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The Climate Change Regime: Interactions with ICAO, IMO, and the EU Burden-Sharing Agreement

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Reflecting the vast scope and complexity of the climate change challenge, the international regime on climate change is one of the broadest and most complex international governance systems in the field of the environment and beyond. Representing the biggest environmental challenge at the beginning of the twenty-first century, climate change has a variety of impacts on the natural environment and on human society. Various human activities and sectors of society contribute to the problem and will, therefore, be influenced by any effective policy response (IPCC 2001a, 2001b). Consequently, the climate change regime is one of the politically most important international environmental institutions and spans an enormous scope. Since international negotiations on a UN Framework Convention on Climate Change began in 1991, the growth in the number, detail, and complexity of the relevant international rules has become particularly apparent with the adoption of the 1997 Kyoto Protocol and the subsequent elaboration of its provisions, including a number of innovative elements such as emissions trading and opportunities to take credit for forestry activities (e.g., Oberthür and Ott 1999; Yamin and Depledge 2004).

Given its enormous scope, it is hardly surprising that the climate change regime interacts with a great number of other international institutions and EU legal instruments, as further detailed in this chapter. The chapter first briefly introduces the main elements of the international regime on climate change. This is followed by an overview of the major interactions of the climate change regime with other international institutions and EU legal instruments. The chapter then focuses on the interaction with three other institutions in more detail. The interaction with the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO) exemplifies the at times problematic relationship of the climate change regime with institutions from other policy fields. The climate change regime's request to the IMO and ICAO to restrict greenhouse gas emissions from

international transport raised the issue of which of the institutions involved should possess regulatory authority in this respect. The request has largely failed to draw an effective response to date, because the requested restrictions are not in the immediate interest of the target institutions. Similar issues arise more frequently especially between environmental and economic institutions. Subsequently, the chapter analyzes the climate change regime's interaction with the agreement on differentiated emission limitation and reduction commitments of EU member states ("Burden-Sharing Agreement"). This interaction provides an example of how EU legal instruments can facilitate and strengthen international environmental governance. This rather positive perspective on the EU Burden-Sharing Agreement contrasts with the harsh criticism by several non-EU countries. The concluding section summarizes the findings.

The International Regime on Climate Change

The international regime on climate change is built on two international treaties, the UN Framework Convention on Climate Change (UNFCCC) of 1992 and its Kyoto Protocol adopted in 1997 (Bodansky 1993; Oberthür and Ott 1999). The rules under the Kyoto Protocol were further specified in agreements reached in 2001 (Bail, Marr, and Oberthür 2003). As of mid-2005, the Convention had 189 parties and the Protocol had been ratified by 150 countries and the EU. The EU and its member states are all parties to both the Convention and the Protocol.[1] The Kyoto Protocol entered into force in February 2005. However, the new U.S. President George Bush in March 2001 decided not to ratify the Kyoto Protocol.

The Convention established the regime by defining the principles that guide its development (Art. 3) and its ultimate objective: to stabilize atmospheric concentrations of greenhouse gases (GHGs) "at a level that would prevent dangerous anthropogenic interference with the climate system" (Art. 2). It also established the soft aim that industrialized countries would strive to return their GHG emissions to 1990 levels by 2000. It covers all GHGs "not controlled by the Montreal Protocol" for the protection of the ozone layer and establishes that removals by sinks such as forests are to be taken into account.

The Kyoto Protocol for the first time establishes legally binding emission-reduction commitments for industrialized countries. These differentiated commitments must amount to an overall reduction of at least 5 percent from 1990 levels by 2008–2012 (the "commitment period"). The commitments cover carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and three (groups of) fluorinated

gases, namely hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Removals and emissions of GHGs from afforestation, reforestation, and deforestation are to be accounted for (Art. 3.3). In addition, parties agreed in 2001 that forest management and agricultural activities (cropland management, grazing-land management, and revegetation) could be taken into account as additional sink categories under Article 3.4 of the Protocol (Bail, Marr, and Oberthür 2003).

The Protocol furthermore establishes three innovative "Kyoto Mechanisms" that allow countries to meet their emission obligations by acquiring emission credits from abroad. An emissions-trading system allows industrialized countries with excess emission allowances to transfer them to other countries in need of such allowances (Art. 17). Under the "Joint Implementation" (JI) scheme according to Article 6 of the Protocol, an investor and a host industrialized country can generate additional emission reductions by implementing a suitable project jointly, with the investor receiving (part of) the resulting emission credits. Similarly, industrialized countries can invest in emission-reduction projects (including sinks projects) in developing countries to earn additional emission credits under a Clean Development Mechanism (CDM, Art. 12). Further rules and guidelines on the operation of the Kyoto Mechanisms form part of the agreements reached in 2001 (Bail, Marr, and Oberthür 2003).

