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Abstract

The Kyoto Protocol allows international emissions trading, which could take place in three different forms: government, permit, or credit trading. Which trading system is chosen is likely to depend on the preferences of several interest groups. In this paper, we give empirical evidence on the preferences of industry and environmental organizations for national environmental policy instrument and for international emissions trading scheme. Furthermore, we present data that gives an indication about the level of rent-seeking by these groups at the international level. The aim of this paper is to identify which instruments are politically most feasible.

JEL Classification: D72, H41, Q25, Q28

Keywords: Emissions trading, CO_2, Kyoto, Public Choice

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1 Introduction

The Kyoto Protocol of 1996 allows emissions trading between the countries that have committed to an emission ceiling (the Annex B countries). However, the Kyoto Protocol does not specify how emissions trading should be conducted. Often interest groups have considerable influence on the implementation of policy. In many countries, governments negotiate both the level of abatement and the instrument to be used with industry. Other interest groups, such as environmental organizations, also exert influence on these decisions. In this paper we present empirical evidence concerning interest group preferences for national instrument and for the three possible international emissions trading schemes: government trading, permit trading and credit trading. From this evidence we try to infer which national instruments and which international trading schemes are politically feasible.

A first option is that governments trade among themselves. To be able to trade, governments will have to find a trading partner. Subsequently negotiations are initiated about the quantity and price of the permits to be traded. After the trade is concluded, the buying country can increase its emissions and the selling country must reduce its emissions by the amount of the trade.

Under a system of permit trading, the emission sources are regulated nationally through a system of tradable permits. These permits can then be made tradable internationally. Hence, emission sources in different countries will be able to trade directly with each other. It is important to note that it is a prerequisite for international permit trading that emission sources are faced by a tradable permit system domestically (see Ellerman (1998), Hahn and Stavins (1999), Zhang and Nentjes (1999) and Boom and Nentjes (2000)). It is likely that brokers will mediate in the market, as is already the case in the SO_x market in the US. When a large number of traders has entered the market, a perfectly competitive market will develop, with every firm buying and selling the quantity of permits it wants at the going rate.

Credit trading means that a firm that wants to sell emission rights has to plan an abatement project first. The project is then analyzed by a government agency, to assure that the emission reduction is genuine and durable. When the government agency has convinced itself of the genuinity and durability of the emission reduction, an emission credit is issued, which can be sold. This is in contrast with a tradable permit system, where permits can be sold prior to the planning of an abatement project. Credit trading therefore is a system that lies in between joint implementation (JI) and tradable permits. The advantages and disadvantages of the system will thereby also closely resemble them of JI. The main difference between JI and credit trad-

ing is that with JI, the finance and much of the technology and know-how is delivered by another firm than the firm at which the project is implemented. With credit trading the firm that implements the project finances and implements it itself without help from a possible buyer of the credits. Hence, with credit trading there is no need for contact between buyer and seller of the emission quotas prior to the trade (and even then it is not necessary) while this is essential in JI.

Several studies have analyzed the advantages and disadvantages of these three systems. Bohm (1999) gives an analysis of a government trading system and concludes that it can, under certain conditions, be rather efficient. Hahn and Stavins (1999) analyze which domestic environmental policy instruments are compatible with the different flexibility instruments under the Kyoto Protocol. They describe international emissions trading as permit trading. Their conclusion is that international emission trade between private entities is only viable when the trading firms are regulated through a national tradable permit system. Ellerman (1998) and Zhang and Nentjes (1999) arrive at the same conclusion. UNCTAD (1998) mentions both permit and government trading, but does not give an analysis of the two schemes, although it does give an analysis of previous experience with national tradable permit and credit schemes. Boom and Nentjes (2000) give an analysis of government trading and permit trading. They conclude that the choice between private trading and government trading is highly a choice between full efficiency but limited political control with the system and limited efficiency but full political discretion over the amount of trade and whom to trade with. Finally, Boom (2000) gives an analysis of credit trading. He finds that credit trading is less efficient than permit trading, but is more compatible with different domestic instruments than permit trading is. Furthermore, credit trading makes the trade in hot air impossible and will therefore lead to a lower emission level than permit trading.

The papers mentioned above hardly take the effect of interest group preferences into account. In general, literature on the preference of interest groups for environmental policy instrument is scarce. Buchanan and Tullock (1975) were the first to analyze the effect of interest group preferences on the choice of national instrument. They show that industry profits are higher with direct regulation than with a tax. Dewees (1983), expands on the analysis by Buchanan and Tullock. He finds that, depending on the circumstances, firms should prefer performance standards or grandfathered tradable permits. Workers will prefer performance standards and environmentalists will prefer market instruments. Leidy and Hoekman (1994) expanding upon Buchanan and Tullock's model in another way than Dewees, and find that industry, workers and environmentalists all prefer direct regulation. Dijkstra (1999)

gives the most thorough theoretical analysis of interest group preference for environmental policy instrument[1]. Dijkstra (1999) gives a preference ordering for shareholders, workers, environmentalists and environmental bureaucracy over emission ceilings, performance standards, grandfathered and auctioned tradable permits and emissions charges. Shareholders prefer grandfathered tradable permits with emission ceilings coming in second place. Workers prefer emission ceilings and environmentalists prefer auctioned tradable permits with emission ceilings taking second place. The environmental bureaucracy prefers emission ceilings with grandfathered tradable permits coming second.

Other forms of analysis are offered by Bohm and Russell (1985), Barde (1995), Svendsen (1998b) and especially Nentjes and Dijkstra (1994). These studies also show that industry prefers direct regulation or grandfathered tradable permits, while environmental organizations prefer tradable permit systems. Svendsen (1999) and Dijkstra (1999) also provide some empirical evidence that supports the theoretical studies. However, none of these studies provides insight in the preference of interest groups for international emissions trading regime. This is, in a theoretical study, given by Boom and Svendsen (2000). In this study, we derived several hypotheses concerning the ability of interest groups to organize at national and international level and about the preferences for international emissions trading regime.

A first result was that industry will be organized strongly at the national level. Only energy intensive sectors, would be present at international level, not industry in general. Environmental organizations were also organized at the national level but less strongly than industry because their members form a very large group consisting of many small consumers. In contrast to industry, environmental organizations are well organized at the international level and therefore they may have significant impact here in the absence of industry.

The analysis of the preferences for international emissions trading scheme of industry and environmental organizations led to the following hypotheses. We found that industry will prefer performance standards[2] (US industry may prefer grandfathered tradable permits), set through voluntary agreements, at the national level, while environmental organizations prefer tradable permits at this level. At the international level, industry prefers trading between private entities. However, their choice of performance standards at the national level makes it impossible for them to choose a permit trading system. For such a system, a tradable permit system at the national level is a prereq-

[1] See also Dijkstra (1999) and Heyes and Dijkstra (2000) for a review and discussion of the literature on this subject

[2] Performance standards are emission limits per unit of production. Hence, total pollution per firm is allowed to increase with production, i.e. there is no fixed ceiling.

uisite. Therefore, industry supports credit trading. Industry does however also want to retain the possibility of hot air trading. To accomplish that, they want to combine credit trading with government trading. Besides this, government trading also gives industry a possibility to increase their rent-seeking. For environmental organizations, the greatest concern is to reduce emissions as much as possible. Therefore, they prefer credit trading, which makes trading in hot air possible. However, since credit trading can be combined with government trading, environmental organizations will call for a limit on international trading, to prevent hot air from being traded.

As mentioned above, the preference for international emissions trading scheme depends on the preference for national environmental policy instrument. Therefore, we provide empirical evidence on both the preferences of industry and environmental organizations for national instrument and for international emissions trading scheme. In providing empirical evidence for the preferences for national instrument, we greatly expand the studies by Svendsen (1998b) and Dijkstra (1999) because we provide information on twelve countries, while Svendsen and Dijkstra only provide information on the US, Denmark and the Netherlands. The empirical evidence provided on the preference for international emissions trading scheme is entirely new.

Since there are no surveys available on the preference of interest groups of international trading regime, we chose to gather information on the Internet. Because interest groups are also interested in the support of the general public, we expect that they provide information on their opinions on this medium. In general this was right, although environmental organizations use the Internet more as a platform of distributing information than industry does.

Gathering information in this way may cause some problems. The organizations that present themselves on the internet may only be a selection of the total number of organizations involved. Although this may be right, it also is an advantage. Only organizations that have formed an opinion and want to influence policy makers and public opinion will be present on the internet. Other groups may be affected, but as long as they do not form an opinion themselves, they will not affect the decision making process and are thereby irrelevant to this study. Another problem that can arise is strategic behavior. It is not certain that interest groups always give their real opinion on some issues for some reasons. This problem is a real one, but is not confined to our method of gathering information. Such behavior can only be detected with certainty by leading members of the organizations. In the analysis below, we will mention when organizations may have strategic reasons for not displaying their true preferences or motivations.

