plays an important role for relations between EU countries. After all, it makes a big difference if a country is not able to fulfill its reduction commitment or if it only wants to achieve a strategic advantage over other countries (see Cansier 2004, p. 202).

However, , it is empirically difficult to distinguish a "late starter" from a real free-rider. In general, a free-rider can always argue that the country was facing more pressing problems, and that it therefore had to give climate change policy a lower priority and that it will start to implement an effective climate change policy as soon as possible. To verify such a statement, an in-depth analysis of motivation in this country would be necessary. This would imply tracing back the motivation to the beginning of the international climate policy process.

2.3 Competitive advantages and altruism – Leaders in European Climate Change policy

The game-theoretical analysis has shown that under the currently valid regulations of the international and European climate change policy there is an incentive to free-ride. However, there are countries whose behaviour is obviously no free-rider behaviour, but which have pushed the process of international and European climate policy forward. So, for example the United Kingdom (UK) has contributed to the development of the international and European framework, and is furthermore on the way to overachieve its reduction target. At the moment, the British government is working towards a reintegration of the USA into the Kyoto process. The question arises how this behaviour can be justified after game-theory has shown that free-riding is the dominant strategy.

This behaviour can be explained by the idea that demanding regulations in environmental and climate change policy can act as motor for economic modernisation and can serve to improve the competitiveness of a country. Economy and ecology are no longer two rivaling areas but can go hand in hand. This idea goes back to the so-called Porter-hypothesis, which states that a strict environmental policy can get firms to innovate and to improve their energy efficiency (see Porter 1991, p. 625). This contributes to the improvement of international competitiveness (see SRU 2002, p. 75).

This improvement of competitiveness can be explained by two mechanisms. Porter/van der Linde (1995, p. 120) find that "properly designed environmental standards can trigger innovations which lower the total cost of a product or improve its value". Within this so-called innovation effect, environmental regulations can lead to the implementation of products and production processes which are both environmental friendly and save resources. These innovations are not only an advantage for the whole economy's competitiveness, but also lead to cost reductions for individual firms which can over-compensate the compliance costs. Furthermore, it is assumed that domestic industry gets an additional advantage if the stricter domestic environmental regulations are also applied in other countries or even at the international level. In contrast to their foreign competitors, they already implemented necessary measures to meet the regulation so that they have a first-mover advantage. In addition, there are new export markets for producers of environmental technologies (see SRU 2002, pp. 75). Even as these effects might also be possible without the environmental regulation, Porter/van der Linde (1995, p. 127) think that the additional pressure of the regulation is fundamental: "The belief that companies will pick up on profitable opportunities without a regulatory push makes a false assumption about competitive reality - namely, that all profitable opportunities for innovation have already been discovered, that all managers have perfect information about them, and that organizational incentives are aligned with innovation."

Although the Porter-hypothesis has been subject to heated discussions, several studies show its relevance. Studies on the competitiveness of economies as well as of individual firms and industries show that there is a positive correlation between environmental regulations and environmental innovations (see Northrop 2003, p. 4; Porter/van der Linde 1995, p. 125). This idea of competitive advantages through environmental regulations also plays an important role in the EU climate policy. As the EU as a whole sees itself as a leader in the international context, European countries can achieve early-mover advantages on other countries. To make this strategy work, the Kyoto-Protocol has to be continued after 2012, and other countries (especially the USA and the big developing countries India and China) have to be integrated into the process.

While this explanation of leadership behaviour is based on the assumption of profitmaximising actors (homo oeconomicus), a transition to altruistic actors gives a second explanation of this behaviour. Under the assumption of altruistic actors, an effective climate policy is justified by the fact that future generations have to be saved from the risks of climate change. It is known that, even if they are already perceived today, the effects of climate change will mostly affect future generations (see IPCC 2001, p. 9). That is the reason why the total economic value⁴ considers not only use values, but also non-use values which can be explained by altruistic behaviour. The "bequest value", which describes the benefit of special environmental goods for future generations, considers the responsibility towards the coming generations (see Cansier 1996, p. 82).