The institutional structure of the UNFCCC and the Kyoto Protocol are closely related. The Conference of the Parties (COP), which usually meets once a year, is the supreme decision-making body of the Convention. It is assisted by two standing subsidiary bodies, the Subsidiary Body for Scientific and Technological Advice (SBSTA) and the Subsidiary Body for Implementation (SBI). The Convention furthermore establishes a financial mechanism to assist developing countries in their implementation, which is operated by the Global Environment Facility (GEF), and a secretariat (located in Bonn). It also acknowledges the role of the Intergovernmental Panel on Climate Change (IPCC) established by the WMO and UNEP in 1988 to provide scientific advice to its parties. Since no rule on voting could be agreed, all decisions under the Convention have so far required consensus. Until the entry into force of the Protocol in February 2005, the development of the regime occurred in the framework of the Convention. Whereas the Subsidiary Bodies and the financial mechanism of the Convention as well as the secretariat are also adapted to serve under the Protocol, the COP sessions concurrently serve as the meeting of the parties to the Protocol (COP/MOP). In addition, parties to the Protocol have

elaborated detailed rules on reporting, monitoring, and review of information as well as a compliance system to determine and address cases of noncompliance (Bail, Marr, and Oberthür 2003; Yamin and Depledge 2004).

The Climate Change Regime as Source and Target of Institutional Interaction

The climate change regime interacts with many other environmental and nonenvironmental international institutions and EU legal instruments. Twenty-four specific cases of horizontal and vertical institutional interaction are listed in table 3.1. This list is not necessarily exhaustive. Not included are numerous cases in which a specific interaction has not occurred yet and/or the causal pathway leading from one institution to the other is rather long. For example, trade liberalization advanced by the World Trade Organization (WTO) may lead to rising GHG emissions due to induced growth in international trade, as may the EU Single Market. Furthermore, effective climate protection may prevent the spreading of health diseases (relevant to the World Health Organization, WHO), help efforts to preserve biological diversity (Convention on Biological Diversity, EU Habitats Directive) and wetlands (Ramsar Convention) and combat desertification (Convention to Combat Desertification), and so on (see IPCC 2001a). In other instances, a potential for the emergence of future interaction exists, for example between the Kyoto Mechanisms and the WTO (e.g., Chambers 1998, 2001; Charnovitz 2003). In these cases, the interaction has so far remained rather indirect and unspecific. Furthermore, more EU legal instruments affect GHG emissions, but including them would have been beyond the scope of this study.

All major causal mechanisms of institutional interaction are represented in the twenty-four cases. Cognitive Interaction is apparent from the model function that the compliance procedure of the Montreal Protocol has performed in the elaboration of the compliance system of the Kyoto Protocol. The Montreal Protocol has also served as a model that was not accepted (due to a blocking minority) with respect to the establishment of technology and economic assessment panels. Other international institutions have also served as templates of various elements of the climate change regime, but including them would have been beyond the scope of this chapter.

In other instances, the commitments entered into under the climate change regime have affected the rules of other international institutions and EU legal instruments (Interaction through Commitment). Thus, the GEF operates the financial mechanism

Table 3.1
Interactions of the Climate Change Regime

Montreal Protocol on Substances That Deplete the Ozone Layer	• Has served as a model in several respects (e.g., compliance procedure) Has served as a model that was blocked by a minority with respect to the establishment of technology and economic assessment panels • Has helped phase out ozone-depleting substances that are also potent GHGs • Has supported use of fluorinated GHGs regulated under the Kyoto Protocol (while the latter has provided a disincentive for such use to replace ozone-depleting substances)
Convention on Biological Diversity	• May suffer from establishment of monocultural tree plantations induced by climate change regime
Ramsar Convention on Wetlands	• May benefit from additional resources for wetland management or suffer from conversion of wetlands for carbon sequestration induced by climate change regime
Convention to Combat Desertification	• May benefit from forestry activities promoted under the climate change regime that help combat desertification
International Civil Aviation Organization	• Was asked by climate change regime to act on GHG emissions from international aviation
International Maritime Organization	• Was asked by climate change regime to act on GHG emissions from international shipping
World Trade Organization	• Is used as a major argument against elaboration of trade-relevant climate-protection measures (“chill effect”)
World Bank	• Has greened its policies to some extent in response to the climate change regime
Global Environment Facility	• Has been asked to operate the financial mechanism of the climate change regime
EU Landfill Directive	• Results in reductions of methane emissions and thus helps implement the Kyoto Protocol
EU Renewable Energy Directive	• Is to result in increasing use of non-GHG-emitting energy sources and thus helps implement the Kyoto Protocol
EU Directive on the Internal Market for Electricity	• Is expected to result, inter alia, in lower energy prices counteracting efforts to save energy and reduce GHG emissions
EU Directives on car emission standards	• Require cars to be equipped with catalytic converters, leading to increases of GHG emissions