The remaining part of the paper is organized as follows. Sections 2 and 3

look at empirical evidence concerning policy preferences for industry lobbies and environmental groups at the national and the international level. Section 4 treats rent-seeking at the international level. Here we look at the presence of interest groups in the political decision-making process as an indicator of their rent-seeking strength. Section 5 summarizes the results and proposes a policy recommendation concerning actual design of a future, global CO_2 market.

2 Industry

2.1 National Instrument

As already mentioned above, we expect that industry will prefer flexible forms of direct regulation, such as an emission standard per unit of product, or performance standards, at the national level. However, American industry may prefer tradable permits. These instruments are supported because they give firms an opportunity to increase emissions with production, while they in general lead to low abatement costs.

Global Organizations

We identified three global industrial organizations: The International Climate Change Partnership (ICCP), the World Business Council for Sustainable Development (WBCSD) and the World Coal Institute (WCI). All three favor voluntary agreements as national instrument although emissions trading is also supported (Fay (1999), ICCP (1998), WBCSD (1997, 1998) and WCI (1999)). The ICCP is however not completely convinced of usefulness of emissions trading because of the limited experience with the instrument (Fay (1999))

North America

The US has not yet ratified the Kyoto Protocol. This is reflected in the position of many US organizations. Generally, industrial organizations oppose the ratification of the Protocol. They argue that global warming is not a serious problem and that taking measures to reduce emissions of GHGs will be very costly to the US. Furthermore, climate change must be addressed comprehensively and by all states, which is not the case in the Kyoto Protocol (GCC (1999)). However, many organizations are aware that some measures will be taken to lower CO_2 emissions. Therefore, it was possible to find statements about preference for national instrument on the issue of reduction of GHGs. The American industrial organizations we found information on are the National Association of Manufacturers (NAM), the Global

Climate Coalition (GCC), the Edison Electric Institute (EEI), the Business Roundtable (BRT) and the Electric Power Supply Association (EPSA).

All these organizations but the EPSA state a clear preference for voluntary agreements as the national instrument (NAM (1999), GCC (1999, 2000), EEI (1998) and BRT (1997)). According to the (EEI), "the best way to address climate change should be voluntary, cost-effective and flexible" (EEI (1998)). Several reasons are given why industry should be involved in voluntary agreements (Kinsman et al. (1996)). Among these are that the government has pledged action to limit the emissions of GHGs and that doing nothing would "diminish electric utility influence on regulators, possibly subjecting companies to government control that tell them what strategies and technologies to use" (Kinsman et al. (1996)). Furthermore, cooperation with federal and state agencies is seen as necessary to ensure the opportunity to use market-based approaches (emissions trading) and to improve the possibility to influence government policy later on (see also EEI et al. (1998)). According to the BRT, only no-regrets options should be taken. Furthermore, policy should be flexible, with maximum emphasis on performance-based approaches rather than prescriptive measures (BRT (1997)). The NAM stresses that American industry already is putting much effort in increasing energy efficiency, and thereby in reducing emissions of CO_2 (NAM (1999)).

The EPSA does not state a direct preference for voluntary agreements. However, they "support the development of comparable air emission requirements"(EPSA (1998)), i.e. performance standards.

Support for a national permit trading scheme is rather low. Only BRT and EPSA state a support of tradable permits, while EEI's support is more ambiguous (BRT (1999), EPSA (1998)). The main reason for support of tradable permits is the cost reducing potential (BRT (1999)). However, the NAM does not support emissions trading at the national level because such a system would shoulder a disproportionately large share of the abatement burden on industry. Furthermore, such a scheme would disadvantage small manufacturers (NAM (1999)).

All Canadian industrial organizations also support voluntary agreements. The Canadian Pulp and Paper Association (CPPA) and the Canadian Electricity Association (CEA) support the Voluntary Challenge and Registry (VCR) Program, a voluntary program to reduce GHG emissions (Weyerhaeuser Jr. (1996), CEA (1999)). Besides voluntary approaches, the Alliance of Manufacturers & Exporters Canada (AMEC) also supports market based approaches but rejects emission charges (AMEC (1999))

Japan

In Japan voluntary agreements are also the preferred instrument of indus-

try. Keidanren, the Japan Federation of Economic Organizations, states that voluntary actions "can achieve results more effectively than unilateral regulations" (Toyoda et al. (1997)). The Federation of Electric Power Companies of Japan (FEPC) proposes to use flexible instruments such as "voluntary agreements and those introduced by the Kyoto Protocol" (EEI et al. (1998)).

Both Keidanren and the FEPC are opposed to taxes with Keidanren questioning the efficiency and effectiveness of this instrument (Henkel and Toyoda (1996)). The FEPC furthermore mentions subsidies and excessive regulation as unwanted instruments.

Europe

Within Europe, many organizations guard the interests of business at the EU level. We found information on the European Chemical Industry Council (CEFIC), UNIPEDE and EURELECTRIC, which both represent the power generation sector, the International Federation of Industrial Energy Consumers (IFIEC), UNICE, the European Round Table of Industrialists (ERT) and the European Business Council for a Sustainable Energy Future (e^5).

All of these but e^5 prefer voluntary agreements at the national level (CEFIC (1998a), EEI et al. (1998, 1999a) , UNIPEDE/EURELECTRIC (1999a, 1999c), IFIEC (1998), UNICE (1998a, 1998b) and ERT (1997)). Several reasons are given for this preference. They provide industry with the necessary flexibility to achieve pre-set goals and they are conductive to innovation (CEFIC (1998a)). Another reason is that they improve "the dialogue between those who set environmental objectives and the economic actors" (UNIPEDE and EURELECTRIC (1999c)).

The most ardent supporter of tradable permits is e^5. Many other organizations give some support to tradable permits (see UNIPEDE and EURELECTRIC (1999b), but often only when voluntary agreements with performance standards (efficiency improvement) constitute the relevant basis for setting up trading schemes (CEFIC (1998b), IFIEC (1998) and UNICE (1998a, 1998b)). Reasons to support tradable permit systems are that they make it easier and economically viable to use technologies that reduce greenhouse gases (ERT (1997)), that they lead to fewer market distortions than the commonly used command and control instruments and because "Such instruments make sustainable energy more competitive and will move the innovation process in an optimal direction" (e^5 (1998)).

Taxes are seen as depriving industry of the funds needed to invest in abatement technologies (CEFIC (1997, 1998b)), while the imposition of absolute greenhouse gas reduction targets is described as being "tantamount to rationing use of fossil fuels and would thereby entail unacceptable limitations on production" (CEFIC (1998a)). Furthermore, absolute emission

caps "could severely threaten industrial competitiveness, employment and growth" (IFIEC (1998)).

Of the national European industrial organizations, the Dutch employers organization, VNO-NWO, all German organizations we found information on, and the Belgian employer organization, VBO-FEB, prefer voluntary agreements (VNO-NCW (1999), Meller and Hildebrand (1998), BDI et al. (1998) and VBO-FEB (1998)).

One reason given for this support is that voluntary agreements gives companies a free choice in how to reduce emissions (Meller and Hildebrand (1998)). Besides this, it is argued that voluntary agreements are much more effective than taxes and charges (Meller and Hildebrand (1998)). In the Netherlands, a voluntary agreement to reduce CO_2 emissions is already signed between Dutch industry and the government (VNO-NCW (1999)). In the agreement, industry commits itself to improve energy efficiency by benchmarking.

European industry lobbies heavily against the imposition of taxes on GHG emissions. One argument against taxes is that they bind capital in an unproductive way and thereby deny firms the means needed to utilize energy efficient technologies (Meller and Hildebrand (1998) and VBO-FEB (1998)). Furthermore, they increase the already high European energy costs (VBO-FEB (1998))

The above shows that there is large support for voluntary agreements in Europe. However, there is also support for tradable permits. The support comes from the Confederation of British Industry (CBI), Næringslivets Hovedorganisasjon (NHO), the main organization of Norwegian business, and Dansk Industri (DI), the organization of Danish industry.

CBI believes that permit and credit trading has significant potential as a cost-effective way to reduce greenhouse gases. (CBI) has, together with the British government, designed an industry-wide scheme for emissions trading (CBI (1999a, 1999b)). CBI states that "The aim of the emissions trading project is to design a scheme for emissions trading in the UK which could then link into a future international emissions trading scheme" (CBI (1999a)). Furthermore, it is hoped that the scheme will keep the UK in the "vanguard of international emissions trading and in a good position to get involved in any future schemes" (CBI(1999b)).

According to NHO environmental costs should be reflected in the price of energy, which they think tradable permits will be better at doing than taxes (NHO (1998, 1999)).

Oceania

We found information on two organizations from Australia; The Pulp and

Paper Manufacturers Federation of Australia (PPMFA) and the Electricity Suppliers Association of Australia, and one from New Zealand; The New Zealand Business Roundtable (NZBR). All these express a preference for market based instruments at the national level ((NZBR (1996, 1999)), PPMFA (1998), Cribb (1998), and ESAA (1998)). The New Zealand Business Roundtable (NZBR) states that both taxes and tradable permits will obtain cost efficiency. No preference for one of these two is stated however (NZBR (1996, 1999)). In Australia, emissions trading is the preferred instrument (ESAA (1998) and Cribb (1998)).