Those two explanations show that free-riding, which is characterised by game-theory, does not need to be the dominant behavioural strategy in the field of climate change policy. Apart from altruistic motives, there are also rational motives which can make a leadership initiative seem profitable.

2.4 Theory of New Political Economy – Potential leaders in European climate change policy

However, it becomes clear that leader countries often do not live up to their promises and potential, and achieve their climate change targets only scarcely or insufficiently. Although Germany has achieved a high reduction of greenhouse gas emissions in the 1990s, it is now struggling to bring emissions further down. The Minister for the Environment, Jürgen Trittin, is still arguing that Germany plays a leadership role in climate change policy, but in fact Germany missed its national reduction target for 2005 which implied a reduction of CO₂ emissions by 25% from 1990 levels. The situation in the UK is similar but not as obvious. These observations can be explained by the theory of New Political Economy, which analyses how different groups within society influence policy making. The field of climate change policy is especially prone to distortions through interest groups, as there is a great number of actors involved, and because of its global focus and long time horizon (see Michaelowa 1998, p. 1). Social interest groups play an important role in the climate change policy process, which often leads to the situation where there is a gap between the original commitment of the government and relevant ministry and its action, namely the implementation of effective climate change measures.

In the frame of environmental and climate change policy, it is mostly the (emitting) industry which is able to push its interest through. In contrast, the interests of the European population seem to play a less important role. Even green parties, who take over important positions in many EU countries and are even a member of the government in Germany, as well as environmental NGOs are not powerful enough to articulate the interests of the

⁴ With the help of a total economic value, the stabilisation of the climate as a whole, or the saving of individual environmental goods which are endangered by climate change, can be valued.

population and to put this interest through the political process. Additionally, producers of renewable energy technologies could not yet establish themselves as powerful opponents to the emitting industry. The question arises why and how different interest groups become influential within the political process, and how the political system itself considers different interest groups so that the political process becomes distorted.

Two fundamental conditions for the emergence of interest groups and their acceptance were first formulated by Offe (1969). The first criterion characterises the organisational ability of interests. Social needs and interests can only be organised if there is enough motivation and resources to found an association or other instrument to represent the interest. Therefore, the organisational ability of an interest can only be guaranteed if there is a special group of people who want their interest to be represented through a political representation. Only interests which can be seen as special needs of a group can be organised (see Offe 1969, p. 168).

To gain influence on the political process, social groups also need to have a conflict potential. This conflict potential relies on the ability of an organisation to collectively refuse their contribution/work, or at least threaten to do so. In order to maintain this conflict potential, associations and organisations have to make sure that they do not overstress the threat of refusing their contribution/work. Otherwise, it will no longer be seen as an exception but becomes an on-going confrontation (see Offe 1969, p. 169f.).

Because of the organisational ability, and especially because of the conflict potential, an institutionalised priority scheme emerges within a society. Groups that have a higher conflict potential than others can obtain a more important position in this priority scheme than groups which have no or only little conflict potential. The political systems gives a priority to the needs/problems of an interest group whose strike potential brings along the highest cost (risk) (see Offe 1969, p. 183).

For the case of climate change policy the characteristic features of organisational ability and conflict potential seem to fit most clearly to the interests of the emitting industry. It is easy to show that this group is easy to organise: all companies want to maximise their profit and therefore work against new environmental instruments and measures which are likely to bring along new costs.⁵ In contrast to the group of consumers which have a high preference for a clean environment, the interests of the emitting industry also have a high conflict potential. The best example is the common threat to move production facilities to countries

⁵ Although the Porter-hypotheses suggests the existence of competitive advantages through environmental regulations, most companies do not seem to trust this hypotheses and still see a trade-off between economy and ecology.