Table 3.1
(continued)

EU GHG monitoring	• Responds to international reporting and monitoring requirements under the Kyoto Protocol
EU Burden-Sharing Agreement	• Facilitated agreement on and strengthened targets under Kyoto Protocol • Was codified in supranational EU law in response to Kyoto Protocol • Helps implement the Kyoto Protocol by strengthening enforcement in the EU
EU Regulation and Directive on fluorinated greenhouse gases	• Was triggered by the Kyoto Protocol • Is expected to lead to reductions of emissions of fluorinated GHGs
EU Emissions Trading Directive	• Was triggered by the Kyoto Protocol • Is expected to result in reductions of GHG emissions

of the climate change regime and the World Bank has to some extent made its policies more climate-friendly. As discussed further in the next section, ICAO and IMO have initiated some activities to address GHG emissions from international transport in response to a request by the Kyoto Protocol. Furthermore, the climate change regime has shaped the EU's legislation implementing the Kyoto Protocol, including the EU GHG monitoring mechanism, the EU regulatory framework on fluorinated GHGs, the codification of the EU Burden-Sharing Agreement, and the EU Emissions Trading Directive. The climate change regime has also been the target of Interaction through Commitment. For example, free-trade commitments under the WTO (chapter 8) have contributed to preventing elaboration of trade-related climate protection measures. In contrast, the EU's commitment to its Burden-Sharing Agreement facilitated and strengthened the Kyoto Protocol, as analyzed further in this chapter.

The climate change regime has also served as a source and a target of Behavioral Interaction. The EU Landfill Directive, the Renewable Energy Directive, the Emissions Trading Directive, EU rules on the internal market for electricity, the directives on car emission standards, the EU Burden-Sharing Agreement, the EU regulatory framework on fluorinated GHGs, the IPPC Directive (chapter 9), and other EU legal instruments affect the level of GHG emissions within the EU. The Montreal Protocol has had synergistic and disruptive effects by phasing out ozone-depleting substances such as chlorofluorocarbons (CFCs) that are also potent GHGs, while encouraging

the use of other fluorinated GHGs (Oberthür 2001). The Kyoto Protocol, in turn, provides incentives for forestry activities that are expected to support the objectives of the Convention to Combat Desertification (CCD). In contrast, the Protocol is likely to have a disruptive effect on the Convention on Biological Diversity (CBD) by providing incentives for investments in fast-growing monocultural forest plantations (Pontecorvo 1999; see also chapter 4). It may also violate the prohibition of dumping at sea under the OSPAR Convention for the protection of the Northeast Atlantic by providing an incentive to sequester CO_2 in North Sea oil fields (chapter 5). Due to scientific uncertainties, uncertain behavioral effects, and unknown application of rules in practice, the behavioral effects of the climate change regime are not always unambiguously synergistic or disruptive. For example, whether and to what extent wetland conservation and management regulated under the Ramsar Convention on wetlands will benefit from additional resources made available through the climate change regime or may be harmed by conversion of wetlands for carbon sequestration depends heavily on the future development and application of relevant rules.

The relations of the climate change regime with nonenvironmental institutions have been disruptive more frequently than those with other environmental institutions. Of the five identified environmental-economic interactions with ICAO, IMO, the WTO, the World Bank, and the EU electricity market, all except the one concerning the World Bank have been disruptive. In contrast, only five of the about twenty interactions with other environmental institutions have resulted in disruptions (including the interaction with the OSPAR Convention; see chapter 5).

Political decision making can lead to improvements. For example, some decisions have been made in the framework of the climate change regime to mitigate the disruptive effect on the CBD (Jacquemont and Caparrós 2002). The relationship between the climate change regime and the CBD as well as the Convention to Combat Desertification and the Ramsar Convention and others are also actively managed to enhance synergy. Since most cases have a potential for further improvement, the situation may change in the future.

Requesting Change from Unfriendly Institutions: Regulatory Competition between the Kyoto Protocol and ICAO and IMO

Although climate change is not among their main concerns, ICAO and IMO started to address GHG emissions from international transport in response to a request

contained in the 1997 Kyoto Protocol. Both organizations have, however, been far from enthusiastic about the newly acquired task. The limited action they have taken has mainly been driven by the threat of regulation by the climate change regime and of unilateral action by major players. A more elaborate analysis of this case of Interaction through Commitment can be found in Oberthür 2003.

Structure and Objectives of ICAO and IMO

ICAO and IMO are the prime international organizations responsible for international aviation and shipping, respectively. Their major objectives are the promotion and enhancement of these modes of international transport. Shipping and aviation interests (owners, builders, operators) are their main stakeholders. As of mid-2005, ICAO had 188 and IMO 165 member states (http://www.icao.int; http://www.imo.org).