The main result from this section is that most industrial groups prefer voluntary agreements at the national level. Industry sees this instrument as cost-effective, flexible and environmentally effective. Furthermore, voluntary agreements make it possible to influence the regulator. Generally, there is large resistance against emission taxes. Industry argues that taxes deprive them of the funds needed to invest in abatement capital. Emission ceilings are also rejected because they ration fossil fuel use and limit production.

Some industrial organizations support permit or credit trading. Only in the UK, Norway, Denmark and Australia, there is clear support for permit trading at the national level as the only instrument. In other countries, tradable permits or credits are at most seen as additional to voluntary agreements. Arguments used in favor of emissions trading are that the instrument is cost-effective, does not give market distortions and spurs innovation. Furthermore, it is though that a national emissions trading scheme will give a good position when international trading is allowed. As a disadvantage is given that there still is little experience with the instrument.

In general, the hypothesis derived by Boom and Svendsen (2000) is supported by the survey; industry prefers performance standards or voluntary agreements. The latter ones normally define some performance standard to which industry commits itself. There are however some findings that do not confirm the theory as developed by Boom and Svendsen (2000). First, the preference for tradable permits by the UK, Norway, Denmark, Australia and partly New Zealand needs to be explained. In Denmark, an intricate CO_x tax system is currently in use (see Svendsen (1998a)). Taxes are normally seen as one of the worst instruments by industry. Therefore, it appears that Danish industry has not been able to convince the Danish government of the usefulness of performance standards. Hence, the choice is limited to market instruments. Of these, tradable permits are preferred by industry to taxes.

For the remaining countries the explanation may be that they stand to gain much from emissions trading. Norway will have high costs of greenhouse gas (GHG) emission reduction because of its reliance on hydraulic power and

will probably rely to a large extend on emission quotas bought abroad for its compliance with the Kyoto Protocol. The UK, Australia and New Zealand on the other hand have negotiated rather high emission ceilings. The UK even received hot air (see Ringius (1999)). These countries are potential sellers of emission quotas. Having a national tradable permit system makes it easier to join international emissions trading. Specifically, transaction costs will be low and the preparation time for trading will be relatively short, compared to a credit trading system.

Other reasons for choosing tradable permits are that they create a barrier to entry and that the efficiency advantages of tradable permits are bigger than the disadvantages of the fixed ceiling. Furthermore, bad previous experience with other instruments may convince some industrial organizations of the usefulness of tradable permits. A last reason could be that the industrial organizations do not fully understand the workings of a tradable permit system.

Although in line with the theory as developed by Boom and Svendsen (2000), the lack of support for tradable permits in the US is surprising. Svendsen (1998b) showed that American industry in general favors tradable permits over all other instruments. The US is also the only country with substantial experience with tradable permits, especially in the SO_x trading system. So far, evaluations give a rather positive view of this system (see Klaassen and Nentjes (1997) and Schmalensee et al. (1998)).

Since the US has not ratified the Kyoto Protocol yet and may very well never do so, industry has an incentive not to show a high willingness to abate and certainly has no incentive to take on a fixed ceiling for emissions. Therefore, it is not very willing to discuss measures or instruments yet. Furthermore, the problem of reducing GHG emissions is by US industry also seen as being of an entirely different order than the reduction of SO_x emissions. Both the GCC and the BRT note that, in contrast to SO_x, GHGs have a variety of sources and that there are no economic viable technologies for removing CO_2 (BRT (1999) and GCC (1999)).

2.2 International Trading Scheme

Our hypothesis (Boom and Svendsen (2000)) is that at the international level, industry will prefer a combination of government trading and a system of trade between private entities. For European industry, the latter would be a credit trading system, while for American industry it would be a permit trading system. The reason that industry supports government trading is twofold. Firstly, it gives them the possibility to shift the burden of abatement

to other sectors to a greater extend. Secondly, it gives the opportunity to purchase hot air. Another result found in the theoretical analysis is that industry is expected to be better organized at the national level than at the international level (see also Section 4). The main reason for supporting private trading is that it is more efficient than government trading.

Global Organizations

The global industrial organizations we found information on all support international emissions trading (ICCP (1999), (WBCSD (1999) and WCI (1999)). Furthermore, they all favor trading at the private level. The WBCSD states that "governments should foster *a market in which companies can participate directly* in international emissions trading and can trade credits obtained from projects" (WBCSD (1998)). This statement reflects both that the WBCSD realizes that governments will trade and that they prefer permit and credit trading at the private level. All global organizations reject quantitative caps on emissions trading (ICCP (1999), (WBCSD (1999) and WCI (1999)). The WBCSD writes "Attempts to elaborate supplementarity through national ceilings on trading will increase complexity and cost. It may also erode confidence in a traded commodity relying on parties' commitment to the targets that they have negotiated" (WBCSD (1998)).

North America

The evidence from the US is rather mixed. Some organizations have doubts about the usefulness of international emissions trading (see AMEC (1999), BRT (1999) and EEI (1998)). According to the EEI, "until provisions governing emissions trading, joint implementation and CDM are fully fleshed out, the value of these mechanisms cannot be determined" (EEI (1998)). Other organizationas are outright opposed to the idea of international emissions trading. The NAM states that "International emissions trading would require U.S. companies to buy 'credits' from Russia or ex-Soviet bloc economies, . . . , which are really economic-growth rights, at near-monopolistic prices. This private foreign aid will be a huge additional energy tax on American business" (NAM (1999)).

However, there is some support for international emissions trading (BRT (1997), BRT (1999), CEA (1999b), and EEI et al. (1999)). The main reason for support is the cost reducing potential. According to the BRT, international emissions trading can "result in sharply reduced compliance costs, reducing the impact of limiting the levels of these (GHG) emissions" (BRT (1999)). Furthermore, it does not give market distortions (EEI et al. (1999)).

US organizations all reject limits on emissions trading. According to the GCC "We must do everything we can to minimize the damage to the

economy. For that reason, any emissions trading has to be unlimited" (GCC (1999)). The EEI is very categorical in its rejection "there must be no quantitative or qualitative caps or limits, individually or collectively, on the use of the market mechanisms" (EEI et al. (1999))

Most organizations prefer trading at the private level (EEI et al. (1998, 1999)) and BRT (1999)). However, none of them states a clear preference for credit trading or permit trading.

Japan

Both Keidanren and FEPC support international emissions trading. In the words of Keidanren, "the idea of JI and the emissions trading scheme among governments and so on deserve consideration as approaches that provide flexibility" (Keidanren (1997)). Here government trading is mentioned explicitly. The FEPC mentions it implicitly by saying that voluntary participation by private sector entities must be included in international emissions trading (EEI et al. (1999)). Hence, there is an expectation that governments will trade, but there is also a wish for private entities to join trading. Only the FEPC states that it wants no caps on emissions trading (EEI et al. (1999)).

Europe

All pan-European organizations support international emissions trading. Moreover, most prefer trading at the private level (see CEFIC (1998), e^5 (1998), EEI et al. (1998, 1999), ERT (1997), IFIEC (International Federation of Industrial Energy Consumers (IFIEC) 1998), UNICE (1998), UNIPEDE and EURELECTRIC (1999b). The most stated reason for support of private trading is that it lowers costs of compliance. As stated by UNIPEDE and EURELECTRIC "free and open trading can help to meet emission objectives by lowering compliance costs and by giving a strong signal, via the price of CO_2 permits, on the economic implications of an emission objective" (UNIPEDE and EURELECTRIC (1999b)). The IFIEC states that "the trading system would operate at company level as only companies can deliver the agreed efficiency improvements" (IFIEC (International Federation of Industrial Energy Consumers (IFIEC) 1998)). Only the IFIEC gives a clear preference for credit trading (IFIEC (International Federation of Industrial Energy Consumers (IFIEC) 1998)), while the others do not mention these two systems.

Most organizations show resistance against limits on international emissions trading (EEI et al. (1999), UNICE (1998), UNIPEDE and EURELECTRIC (1999b)). Reasons for this are "it would be environmentally and economically counterproductive to seek to put arbitrary limits on the use of flexibility and trading" (UNICE (1998))

Most national European industrial organizations also support international emissions trading (CBI (1999b), DI (2000a), NHO (1999), VBO-FEB (1998), Klemmer (1999)). Of these, many prefer trading at the private level (see CBI (1999b), NHO (1999), Klemmer (1999)). The main reason for supporting international emissions trading is that it offers a substantial potential for reducing abatement costs (VBO-FEB (1998))

The Dutch organization of employers, VNO-NCW, mentions that the burden of financing joint implementation or emissions trading by the Dutch government will not be shifted to firms that cooperate through voluntary agreements on the reduction of greenhouse gases. Although this does not show a preference for international emissions trading scheme, it shows an expectancy that such trade will be between governments.