with lower environmental standards, which would mean a loss in GDP and employment for the domestic country. So, for example the US Global Climate Coalition initiated a 13 mio. US-\$ campaign against the ratification of the Kyoto-Protocol which stated that through the ratification of the Kyoto-Protocol 1,5 million jobs would be at risk (see Michaelowa 1998, p. 17). Similarly, the Union of Industrial and Employer Associations of the European Communities (UNICE) fought against strict regulations and too tight allocations in the frame of the European emissions trading system (e.g. it fought against an auctioning of first certificates and the prohibition of banking) (see UNICE 2004, pp. 1). During times of high unemployment and the fight for the most attractive industrial locations within a globalising world, this conflict potential is so powerful that the emitting industry – sometimes supported by trade unions – mostly pushes its interests through.

On the other hand, the interests of producers of renewable energy are organised, yet they do not have the necessary conflict potential. In addition, they could not yet fully establish themselves within the political priority scheme, so that they are not able to compete with other interest groups which have a tight place within the priority scheme.

This influence of interest groups can lead to a situation where even countries which see themselves as leaders sometimes do not consequently implement climate policy measures so that they can actually only be seen as potential leaders.

The theoretical analysis of possible behavioural motives within climate change policy shows that there are four different positions which can be taken. Figure 2 gives an overview of the two groups "pusher" and "dragger" and of the subgroups, as well as their importance within European Climate Change policy.



Figure 2: "Pusher" and "dragger" and their motives and roles within climate policy

3 European climate change policy in practice – the behavioural motives' relevance to important policy fields

All of the theoretical motives can be found in EU Member States as well as in different fields of climate change policy. As in most of the countries, several different motives can be observed, this chapter first focuses on some important fields of climate policy – use of market-based instruments, support of renewable energies and use of Joint Implementation (JI) and Clean Development Mechanism (CDM) – before going one step further to explore the national level. Based on the findings of this chapter, the conclusion derives proposals for policy makers taking into account the external factors. The analysis includes Germany, the United Kingdom (UK), Italy and Spain, as they are – apart from France – the biggest greenhouse gas emitting countries in the EU.

3.1 The use of market-based instruments in climate change policy

A field that can most clearly show the motives of a country's climate change policy is the design and the level of implementation of policy measures and instruments. Within the range of instruments, pusher behaviour is aligned with the use of market-based instruments which,

according to the Porter-Hypothesis, are supposed to stimulate innovation and modernisation, and which make sure that greenhouse gas reductions are achieved effectively. On the other hand, good evidence for late-starter and free-rider behaviour is the lack of market-based instruments and a concentration on voluntary agreements. Such agreements are often not efficient in terms of costs and benefits, and in some cases tend to be merely a symbolic action (see Karl 2000, p. 183). In general, an instrument can be identified as being effective if it stipulates an improvement in energy efficiency which brings along reductions in greenhouse gas emissions.

Germany and the UK both introduced a tax which is supposed to bring along an emission reduction and channel the general behaviour towards energy-savings. In order to strengthen the steering effect, producers of energy from renewable resources and combined heat and power are partly excluded from the taxes in both countries.⁶ The German "Ecological Tax" Reform" (Ökologische Steuerreform) of 1999 brought along a rise in energy and fuel taxes and introduced an electricity tax which was furthermore raised in four annual steps until 2003. The British "Climate Change Levy" mostly meant a rise in energy prices for industry and the public sector. The UK and Germany since belong to the European leaders in terms of energy and fuel prices, and in both countries the ecological/climate tax is supposed to bring along а significant reduction in greenhouse gas emissions (vgl. Bach/Kohlhaas/Praetorius 2001, p. 2; DEFRA 2004, p.1). Although this seems to be evidence of leadership behaviour, the great number of exemptions for industry which were pushed through by big industry lobby groups show that, mainly in Germany, the potential leadership behaviour plays an important role as well in the case of economic instruments.

In both countries, the economic instrument of taxes is supplemented by a voluntary agreement. In Germany, the "Climate Protection Declaration" (Klimaschutzerklärung) of German industries from 1996 has been substantially refined in 2000 to match the new circumstances. The British Government introduced a new concept of "Climate Change Agreements" which are smartly connected to the Levy (see e.g. BMU 2004c, DEFRA 2004a).

Neither Italy nor Spain have introduced additional taxes on energy, fuels and electricity with a steering effect. Although Italy's taxes on energy lie above the European average, inscrutable regulations on exemptions significantly weaken the economic efficiency and ecological effectiveness of energy taxes. Generally, the taxes only have a fiscal motivation. In 1998, Italy had introduced an additional CO₂ tax, mostly for private users, but as soon as energy

⁶ In Germany, there is a general tax for electricity if electricity cannot be traced back to individual energy sources. Only electricity from renewable energies which comes from a grid that is exclusively based on renewables is exempted from the tax (see BMU 2004a, p. 13).

prices rose in 1999, a planned further increase in this CO₂ tax was abandoned (vgl. OECD 2001, p. 52). Spain has up until now avoided a CO₂ tax or additional energy tax because of fears that this could harm competitiveness (vgl. OECD 2004, p. 126). This has to be seen in the background of Spain's efforts to push economic growth in order to catch up with the "old" EU member states. Both countries therefore focus on the use of voluntary agreements which are – especially in the case of Italy – not clearly defined and seem to be updated and changed according to current needs.⁷ The Italian voluntary agreements can thus mostly be seen as a symbolic climate change policy, which hints towards a dragger behaviour.

The introduction of the European Emissions Trading System (EU-ETS), which started operating in January 2005, and the allocation of allowances within the systems also gives clear hints on pusher or dragger behaviour. As emissions trading systems are theoretically the best instrument for achieving a cost-efficient reduction in emissions (see Cansier 1996, pp. 214), policy makers and environmental NGOs hoped that Member States would allocate allowances accordingly. However, the final allocation of allowances within the EU ETS was disappointing in all member states (see e.g. Ecofys 2004). No country established a real tight allocation in its National Allocation Plan (the UK redrafted its first allocation and added 19,8 Mt CO₂ for the first EU-ETS period). This disappointing outcome is due to the threats coming from sectors of the energy and manufacturing industry, which argue with losses in terms of jobs and competitiveness (see e.g. UNICE 2004, p. 1; PointCarbon 2004b). This behaviour, which is typically explained by the New Political Economy theory, is especially disappointing from the UK, where a national emissions trading system had already been introduced in April 2002, so that the general attitude towards the instrument of emissions trading was supposed to be more positive.

3.2 Support of renewable energies/withdrawal from the carbon-based economy

GHG-emissions data show that the highest contribution to overall emissions comes from the energy sector. This is especially true if energy supply is based on coal and oil, which implies a high CO_2 -intensity in energy production. Therefore, the European Union decided that 12 % of energy shall be produced by renewable energy sources by 2010 (see European Commission 1997), and most Member States have their own goals for the use of renewables. Through the use of renewable energies like solar, wind, biomass and geothermal energy as well as combined heat and power, the CO_2 -intensity of given energy-

⁷ For example a voluntary agreement of chemical company Montidison was first thought to bring a emission reduction of 10 Mt CO2 but was soon reduced to a maximum reduction of 0,3 Mt CO2 (compare OECD 2002a, p. 207 and Minambiente 2002, p. 96).

consumption can be significantly reduced. In the face of rising oil prices, the use of renewables can also bring along economic advantages and secure an independent energy supply (independent from oil producing states). In line with the Porter-hypothesis, renewable energy technologies are also a contributing factor to the improvement of competitiveness. Technologies which are developed in Europe in order to meet the targets for renewable energies are already exported to other countries, especially to developing countries which see rising energy demand (especially China).