The Swedish industrial organization Industriförbundet is against restricting trade. Its main argument is that restrictions on trade may cause that certain countries, notably the US, will not ratify the agreement. If that happens, this would mean a setback for improving environmental quality. Furthermore, it would lead to very different ambitions in national policies with regards to global warming (Industriforbundet (1999)).

Oceania

The PPMFA supports international emissions trading "in principle" (Cribb (1998)). Whether this should be government or private trading is not very clear. However, the PPMFA states that "for international emissions trading to work as an efficient market mechanism, it is essential that there are a large number of potential buyers and sellers". Furthermore, they argue that one of the factors that would contribute to the usefulness of a national trading scheme is an international trading scheme (PPMFA (1998)). Hence, the PPMFA seems to support private trading.

In general industrial organizations support international emissions trading. There is however some doubt, especially in the US, about the value of the instrument. Support to the instrument is mainly given because of its potential to lower costs of abatement.

The fact that many US organizations are skeptical about emissions trading may again be caused by the fact that the US has not ratified the Kyoto Protocol and that it is very uncertain that it will do so in the future. Because of this, industry is not willing to show a positive attitude to international emissions trading. Another reason for the skepticism is that the rules for international emissions trading have not been specified yet and hence it is not clear how such trade is to take place and what the potential gains from it will be.

Table 1: Industry Preferences*

Organization	**Location**	**National instrument**	**International trading**	**Restrictions on trade**
ICCA	Global	VA	–	–
ICCP	Global	VA/permits	private	no
WBCSD	Global	VA/permits	private	no
WCI	Global	VA/permits	private	no
BRT	USA	VA/permits	private	–
EEI	USA	VA	credit	no
EPSA	USA	standards	–	–
GCC	USA	VA	–	no
NAM	USA	VA	–	–
AMEC	CAN	VA/permits	–	–
CEA	CAN	VA	–	–
CPPA	CAN	VA	–	–
FEPC	J	VA	credit	no
Keidanren	J	VA	government	–
CEFIC	Europe	VA/credits	credit	–
e^5	Europe	permits	permits	–
ERT	Europe	VA/permits	private	–
Eurelectric	Europe	VA	credits	no
IFIEC	Europe	VA	credits	no
UNICE	Europe	VA/credits	gov./private	no
UNIPEDE	Europe	VA	credit	no
VNO-NCW	NL	VA	government	–
VBO-FEB	B	VA	credits	–
BDI	D	VA	–	–
VDEW	D	VA	credits	no
CBI	UK	permits	permits	–
NHO	N	permits	permits	–
DI	DK	permits	private	–
Industriförbundet	S	–	government	no
NZBR	NZ	permits/taxes	–	–
ESAA	AU	permits	–	–
PPMFA	AU	permits	private	–

* A – indicates that preferences on this issue where not found

Most industrial organizations prefer trading at company level. The main reason is that trading by private entities will give a more efficient market. However, only rarely a choice is made between permit trading and credit trading and equally seldomly the two systems are mentioned or discussed. Recall that a prerequisite for international permit trading is a national tradable permit system, while credit trading can be combined with any national instrument[3]. Since most industrial organizations prefer voluntary agreements at the national level, permit trading is not an option anymore and the only private trading scheme they can choose is credit trading. The industrial organizations do however not seem to realize this consequence of their previous choice of national instrument. A major reason for this may be that they are not aware that there are two systems to choose from, or they may not be aware of the differences between the systems. However, the combination of voluntary agreements containing performance standards and credit trading is very advantageous for industry. The performance standards provide soft targets without a ceiling on firm nor total emissions, while differences in abatement costs between firms can be equalized through credit trading.

Boom and Svendsen (2000) found that industry not only support credit trading, but will prefer a combination of credit trading and government trading. However, no industrial organization mentioned above states a clear preference for government trading or for a combination of credit trading and government trading. Judging from the material found from industrial organizations though, there is an expectation that governments will trade. This expectation is most clear in statements that ask for international emissions trading to be allowed for private entities too. Hence, other than private entities are expected to trade, which can only be governments. Industry may not mention government trading, because they find it obvious that governments will trade and they lobby to make private trading possible too. Furthermore, they support government trading to make trade in hot air possible. Since this might be seen as directly environmentally unfriendly, they do not want to state this very directly.

All organizations that mention limits on trading, mostly referred to as trading caps, reject the idea. The main reason for this is that limits on trade are seen as increasing costs of abatement. It is also mentioned that limits reduce environmental effectiveness. The Swedish industrial organization Industriforbundet is afraid that limiting trade will jeopardize ratification of the Kyoto Protocol by some countries, especially the US.

In Table 1 an overview of the preferences of industrial organizations is given.

[3]Credit trading can of course also be used nationally

Here, for all organizations that prefer voluntary agreements or performance standards at the national level and private trading at the international level, we assumed that they prefer credit trading at the international level. The empirical findings in this section support the theory as developed by Boom and Svendsen (2000) rather well. The choice of voluntary agreements and credit trading was predicted by the theory, as was the rejection of limits on trading. The only hypothesis derived from the theory that was not totally confirmed was a support for government trading besides credit trading. However, there is an expectation by industrial organizations that governments will trade emission quotas.

3 Environmental organizations

3.1 National Instrument

Nentjes and Dijkstra (1994) and Boom and Svendsen (2000) have shown that environmental organizations should prefer emission ceilings or tradable permits at the national level since these give the highest certainty of realizing the abatement goal set.

However, no clear preference for national instrument is shown in the statements found on the Internet. The Natural Resources Defense Council (NRDC) states that "tax incentives must be created in order to promote mass transit and encourage industries that develop efficient technologies and renewable energy sources" and "the US must institute mandatory limits on global warming pollution, using standards that optimize environmental performance, such as limiting the pounds of carbon emissions per unit of electricity output" (Lynch (1998)). Tradable permits on the other hand are dismissed as a too simple instrument by the NRDC: "Advocates of emissions trading think that you sit down at the piano and you play one emissions-trading key, and the sonata will play itself. We need to press keys for energy efficiency, and we need play renewable energy keys. We need to press this series of keys to make houses, buildings, industry, and vehicles more efficient" (Lynch (1998)). Clearly, the NRDC is of the opinion that many instruments have to be used to steer development in the right direction.

The Climate Action Network (CAN) does not discuss national instruments but gives many examples of technologies that can be used to reduce emissions (CAN (1998)). Lynch (1998) of the NRDC also gives such an overview. The World Wildlife Fund (WWF) does not just give an overview of technologies but has presented detailed studies for the US, Europe and Japan on how each can reduce emissions (WWF (1997a, 1997b, 1997c)).

In the same studies, WWF shows which instruments should be used. In all cases, a mixture of instruments is proposed. For the US, WWF proposes an allowance trading system for renewables and a pollutant trading system. Besides these, tax credits and direct regulation is called for (WWF (1997). On the other hand, for the EU, voluntary agreements, efficiency standards and tax credits are proposed (WWF (1997b)). The report on Japan does not consider which instruments should be used but is entirely devoted to technology (WWF (1997a)). It seems that WWF proposes instruments in accordance with the traditions of the different regions instead of giving a preference for an instrument. Perhaps the WWF hopes that by clinging to traditions, the measures become more acceptable.

The Sierra Club Canada also comes with a detailed plan for reducing CO_2 emissions, although only for Canada (Comeau (1998). The plan contains many measures for almost all sectors of the Canadian economy. This includes efficiency standards, benchmarking and tax incentives for industry and a tradable permit system for both industry and power generation.

By proposing the use of a multitude of instruments, the positions of the WWF and the Sierra Club Canada resemble that of the NRDC closely. All think that many instruments should be used to obtain the wanted result.

The only environmental organization which is very clear about their preference of national instrument is the Environmental Defense Fund (EDF). The EDF prefers a system of tradable permits (EDF (1993, 1998)). The EDF concludes that "Mandatory, permanent emissions caps are imperative, but they will be effective only if they are practical, enforceable, and equitable. To achieve this, EDF has suggested a system based on tradeable emissions allowances" (EDF (1993)). However, the EDF has also supported voluntary agreements (EDF (1998, 1999)), but has always pressed for these to be credited, i.e. firms that reduce emissions should receive credits which in turn can be traded.

We found no statements on the Internet from Greenpeace discussing the implementation of GHG reduction policy at the national level.

As is clear from the above, no strong preference for national instrument is given by environmental organizations. Only two organizations stated a clear preference for one instrument. Three other organizations mention an array of instruments. Several explanations are possible for the lack of preference for a national instrument. One of the organizations mentioned above, CAN, is a union of national environmental organizations, founded especially for international cooperation on the problem of climate change. It is very well possible that it leaves the question of domestic implementation of the Kyoto Protocol to the single members. This may, in lesser degree also be true for

the other international environmental organizations reviewed above. As the comment by the NRDC made clear, some organizations want to achieve more goals than only a reduction of GHG emissions, for example an increased use of renewable energy sources. In general, it seems as if environmental organizations are rather uninterested in the question of national instrument. They are more concerned with the level of emission reduction set than with the way in which the level is realized. The reason for this is probably that environmental organizations so far have focused on showing that greenhouse gas reductions are feasible. Therefore, they have concentrated on technical measures and have not paid much attention to institutional factors such as environmental policy instruments.