Nearly all European countries have introduced instruments to support the use of renewable energy or have directly subsidised the promotion of renewables. In line with the Porterhypothesis, the attitude towards renewable energies can be identified as a pusher element within climate policy in Germany, the UK as well as in Spain. Theses three countries have introduced instruments which significantly support the switch to renewable energies and contribute to the reduction of greenhouse gas emissions.

In Germany, the "Law on Renewable Energies" (Erneuerbare-Energien-Gesetz, EEG), which was introduced in 2000 and developed further in 2004, pushes towards a share of renewables in energy supply of 12,5% by 2010 and 20% by 2020. The EEG is similar to a subsidy to renewable energies, as German electricity companies are obliged to buy electricity from renewable energies at a fixed minimum rate.⁸ By 2010, 85 Mt CO₂ are supposed to be reduced through the EEG (vgl. BMU 2004b). In the UK, the "Renewables Obligation" makes sure that producers of electricity derive a given share of their energy from renewables (see Reiche/Bechberger 2004, p. 845). In Germany and the UK, the instruments promoting renewable energies are supported by taxes (ecological tax in Germany, Climate Change Levy in the UK) which give additional incentives for the use of renewable energies. The Spanish "Plan for the development of renewable energies" (Plan de Formento de las Energías Renovables) sets a target to achieve a 12% share of renewable energies by 2010. Similarly to the German EEG, the Spanish Plan implies a regulated feed-in tariff. By 2004, Spain has become the second biggest producer of wind energy in the EU (after Germany). Much more than the German and British instruments, the Spanish instrument is however primarily motivated by competitive thinking. The Spanish energy supply is supposed to become more independent from energy exports (vgl. Reiche/Bechberger 2004, p. 847).

⁸ The EEG is however not a "classical" subsidy, as it does not involve any public spending.

3.3 The use of the project-based mechanisms (JI and CDM)

Although the Kyoto-Protocol does not give an upper limit to the contribution of the projectbased mechanisms for meeting individual Kyoto-targets (which imply a less stringent reduction of GHG-emissions in the own country), the EU argues that a sustainable climate policy is possible only if at least 50% of reductions are achieved domestically (see European Commission 2003, p. 2 as well as Langrock et al. 2004, p.3 for a discussion on this issue). As the reduction of GHG-emissions through JI and CDM projects is supposed to be much cheaper than reducing emissions in the own country (see e.g. Lecocq 2004), countries which make an excessive use of these instruments gain an advantage compared to countries which try to achieve their Kyoto targets (mostly) domestically. Some countries, especially the UK and Germany, argue that the EU has to show that reductions of GHG emissions can be achieved in the own country without sacrificing economic growth and competitiveness in order to motivate other countries to ratify the Kyoto-Protocol. These two countries are involved in JI and CDM projects only in a limited scope.⁹

Both Italy and Spain plan to achieve a major part of necessary emission reductions through JI and CDM projects. The Italian government wants to reduce 11,4 Mt CO₂ equivalents per year through JI and CDM in the first commitment period, and therefore agreed with the World Bank to introduce the "Italian Carbon Fund", which is organised by the World Bank (see Minambiente 2004, p. 5; Lückge/Peterson 2004, p. 36). The Italian government is also involved in the "Community Development Carbon Fund" of the World Bank. The Spanish government assigns an even more important role to the project-based mechanisms. During the first commitment period, 20 Mt CO₂ equivalents per year are planned to be reduced through JI and CDM projects (see Ministerio de Medio Ambiente 2004, p. 24). This shall mostly be achieved through the "Spanish Carbon Fund". The Spanish government is however also trying to implement a Carbon Fund organised by the World Bank which is supposed to be similar to the Italian one (see Lückge/Peterson 2004, p. 19). As indicated, Germany and the UK do not give an important role to JI and CDM projects within their climate change polices. Both governments however implemented institutions to help domestic companies make use of JI and CDM. In Germany this is organised through the KFW Climate Fund (KFW-Klimafonds), and in the UK a Climate Change Office has been implemented.

⁹ This means that governments themselves are not involved in JI and CDM projects. It is still possible that companies make use of these mechanisms, especially over the EU Linking Directive. This directive allows companies which are covered by the EU ETS to achieve emission reductions through JI and CDM projects and then use the credits to fulfill their allowance under the EU ETS (see European Commission 2003).

According to the game theoretical approaches presented in Chapter 2, the behaviour shown by Italy and Spain could be identified as non-co-operative behaviour, as they try to minimize costs of meeting the Kyoto target by using JI and CDM while other countries make a major effort to achieve their targets mostly domestically. As there are no regulatory constraints on the use of the project-based mechanisms within the Kyoto-Protocol or on European level, this argumentation is however difficult to hold. The decision by Germany and the UK to make no major use of JI and CDM is only a voluntary commitment to strengthen the European leadership role within international climate policy negotiations. Facing the latest data on GHG emissions, and the fact that many EU-countries are far away from achieving their Kyoto commitments, it would be difficult to push towards a restricted use of JI and CDM, as this would mean that the fulfilment of the EU Kyoto target would become even more difficult.

3.4 Prevailing motives in the UK, Germany, Italy and Spain and the influence of external factors

The analysis of the three fields above shows that some behavioural motives seem to prevail in the different countries. An overview of the different fields is given in figure 3. This paragraph tries to bring the different fields together for each country. To prevent unfair judgements, external factors and special circumstances are taken into account.

Figure 3: Important fields of climate policy strategies and their use in Germany, the UK, Italy and Spain

	Germany	UK	Italy	Spain
Ecological/green tax or climate tax	✓ Since 1999	✓ Since 2001	Introduced: 1998, stopped: 1999	-
Voluntary agreements	✓ Since 1996	✓ Since 2001	√	~
Support of renewable energies	✓ Since 2000	✓ Since 2002	-	✓ Since 1999
National emissions trading system	-	✓ Since 2002	-	-
NAP in the frame of the EU-ETS		$\overline{\mathfrak{S}}$	8	☺?
Use of JI and CDM	minor	minor	high	high

Germany sees itself in a leadership role within European climate policy. With a reduction of GHG emission of about 19% from 1990 to 2003, Germany has reduced its emissions to a greater extent than any other EU country. The clear move towards a stronger use of economic instruments (especially the Ecological Tax Reform) underlines this assumption. The development in the field of renewable energy, with Germany having the greatest share in windenergy produced in Europe and a significant share of solar energy, shows the leadership behaviour in this field.

On the other hand, when taking a closer look at the design of policy instruments and regulations on exemptions, it becomes clear that German climate policy is not as consequent as it could be, and there is still a huge potential for greenhouse gas reductions. Within the market-based instruments, the Ecological tax reform as well as the allocation within the EU ETS, a strong role of industry is obvious. The German Industry Association (Bundesverband der Deutschen Industrie, BDI) especially has pushed towards exemptions for industry in the realm of those economic instruments in order to safeguard the competitiveness of its members. Additionally, the continued subsidies to the coal industry do not fit in with a leadership role. When assessing the achievements of the German climate policy and the significant reductions in the 1990s, one also has to consider that reductions were to a great part due to the restructuring of the Eastern German industry and energy supply after the reunification. These so-called "Wall fall" profits, which are similar to the "hot-air" phenomenon in Eastern European countries, are estimated to have brought along 50% of the reductions of GHG-emissions that were achieved up to the year 2000 (see Eichhammer et al. 2001, p. 10).