3.2 International Trading Scheme

Boom and Svendsen (2000) found that environmental organizations will prefer a system of credit trading at the international level since this will ban trade in hot air. However, credit trading can be combined with government trading, thereby giving an opportunity to trade in hot air anyway. Therefore, it is expected that environmental organizations will call for a cap on trading to limit trade in hot air.

The WWF does not give a preference for international trading system. It discusses rules for government trading as well as private trading (WWF (1999)). However, in general, the WWF is skeptical with regard to international emissions trading. Already before the negotiations in Kyoto the WWF stated that the Kyoto Protocol should "not include an emissions trading system unless much stronger reduction targets than those currently proposed by industrialized countries are adopted" (WWF (1997)). The problem of hot air was also foreseen by WWF at this stage and the WWF urged that hot air should not be given to any country (WWF (1997)). After emissions trading was included in the Kyoto Protocol, WWF urged for limits on trading. The reason for this is that "placing a limit, or 'cap', on the proportion of Parties' Kyoto targets that can be achieved abroad will promote new technologies for domestic reductions and minimize trading in hot air" (WWF (1999)). The WWF still rejects international emissions trading in principle because "emissions trading is unfair because it rewards large industrialized polluters without compensating poorer nations which will suffer the worst effects of climate change" (WWF (1998)).

In an evaluation of the Kyoto Protocol in 1998, the Sierra Club of Canada only discusses emissions trading as a transfer of quotas between countries (Rolfe (1998)). It does however not express a preference for government trading over private trading. The Sierra Club sees the possibility of hot air

trading as the biggest problem with international emissions trading (Corbett et al. (1997) and Rolfe (1998)). To remove the problem of hot air, the Sierra Club proposes to use Article 6 of the Kyoto Protocol. In that case, emissions trading has to be based on abatement projects, ensuring that al permits traded are based on genuine emissions reductions. Hence, the Sierra Club prefers credit trading. In a report of the Sierra Club delegation to the negotiations in Kyoto, they also mention that a limit on trading is needed to spur emission reductions in the industrial countries (Corbett et al. (1997)), however, in later publications this is not mentioned again.

In its list of principles, rules and guidelines for flexibility mechanisms, the Climate Action Network (CAN (1999)) first only mentions parties, indicating government trading. However, later on they state that "Any private entity trading must be guided by agreed international rules and standards". Hence, private trading is also seen as an option, and no preference between the two is stated. In general, the flexibility mechanisms in the Kyoto Protocol are seen as loopholes that enable industrialized countries to "avoid taking domestic action ... and continue on a path of dangerous emissions. This is not only iniquitous but it is also ecologically ineffective" (CAN (1999)). Therefore, the flexibility instruments are only acceptable to CAN if they, besides being economically efficient, also benefit the environment. Therefore, trading in hot air should not be possible. Furthermore, trading should be supplemental to domestic actions. To achieve this, a quantitative cap should be placed on the use of the flexibility mechanism (CAN (1999, 1998)).

Friends of the Earth also qualifies emissions trading as a loophole (FOE (1998)). FOE does not discuss whether emissions trading should be between governments or private entities. It does however want to limit trade. According to FOE, "the majority of emissions reductions must be achieved through domestic, verifiable emission reductions" (FOE (1998)). The reason for this is that "it is essential to provide a clear signal to begin with redirecting investments to environmentally sustainable technology" (FOE (1998)). To ensure supplementarity, FOE proposes a cap on emissions trading of 20% of a Parties' target for the first commitment period. This would also restrict trading in hot air.

Greenpeace does agree that, at least in theory, emissions trading is cost-effective, without harming the environment (Greenpeace (1998a)). However, it does see "many ways in which a global emissions trading regime could go badly wrong" (Greenpeace (1998a)). One of the problems is hot air, which is mentioned as a major loophole. Furthermore, Greenpeace is of the opinion that domestic action must be the priority. To remedy hot air and to achieve that most abatement is realized domestically, Greenpeace proposes to limit emissions trading. More specifically, it proposes a 3% limit on the sale or

transfer of assigned amounts (Greenpeace (1998a, 1998b)). According to Greenpeace, this would limit the hot air problem to less than 1% of the 1990 Annex B emissions in the first commitment period. Besides a limit on the sale of assigned amounts, Greenpeace proposes a limit of 10% on the purchase of assigned amounts, which would ensure that domestic action has the major priority (Greenpeace (1998a, 1998b)). Like most other environmental organizations, Greenpeace does not discuss whether governments or private entities should trade.

The NRDC does not discuss whether international emissions trading should take place between governments or private entities. Furthermore, the problem of hot air is not mentioned either.

Opposite to all other environmental organizations, the EDF strongly supports the flexibility mechanisms of the Kyoto Protocol. Already in 1993, it stressed the cost-effectiveness of an international emissions trading system (EDF (1993)). The EDF does not make a direct choice between government and private trading, although it does mention that the incentives for firms to reduce emissions would be larger under private trading than under government trading.

While all other environmental organizations call for a limit on emissions trading, the EDF rejects the idea on four grounds (EDF (1998)). First, "no one path leading to emissions reductions is superior to, or more valid than, any other provided that actual reductions in emissions occur" (EDF (1998, p. 63)). That is, since greenhouse gases mix completely in the atmosphere, a reduction is a reduction no matter where it occurs. Hence, the distinction between domestic and foreign emission reductions is artificial. Second, a cap on trading would be arbitrary, increase compliance and transactions costs and would not bring any additional environmental benefit. Not only will it not be possible to trade 'cheap' emission reductions, to administer such a cap complex trade rules will be necessary. These will increase transaction costs for all trades. Third, a cap on trading would "constrain the continuous, open-ended search for the most cost-effective emissions reductions" (EDF (1998, p. 64)). Furthermore, a cap is thought to inflate compliance costs and thus slow the pace and penetration of innovation. The reason for this is, according to the EDF, that a cap on trading drives up the costs of innovation and thereby discourages the development and deployment of new technologies. The fourth reason is that caps on trading are superfluous because a sizable part of emission reductions will be realized domestically anyway. Transaction costs and efficiency and environmental gains will induce investments in domestic abatement.

In general, environmental organizations do not distinguish between inter-

Table 2: Environmental Organizations' Preferences*

Organization	**Location**	**National instrument**	**International instrument**	**Restrictions on trade**
Greenpeace	Global	–	–	yes
CAN	Global	–	–	yes
WWF	Global	–	–	yes
FOE	Global	–	–	yes
EDF	USA	permits	permits	no
NRDC	USA	standards	–	–
Sierra Club	USA/CAN	–	credits	yes

* A – indicates that preferences on this issue where not found

national emissions trading between governments and between private entities. Only the EDF shows a preference for trading between private entities because this is more cost-effective. Whereas environmental organizations are silent on preference for international trading scheme, they are very outspoken, and almost united, on the issue whether trading should be limited. All but one organizations want trading to be limited to some degree. The main reasons for this are that they want to ban trading in hot air, and want to ensure that the main part of emission reductions is achieved through domestic measures. Domestic measures are preferred over trading because, according to environmental organizations, domestic measures spur technological innovation. This in turn is needed in subsequent commitment periods because the current commitments are seen as insufficient to curb global warming.

We can conclude this section by stating that the empirical evidence on environmental organizations only partly supports the theory as described by Boom and Svendsen (2000). The positions of environmental organizations are summarized in Table 2. Environmental organizations do neither give a clear preference for national instrument, nor for international emissions trading scheme. However, they do clearly prefer a limit on trading, which is in line with the theory as developed by Boom and Svendsen (2000), both to limit trade in hot air and to ensure that trading is at most supplemental to domestic measures. The absence of a preference for both national instrument and international trading scheme makes that environmental organizations have no influence on the choice of these by governments. Hence, the preference of industry is not opposed and will therefore be dominant.

4 Rent-Seeking at the International Level

It is hard to determine how much rent-seeking takes place, both at the national level and at the international level. Rent-seeking takes place continuously, and neither the rent-seekers nor the target of the rent-seekers are eager to disclose how much effort is used in lobbying.

We have, however, found a method that, at least at the international level, may give some insight in the amount of lobbying from the different interest groups. At all Conferences of the Parties (CoPs), non-governmental organizations (NGOs) have to be accredited. Moreover, a list of all members of NGOs that where accredited at the different CoPs is given by the UNFCCC (see UNFCCC (1997, 1998, 1999)).

In the list of observers from Kyoto (CoP3) members of the UN, intergovernmental organizations and non-governmental organizations are included. For the conferences in Buenos Aires (CoP4) and Bonn (Cop5), it was possible to distinguish between members of the UN, special agencies, intergovernmental organizations and non-governmental organizations. Here we only took members of NGOs into account.

To differentiate between lobbyism at the national and international level we have made some amendments to the list of observers. Table 3[4] gives the number of observers from organizations that are located outside the organizing country or region. Hence, for Kyoto, members of Japanese organizations are not included, for Buenos Aires and Bonn, members of South American and German organizations are not included respectively.