In the UK, the situation is similar. The British Prime Minister Tony Blair is highly involved and motivated in climate change policy, and currently fights for the reintegration of the US into the Kyoto-process (see Blair 2004; PointCarbon 2004a). The British climate change policy is based on a well designed policy-mix which makes sure that British climate policy is both ecologically effective and economically efficient. But as is the case in Germany, a strong role of industry can be seen, which pushed for a weaker design of economic instruments than originally proposed. This pressure from industry is however less influential than in Germany as the British climate change policy is based more on a bottom-up approach than in Germany. The government for example organised a stakeholder process when designing the Climate Change Strategy (see DETR 2000, p.28).

As the UK is also very active in respect to renewables, where it also strongly promotes new technologies (e.g. wave and tidal power) and does not plan to make major use of credits from JI and CDM, the leadership role seems to be consistent with British climate change Policy. The only point which does not at all fit into this image is the struggle over the allocation for the EU ETS which is going on between the British government and the

European Commission. To prevent drawing too positive an image of British climate change policy, it should be added that external circumstances were very much in favour of reducing GHG-emission in the UK. In the frame of the liberalisation of British Energy markets, there was a major switch to less CO₂-intensive energy sources. Known under the catch word "dash for gas", this mostly meant a change from oil and coal to gas (see Eichhammer et al 2001, p. 28).

Since the coming into power of the Berlusconi government, a negative attitude towards European climate change policy prevails in Italy. The Italian government decided to side with the Kyoto-opponents and, instead of a better cooperation with its European partners, has entered a bilateral climate alliance with the US (see U.S. Department of State 2004). On several occasions, Italy has tried to persuade other EU Member States to support this view, arguing that the EU should not tackle greenhouse gas reductions as long as other countries do not make any efforts. This argumentation can be explained by the dominant strategy of the prisoner's dilemma as it was explained in Chapter 2. These efforts towards undermining the European climate change policy was last seen on the session of European Environment Ministers in March 2005.

This dragger behaviour is intensified by the lacking efforts to reduce GHG-emissions in Italy. Nearly all climate policy instruments which were introduced up to now can be identified as merely symbolic policy, and there are no major efforts to implement economically effective and ecologically efficient climate policy instruments. Successes in some fields can only be seen as "windfall profits", which are mostly due to a restructuring of Italian industry as well as the liberalisation of Italian energy markets (see OECD 2002, p. 49). The planned extensive use of JI and CDM credits is a last try to fulfil the Kyoto-target or to show at least some effort towards formal compliance.

At first sight, the situation in Spain is similar. Since 1990, Spain has increased its GHGemissions by about 40%, which is much higher than its allowed increase of 15% under the EU Burden Sharing Agreement. Spain has been attacked from several sides, and was thought to compromise the positive image of the European climate policy (see Wandler 2004; World Wildlife Fund 2004). On the other side, the new government, which came into power in March 2004, promised to undertake major efforts in order to achieve Spain's Kyoto-target. The rise in GHG emissions, which the new government now hopes to stop, is due to the fact that economic growth was the absolute priority within the different policy fields. In line with the argumentation in Chapter 2.2, this does not mean that Spain necessarily has to be seen as a free-rider within European climate policy. The trade-off between climate change policy and other policy fields which were mostly pushing towards stronger economic growth was much stronger in Spain, being a cohesion country, than in one of the "old" Member States. Still, the dragger motives seem to prevail. Up to now, no major instruments have been introduced, and the only positive trends towards a reduction of GHG-emissions come from the regulations on renewable energies. With the introduction of the Spanish Carbon Fund and further plans in this field, the focus of Spanish climate policy now seems to rely on making use of the project-based mechanisms. If Spain wants to show that it is no free-rider but rather a "late-starter", it now has to become active and show a major effort in respect of an efficient and effective climate change policy.

4 Conclusion

As the European Union acted as a leader in climate change policy since the agreement in Kyoto was achieved in 1997, it now seems crucial for a further success of international climate policy that the EU fulfils its Kyoto target of the first commitment period. To be a positive example that motivates other countries to be involved in climate change policy as well, the EU has to show that climate policy is actually not a burden, as it is conceived by many countries and actors, but a benefit that can stimulate economic growth and modernisation. To make the ratification of the Kyoto-Protocol attractive to other countries, the EU has to show that it is possible to achieve a given emission target without sacrificing economic growth, jobs, and competitiveness.

Major efforts have to be taken so that possibly all EU countries meet their targets under the EU Burden Sharing Agreement. Chapter 3 showed that there is still a high potential for the improvement of climate policy, especially within countries where the dragger behaviour prevails. It was shown that theses countries have, up until now, hardly implemented any new instruments which give an incentive towards the improvement of energy efficiency and the reduction of GHG emissions. Based on the ideas of the Porter-Hypothesis, the positive effects of an effective climate change policy again have to be demonstrated to these countries. Most importantly, the cohesion countries like Spain have to become aware that climate change policy and economic growth are not two conflicting policy fields, but rather that they can actually go hand in hand. This could, for example, be achieved through the demonstration of case studies which present cases where regions or single companies profited from reducing their GHG emissions.

Some of the EU dragger countries (especially Italy) still use argumentation which is similar to the dominant strategy of the prisoner's dilemma ("why should we get active while other countries do nothing"). These countries seem, to some extent, reluctant to the fact that an effective climate change policy is profitable even if other countries at the moment decide to stick to the non-cooperative behaviour. Simulation studies, which are more and more used by policy makers to support their argumentation for the need to engage in climate policy, show that costs which come along with measures to prevent climate change are far outweighed by the prevented damages (see e.g. Kemfert 2005).

Although there are high expectations for dragger countries to reduce their GHG emissions, it should not be forgotten that countries which are mostly perceived as pushers also still have a high potential for GHG reductions. The circumstances in the UK and especially in Germany have been rather positive, and it appears as though both countries could reduce their GHG emissions significantly. However, emissions data show that, since the year 2000, GHG emissions were not much further reduced in both countries. In order to strengthen and justify the classification as "pusher-countries", the design of climate policy has to become more consequent in those countries. Taking into account the findings from the New Political Economy, distortions in the political process due to the power of industry lobby groups should be removed. Here again, it has to be shown that climate change policy can bring along benefits and that it is not a burden. It seems strange that some companies like BP make a profit through their climate change strategy while other companies from the same sector argue that they can not reduce their emissions without loosing jobs and competitiveness.¹⁰ Additionally, pusher-countries which see themselves as leaders in respect to renewable energies should act more consistently and stop further subsidies to coal industry.

To make sure that European Climate Policy becomes more successful in the future, regulations with loop-holes or which give wrong incentives should be redesigned. So, for example, the regulations under the EU Burden Sharing Agreement should become more strict. Up until now, a country that does not fulfil its individual reduction target under the Burden Sharing hardly faces any sanctions if the EU as a whole achieves its target. This gives a false incentive to speculate on this case which could be removed with the introduction of sanctions similar to those in other policy fields (for example the sanctions under the Stability and Growth Pact).

All in all, a convincing leadership initiative is only possible if a solution is shown to other countries, and if possible measures and instruments are demonstrated. In order to convince other countries to ratify the Kyoto-Protocol and to become more active in fighting against

¹⁰ Between 1998 and 2001, BP reduced its greenhouse gas emissions by nearly one fifth. The company achieved this through the integration of emissions caps into ist managers' performance targest and the development of an internal carbon trading system that focused on making the lowest cost reductions first. BP spent approximately \$20 milion to implement the reductions strategy, but in the process realised almost \$650 million in financial savings within just three years. Executives say they are confident that there is at least another \$650 million in value to be realised from the next step in reductions efforts (see The Climate Group [http://www.theclimategroup.org/index.php?pid=400]).

climate change, the findings from this study can be extrapolated to the international level. Other countries, especially developing countries, have to become aware that climate change policy is actually not a burden but can rather be a benefit.

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