The classification of observers has been as follows. The categories Industry, Environmental Organizations and Workers unions are rather obvious. The group 'Other Energy' contains representatives of suppliers of non-fossil fuels, such as renewables and nuclear energy. Neutral covers participants from organizations that can not be seen as interest groups, mainly research institutes. All observers that could not be placed in other groups, or of which we could not determine what group they belonged to are placed in the group unknown.

For many organizations it was immediately clear to which group they belonged. The remaining organizations where looked up on the Internet. Most organizations showed to have a website, which enabled us to classify them. However, not always a website in a language readable to us was available.

In Boom and Svendsen (2000) we concluded that environmental organizations would be most active at the international level. Furthermore, we

[4]see the Appendix for the specified lists of organizations for each CoP

Table 3: Observers present at CoP meetings: international level

	Kyoto '97	Buenos Aires '98	Bonn '99
Industry	340	415	462
Energy Intensive	193	219	178
Environmental Organizations	629	576	442
Labor Unions	15	74	31
Other Energy	103	172	163
Neutral	493	268	377
Unknown	9	14	16

expected that industry as a whole would not be very well represented. However, heavy industry would be rather active at the international level. We did not expect to see much lobbyism by workers unions.

The evidence in Table 3 largely confirms our predictions. Environmental organizations are better represented than industry both in Kyoto and in Buenos Aires. However, in Bonn, industry is better represented than environmental organizations. At all conferences, workers unions represented by far less members than industry and environmental organizations.

The numbers given in table 3 have to be considered with caution. In our analysis we only looked at the preferences of interest groups for international emission trading scheme. However, the members of the different NGOs present at the three conferences did not attend it solely to lobby for a certain trading scheme. Other interests, such as emission level where also put forward. This is especially true of the Kyoto conference, which determined the level of emission reduction for the industrialized countries. This is, to some degree, also reflected in table 3. Representation by environmental organizations is highest in Kyoto and falls at later conferences. This may reflect that environmental organizations are more interested in the level of emission reduction than in the implementation of the measures. The conferences after Kyoto did not deal with the level of emission reduction, but with the elaboration and implementation of the Kyoto Protocol. On the other hand, the attendance of industry has risen since Kyoto. This may reflect their strong interest in the elaboration of the different flexible instruments.

The data in Table 3 shows that environmental organizations are strongly organized at the international level. However, many of the important decisions concerning the design of an international emissions trading scheme are taken at the national level. It may very well be that industry is stronger organized at the national level than environmental organizations are. Therefore, in the end, industry may have a greater influence on the outcome of the

political decision making process than environmental organizations.

5 Conclusions

The intention of this paper was to identify which national instruments and which international emissions trading schemes are politically most feasible. To shed some light on this, we presented empirical evidence on the preferences of industry and environmental organizations for national instrument and international emissions trading scheme. Furthermore, we presented data which could give some insight in the rent-seeking strength of both interest groups.

With respect to industry, we found that they prefer voluntary agreements at the national level. Reasons for this are that industry sees them as cost-effective, flexible and environmentally effective. At the same time, industry rejects taxes and emission ceilings. Overall, there is little support for emissions trading at the national level. At the international level, industry prefers trading between private entities. However, no distinction was made between permit trading and credit trading. We argued though that this preference for private trading implies a preference for credit trading. A prerequisite for international permit trading is a system of tradable permits at the national level. Since industry prefers voluntary agreements at the national level, international private trading can not be conducted as permit trading. Hence, the only option is credit trading. It is rather unclear whether industry is aware of this implication of their choice of voluntary agreements at the national level. Industry speaks out strongly against limitations on trade. Government trading is however almost never mentioned.

Environmental organizations give no clear preference for national nor international instrument. This is consistent with the hypothesis that environmental organizations are only concerned with the level of emissions and with the certainty that it will be achieved and not, or at least very little, with how this level is reached. The only thing on which environmental organizations are very clear, and almost united, is a demand for limits on trading. The reason for this is that they want to ban trading in hot air and in general want the majority of emission reductions to be realized domestically and not through trading.

As concerned the level of organization and thereby the rent-seeking activity, we were able to find some data on rent-seeking at the international level. These show that initially, at the Kyoto conference, environmental organizations were much better represented than industry. At subsequent conferences, Buenos Aires and Bonn, environmental organizations become

less well represented, while industry is better represented. The explanation for this is that in Kyoto the level of emission reductions was discussed, while Buenos Aires and Bonn dealt more with the implementation of measures.

In all, the empirical evidence supports the theoretical analysis we made in an earlier paper (Boom and Svendsen (2000)). The only dissonant is that we found no strong support for our hypothesis that industry supports government trading as a complement to credit trading. However, industry shows an expectancy that governments will trade among each other.

Since environmental organizations are almost all silent about their preference for both a national instrument and for international emissions trading scheme, they will not have an impact on policy on this point. It is therefore more likely that the lobby from industry is more effective. Hence, we expect that voluntary agreements with relative targets will be a common instrument, although some countries may use tradable permits. At the international level, we expect firms will trade through credit trading. The only issue on which environmental organizations have an opinion is on caps on trading. Here their view is diametrically opposed to that of industry. Although some countries may introduce caps on trading, we do not expect that all countries will do so. Especially the US, Russia and the Ukraine have a preference for trading in hot air and are thereby opposed to limits on trading.

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A Attendance of NGOs at the Conferences of the Parties 1997-1999

A.1 CoP 3 (Kyoto 1997)

Table 4: Industry

Energy Intensive Industry	
American Portland Cement Alliance	2
Australian Aluminium Alliance	4
Australian Automobile Association	1
Australian Coal Association	5
Canadian Electricity Association	4
Canadian Vehicle Manufacturers Association	1
Competitive Enterprise Institute	5
Edison Electric Institute	25
Global Climate Coalition	63
Information Agency of the German Power Plants	1
International Climate Change Partnership	29
International Federation of Industrial Energy Consumers	4
International Gas Union	4
International Organization of Motor Vehicle Manufacturers	3
International Petroleum Industry Environmental Conservation Association	10
International Tropical Timber Organization	1
International Union of Producers and Distributors of Electrical Energy	7
Interstate Natural Gas Association of America	2
National Mining Association	5
OPEC	8
The Climate Council	6
Union of Industrial and Employers' Confederations of Europe	2
World Coal Institute	1
Total Energy Intensive Industry	**193**
Neutral/Unknown Industry	
Business Council of Australia	1
European Insulation Manufacturers Association	1
European Roundtable of Industrialists	2
Federal Association of the German Industry	6

International Chamber of Commerce	115
International Organization for Standardization	1
The Business Roundtable	2
World Business Council for Sustainable Development	19
Total Neutral/Unknown Industry	**147**
Total Industry	**340**

Table 5: Environmental Organizations

A SEED Europe	23
Alliance for Responsible Athmospheric Policy	8
Alliance for Responsible Environmental Alternatives	1
Association Francaise du Froid	2
Atmosphere Action Network in East Asia	13
Birdlife International	1
Center for Clean Air Policy	5
Center for International Environmental Law	4
Citizens Coalition for Economic Justice	1
Climate Action Network	83
Climate Institute	24
Earth Action	1
Earth Council	4
Environmental Defense Fund	12
European Environmental Bureau	1
FOE	37
German NGO-Forum on Environment & Development	1
Germanwatch	8
Global Commons Institute	9
Global Legislators Organisation for a Balanced Environment	50
Green Earth Organization	8
Green Fingers Society for Environment Protection	4
Green Korea United	7
Greenpeace International	45
International Council for Local Environmental Initiatives	116
International Institute for Energy Conservation	5
International NGO Forum for Ozone Layer Protection and Against Global Warming	1
International Society of Doctors for the Environment	3
International Society on Optics within Life Sciences	1

Natural Resource Use' Group	3
Natural Resources Defense Council	6
Öko-Institut	3
Ozone action	3
Rainforest ReGeneration Institute	1
Redefining Progress	1
Réseau Action Climat France	11
Sierra Club of Canada	1
The David Suzuki Foundation	9
The Nature Conservancy	7
The Rockefeller Foundation	3
Union of Concerned Scientists	4
US Climate Action Network	39
World Conservation Trust	7
World Watch Institute	2
Wuppertal Institute for Climate	15
WWF	36
Total Environmental Organizations	**629**

Table 6: Labor Unions

Energy-intensive	
International Federation of Chemical, Energy, Mine and General Workers' Union	1
Construction, Forestry, Mining and Energy Union	1
United Mine Workers of America	3
Total Energy-intensive	**5**
Neutral/Unknown	
American Federation of Labor	4
Industrial Union Department	3
International Confederation of Free Trade Unions	2
Confederation Sindical de Comisiones Obreras	1
Total Neutral/Unknown	**10**
Total Labor Unions	**15**

Table 7: Neutral

African Centre for Technology Studies	2
Agency for Cultural and Technical Co-operation	1
Alliance internationale de Tourisme	1
American Society of International Law	3
Asian development Bank	22
Berne Declaration	1
Caribbean Community Secretariat	1
Center for international and European Environmental research	1
Center for International Climate and Environmental Research	2
Center for Sustainable Development in the Americas	2
Central American Commission on the Environment & Development	1
Centre for Applied Studies in International Negotiations	1
Church of the Brethren	1
Columbia Earth Institute	7
Commission for Environmental Cooperation	1
Convention to Combat Desertification	2
Economic and Social Commission for Asia and the Pacific	1
Embassy of Peru	2
Embassy of the Russian Federation	1
Environmental and Natural Resources Law Centre	1
European Bank for Reconstruction and Development	4
European Business Council for a Sustainable Energy Future	21
European Conference of Ministers of Transport	2
European Science and Environment Forum	3
Federal assembly of the Russian Federation	1
Foundation for International Environmental Law and Development	1
Franciscans International	23
Free University Berlin	2
German Advisory Council on Global Change	2
Global Dynamics Institute	10
Global Environment Facility	10
Grip-Québec	1
Industrial Technology Research Institute	11
Institut de recherche sur l'environnement	1
Insurance Industry Initiative for the Environment	7

Intergovernmental Oceanographic Commission	2
International Academy of the Environment	1
International Atomic Energy Agency	3
International Council of Environmental Law	1
International Council of Scientific Unions	1
International Education Resource and Innovation Centre	1
International Energy Agency	16
International Maritime Organization	1
International Network for Environmental Management	1
International Union of Public Transport	1
International Youth and Student Movement for UN	8
Korea Institute of Science & Technology Europe	12
Lancaster University	1
Midwest Research Institute	2
Ministry of Foreign Affairs	2
National Association of Regulatory	2
National Association of State Fire Marshals	4
Netherlands Economic Institute	2
OECD	14
Pacific Rim Consortium	3
Permanent Commission for the South pacific	2
Potsdam Institute for Climate Impact Research	2
Ramsar Convention on the Wetlands	1
Resources for the Future	2
Russian Federal Forest Service	1
Russian Federal Service for Hydrometeorology and Environmental Monitoring	2
Scientists for Global responsibility	35
Southern Research Institute	1
South Pacific Regional Environment Programme	3
Sovereignty International	10
Stockholm Environment Institute	7
Tata Energy Research Institute	20
Thailand Environment Institute	1
The Fridtjof Nansen Institute	2
The Netherlands Energy Research Foundation	4
The Royal Institute of International Affairs	3
The Woods Hole Research Center	6
UNDP Global Environment Facility	3
UNEP Association for Japan	2
UNEP International Environmental technology Centre	19

United Methodist Church	3
UN	51
UN University	6
University of Kassel	2
University of Oslo	1
University of Utrecht	1
Verification Technology Information Centre	3
WMO/UNEP	7
World Bank	8
World Conference on religion and peace	13
World Council of Churches	14
World Food programme	2
WHO	3
World Energy Council	6
World Meteorological Organization	4
World Resources Institute	11
WTO	1
Total Neutral	**493**

Table 8: Other Energy

European Association for Promotion of Cogeneration	30
European Atomic Forum	14
European Wind Energy Association	4
International Solar Car Federation	3
Nuclear energy Institute	11
Renewable Energy Systems Ltd.	1
Solar Electric Light Fund	1
Solar Net	2
The Business Council for Sustainable Energy	27
The Solar Century	3
The Uranium Institute	7
Total Other Energy	**103**

Table 9: Unknown

Association Tunisie Mediterranée Pour Le Développement Durable	1
Canadian Global Change Program	1
Centre for Business and the Environment	1
E & Co.	1
Energy 21	1
Forests Absorbing Carbondioxide Emission	1
Institute of Global Climate and Ecology	1
International Institute of Refrigeration	1
Nord-Sud-Forum	1
Total Unknown	**9**

A.2 CoP 4 (Buenos Aires 1998)

Table 10: Industry

Energy-intensive	
Air Transport Association of America	1
American Portland Cement Alliance	2
Canadian Electricity Association	3
Canadian Vehicle Manufacturers' Association	1
Central Research Institute of Electric Power Industry	7
Competitive Enterprise Institute	4
Council of German Forest Owners Association	1
Edison Electric institute	34
Electric Power Research Institute	4
Global Climate Coalition	22
Information Agency of the German Power Plants	7
International Climate Change Partnership	29
International Federation of Industrial Energy Consumers	2
International Gas Union	9
Organisation Internationale des Constructeurs d'Automobiles	1
International Petroleum Industry Environmental Conservation Association	11

International Primary Aluminium Institute	6
International Union of Producers and Distributors of Electrical Energy	24
Japan Flon Gas Association	2
National Mining Association	3
The Climate Council	7
The Federation of Electric Power Companies	31
The Interstate Natural Gas Association of America	2
The Japan Electrical Manufacturers' Association	4
World Coal Institute	2
Total Energy Intensive	**219**
Neutral/Unknown Industry	
Business Council of Australia	2
Committee for a Constructive Tomorrow	3
European Roundtable of Industrialists	1
Federal Association of the German Industry	7
International Chamber of Commerce	46
International Organization for Standardization	1
Japan Federation of Economic Organizations	17
Lloyds Register of Shipping	2
The Center for Sustainable Development in the Americas	7
The Korea Chamber of Commerce and Industry	11
Union Industrial Argentina	9
Union of Industrial and Employers' Confederations of Europe	10
World Business Council for Sustainable Development	80
Total Neutral/Unknown Industry	**196**
Total Industry	**415**

Table 11: Environmental organizations

African Centre for Technology Studies	4
Alliance for Responsible Atmospheric Policy	10
Alliance for Responsible Environmental Alternatives	1
Association Francaise du Froid	1
Australian Conservation Foundation	3
Bellerive Foundation	1
Birdlife International	2
Center for Clean Air Policy	6

Center for International Environmental Law	4
Citizens Alliance for Saving the Atmosphere and Earth	11
Climate Action Network (Europe)	23
Climate Action Network (UK)	1
Climate Action Network (Souteast Asia)	3
Climate Institute	11
Climate Network Africa	11
Development Alternatives	1
Earth Council	6
Environmental Defense Fund	20
Environmental Development Action in the 3.world	4
European Environmental Bureau	1
European Federation for Transport and Environment	1
Field	3
Friends of the Earth	32
German NGO-Forum on Environment & Development	2
Germanwatch	20
Global Commons Institute	11
Global Environment Forum /Institute for International Studies	4
Global Environmental Forum	10
Global Environment Forum - Kansai	1
Global Legislators Organisation for a Balanced Environment	55
Greenpeace	23
Guinea Ecology	1
ICLEI	41
IIEC	3
ISDE	1
IWMC World Conservation Trust	5
Kiko Network	25
Klima-Bündnis	2
Korean federation for Environmental Movement	14
Natural Resource Users' Group	2
Natural Resources Defense Council	7
Netherlands Committee for IUCN	4
Öko-Institut	4
Ozone Action	3
Peoples Forum 2001	6
Pollution Probe	1
Prima Klima	2

Reseau Action Climat France	9
Rainforest Regeneration Institute	2
Rockefeller Foundation	2
Tellus Institute	1
The David Suzuki Foundation	3
The Nature Conservancy	24
The Pew Center on Global Climate Change	7
The World Conservation Union	21
Union of Concerned Scientists	4
US Climate action Network	39
Woods Hole Research Center	5
World Watch	2
Wuppertal Institute for Climate, Environment and Energy	3
WWF	47
Total Environmental Organizations	**576**

Table 12: Labor Unions

Energy-intensive	
United Mine Workers of America	3
World Council of Nuclear Workers	62
Total Energy Intensive Labor Unions	**65**
Neutral/Unknown	
International Confederation of Free Trade Unions	9
Total Neutral Unknown Labor Unions	**9**
Total Labor Unions	**74**

Table 13: Neutral

Alliance Internationale de Tourisme	1
Asian Institute of Technology	1
Batelle Memorial Institute	1
Carl Duisberg Society	1
CEDARENA	1
Center for Energy Policy	1
Center for environmental Information Inc.	1
Counterpart International	1

ECOLOGIC	1
Cicero	3
Center for Business and the Environment	2
Centre for European Economic Research	2
Centra for Science and Environment	4
Columbia Earth Institute	1
E & Co.	2
Emissions Marketing Association	7
European Business Council for a Sustainable Energy Future	6
Foundation Joint Implementation Network	1
Franciscans International	33
Fraunhofer Society	1
Free University Berlin	2
German Advisory Council on Global Change	1
Global Industrial and Social Progress Research Institute	2
Global Network Class	26
Hadley Centre for Climate Prediction and Research	3
Hamburg Institute for Economic Research	2
Indira Gandhi Institute of development Research	2
Industrial Technology Research institute	9
Institut de Recherche sur L'environnement	1
Institute for Environmental Studies, Free University Amsterdam	3
Institute on Global Conflict	17
International Academy of the Environment	11
International Centre for Trade and Sustainable Development	1
International Centre for Applied Systems Analysis	1
International Network for Sustainable Energy	1
International Union of Public Transport	2
Loss Prevention Council	2
Massachusetts Institute of Technology	3
National ass. Of Regulatory Utility Commissioners	5
National Ass. Of State Fire Marshalls	2
New energy and Industrial technology Org.	10
The Pacific rim Consortium for Energy Combustion and the Environment	2
Potsdam Institute for Climate Impact Research	1
Resources for the Future	3
Sovereignty International	4
State and Territorial Air Pollution Program Administrators/Ass. of Local Air Pollution Control Off.	5
Stockholm Environment Institute	12

Tata Energy Research Institute	11
The Fridtjof Nansen Institute	4
The Institute for Global Environmental Strategies	13
The Institute of Cultural affairs	4
The Royal Institue of International Affairs	3
University of Keele	1
University of South Africa	2
University of Washington	1
Verification Technology Information Centre	1
World Conference on Religion and Peace	3
World Council of Churches	4
World Energy Council	3
World resources Institute	14
Total Neutral	**268**

Table 14: Other Energy

American Nuclear Society	7
European Association for the Promotion of Cogeneration	17
European Atomic Forum	13
European Nuclear society	23
European Wind Energy Association	19
Fonds E7 pour le Developpement Energetique Durable	38
International solar Energy Society	1
Japan Atomic Industrial Forum Inc.	1
Nuclear energy Institute	10
Solar electric Light Fund	2
The Business Council for sustainable energy	38
The Uranium Institute	3
Total Other Energy	**172**

Table 15: Unknown

Agence de Cooperation	1
Earth Science and Technology Organization	2
Face Foundation	2
International Lake Environment Committee Foundation	1
Research for Man and the Environment	2
The National Center for Public Policy Research	2
The Science and Environmental Policy Project	4
Total Unknown	**14**

A.3 CoP 5 (Bonn 1999)

Table 16: Industry

Energy- Intensive Industry	
Air Transport Association of America	2
American Portland Cement Alliance	2
Canadian Electricity Association	1
Canadian Vehicle Manufacturers' Association	1
Central Research Institute of Electric Power Industry	5
Edison Electric Institute	12
Electric Power Research Institute	3
Enterpriseworks Worldwide	3
European Union of the Gas Industry	8
Global Climate Coalition	22
International Climate Change Partnership	28
International Federation of Industrial Energy Consumers	1
International Gas Union	4
Organisation Internationale des Constructeurs d'Automobiles	1
International Petroleum Industry Environmental Conservation	14
International Primary Aluminium Institute	9
International Union of Producers and Distributors of Electrical Energy	17
The Climate Council	5
The Federation of Electric Power Companies	34

The Interstate Natural Gas Association of America	1
The Japan Electrical Manufacturers' Association	1
World Coal Institute	3
World LP Gas Association	1
Total Energy Intensive Industry	**178**
Neutral/Unknown Industry	
British Fire Protection Systems Association	4
Business and Industry Advisory Committee to the OECD	3
Business Council for Sustainable Development	6
Business Council for Sustainable Energy	27
Business Council of Australia	1
Confederation Européenne des Propriétaires Forestiers	22
Council of German Forest Owners	8
Euroheat & Power, Unichal	1
European Landowners Organisation	2
International Chamber of Commerce	47
International Institute of Refrigeration	1
International Organization for Standardization	5
Japan Federation of Economic Organizations	23
Japan Fluorcarbon Association	5
Lloyds Register of Shipping	3
The Business Roundtable	4
The Center for Sustainable Development in the Americas	5
The Korea Chamber of Commerce and Industry	25
Union of Industrial and Employers' Confederations of Europe	38
World Business Council for Sustainable Development	54
Total Neutral/Unknown Industry	**284**
Total Industry	**462**

Table 17: Environmental Organizations

Alliance for Responsible Atmospheric Policy	11
Alliance for Responsible Environmental Initiatives	1
Association Francaise du Froid	2
Australian Conservation Foundation	1
Birdlife International	1
Center for Clean Air Policy	7

Center for International Environmental Law	4
Citizens Alliance for Saving the Atmosphere and Earth	18
Climate Action Network	46
Development Alternatives	1
Earth council	7
Ecologic Foundation	1
Environmental Defense Fund	15
Environnement et Dveloppement du Tiers Monde	4
European Federation for Transport and Environment	2
Foundation for International Environmental Law and Development	5
Friends of the Earth	18
Global Commons Institute	7
Global Environmental Action	8
Global Environmental Forum	6
Global Legislators Organisation for a Balanced Environment	5
Green Earth Organization	3
Greenpeace	19
Institute Ecoar for Citizenship	2
Institute for European Environmental Policy	5
International Council for Local Environmental Initiatives	7
International Institute for Energy Conservation	3
International Institute for Sustainable Development	2
International Project for Sustainable Energy Paths	1
International Society on Optics within Life Sciences	1
IUCN	8
Kiko Network	15
Klima-Bündnis	10
Korean Federation for Environmental Movement	1
Lead-Europe	31
National Environment Trust	14
Natural Resource Users' Group	2
Natural Resources Defense Council	3
Ozone action	3
Peoples Forum 2001	14
Reseau Action Climat France	14
Tellus Institute	1
The David suzuki Foundation	2
The Nature Conservancy	18
The Pew Center on Global Climate Change	19
Union of Concerned Scientists	3
US Climate Action Network	36

Vitae Civilis	2
Woods Hole Research Center	6
World Watch	2
WWF	25
Total Environmental Organizations	**442**

Table 18: Labor Unions

Energy-intensive	
National Mining Association	3
United Mine Workers of America	3
World Council of Nuclear Workers	8
Total Energy Intensive Labor Unions	**14**
Neutral/Unknown	
International Confederation of Free Trade Unions	6
Japanese Trade Union Confederation	10
Confederation Sindical de Comisiones Obreras	1
Total Neutral/Unknown Workers Unions	**17**
Total Labor Unions	**31**

Table 19: Neutral

Aikalainen	19
Alliance Internationale de Tourisme	2
American Society of International Law	1
Asian Institute of Technology	1
Bangladesh Centre for Advanced Studies	6
CEDARENA	1
CEE Bankwatch Network	5
Center for Energy Policy	15
Center for International and European Environmental Research	7
Cicero	8
Centre for Business and the Environment	3
Center for european Economic Research	9
Columbia University	2
Counterpart International	2
E & Co.	5

Emissions Marketing Association	17
European Business Council for a Sustainable Energy Future	33
Federation of Canadian Municipalities	1
Foundation Joint Implementation Network	2
Franciscans International	13
Global Dynamics Institute	8
Global Industrial and Social Progress Research Institute	3
Hadley Centre for Climate Prediction and Research	6
Helio International	12
Industrial technology Research Institute	13
Institut de Recherche sur L'Environnement	1
Institute for Environmental Studies	1
Insurance Industry Initiative for the Environment, in Association with UNEP	6
International Council of Environmental Law	1
International council of Scientific Unions	7
International Council of Women	1
International Network for Sustainable Energy	5
International Union of Public Transport	2
Korea Institute of Science and Technology Europe	2
Kyoto University	9
Lancaster University	1
Loss Prevention Council	1
Massachusetts Institute of Technology	10
Midwest Research Institute	3
National Association Of Regulatory Utility Commissioners	2
National Association Of State Fire Marshalls	2
New Energy and Industrial Technology Development Organization	14
Princeton University	17
Proclim	8
Railway Technical Research Institute	1
Resources for the Future	4
Sovereignty International	5
State and Territorial Air Pollution Program Administrators/Ass. Of Local Air Pollution Conntrol Off.	2
Stockholm Environment Institute	3
Tata Energy Research Institute	12
The Fridtjof Nansen Institute	5
The Institute for Global Environmental Strategies	13
The Netherlands Energy Research Foundation	1
The Royal Institute of International Affairs	3

Tsinghua University	1
University of California	3
University of Cape Town	2
University of Oslo	1
University of St. Gallen	5
Verification Research Training and Information Centre	3
World Conference on Religion and Peace	4
World Council of Churches	6
World Energy Council	3
World Resources Institute	13
Total Neutral	**377**

Table 20: Other Energy

American Nuclear Society	7
Canadian Nuclear Association	4
European atomic Forum	38
European Nuclear Society	43
European Wind Energy Association	17
Fonds E7 Pour le Developpement Energetique Durable	23
International Cogeneration Alliance	15
Japan Atomic Industrial Forum	1
Nuclear Energy Institute	5
Solar electric Light Fund	2
The Solar Century	2
The Uranium Institute	4
Thermal and Nuclear Power Engineering society	2
Total Other Energy	**163**

Table 21: Unknown

Cercle Mondial du Consensus	2
Face Foundation	1
Fundacion Biosfera	5
Japanese Industrial Conference for Ozone Layer protection	1
Fundacion Jorge Esteban Roulet	1
National Institue of Public health and the Environment	5
Young Power in Social Action	1
Total Unknown	**16**