IMO possesses an Assembly of all parties, a Council with a limited membership elected by the Assembly, and various committees. Its supreme governing body is the Assembly. In between its biennial meetings, the Assembly's functions are largely performed by the Council. However, with respect to the central task of IMO—the elaboration of international agreements (Art. 3(b), IMO Convention)—the Council may not recommend adoption of regulations or amendments to such regulations on behalf of the Assembly. IMO agreements become binding on parties subject to their ratification (http://www.imo.org).

While ICAO also possesses an Assembly, a limited-membership Council, and various committees, its supreme governing body is the Council. The Assembly meets once every three years and provides general policy guidelines for the work of the other ICAO bodies framed in "Assembly Resolutions." The Council governs the organization in the interim. In addition to passing resolutions and recommendations, it adopts legally binding standards and recommended practices that are included in annexes to the ICAO Convention. An international standard adopted by the Council immediately binds all ICAO members that do not explicitly decide to deviate from the standard. Member states undertake to comply with the organization's regulations, which also apply over the high seas (Art. 12, ICAO Convention; see Buergenthal 1969; http://www.icao.int).

Both organizations have assumed at least partial competence for regulating environmental matters relating to their mode of international transport. In the case of IMO, such authority is an explicit part of its mandate. According to Article 1(a) of its Convention, the purposes of IMO include "to encourage the general adoption

of the highest practicable standards in matters concerning maritime safety, efficiency of navigation and the prevention and control of marine pollution from ships." Among the five open-ended committees of the organization is a Marine Environment Protection Committee (MEPC) that is primarily concerned with adopting and amending the organization's environmental conventions and reports to the Council and the Assembly. IMO has adopted a number of conventions addressing marine pollution and oil spills, most importantly the International Convention for the Protection of the Marine Environment from Pollution by Ships of 1973/78 (MARPOL 1973/78).

In contrast, environmental protection is not among the explicit objectives of ICAO (compare Art. 3, IMO Convention, and Art. 44, ICAO Convention). However, according to Article 44(d) of the ICAO Convention, the organization aims at, inter alia, meeting "the needs of the peoples of the world for safe, regular, efficient and economical air transport." The Convention allows for the establishment of committees as appropriate (Diederiks-Verschoor 1993, 36–40). The Committee on Aviation Environmental Protection (CAEP) that was established by the ICAO Council in 1983—superseding two committees on aircraft noise and aircraft engine emissions created in the 1970s—prepares the Council's decisions on environmental matters. ICAO has elaborated a limited number of environmental standards, most importantly regarding nitrogen oxide emissions of aircraft.

The Trigger of the Interaction: The Request by the Kyoto Protocol

A request of the climate change regime to ICAO and IMO marks the beginning of the interaction (figure 3.1). Article 2.2 of the Kyoto Protocol implicitly contains this request by committing industrialized countries to "pursue limitation or reduction of emissions of greenhouse gases not controlled by the Montreal Protocol from aviation and marine bunker fuels [i.e., the fuel sold to and burned by aircraft and ships in international transport], working through the International Civil Aviation Organization and the International Maritime Organization, respectively." It was the result of a political deadlock during the elaboration of the Kyoto Protocol. In protracted discussions, the parties to the UNFCCC were unable to reach agreement on how to deal with GHG emissions from international transport. Consequently, such emissions are not subject to the emission targets agreed on in Kyoto, and the parties decided to turn to ICAO and IMO (Oberthür 2003, 193).

International transport contributes a significant and growing share to global GHG emissions. According to the available data, international aviation and shipping

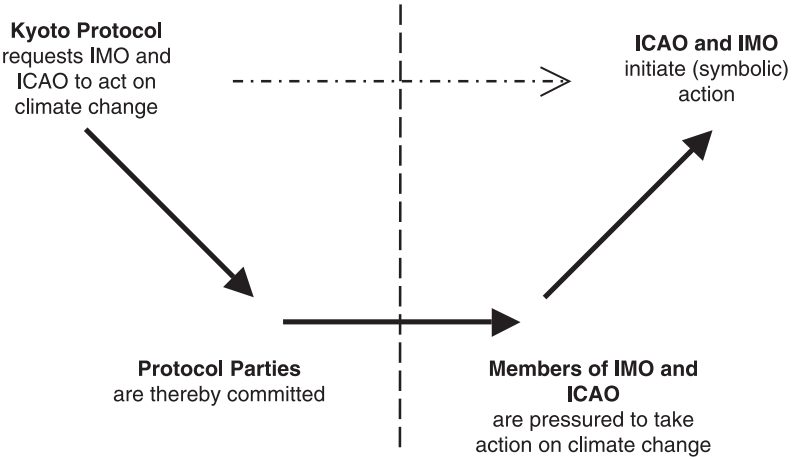

Figure 3.1
Kyoto Protocol triggers action by IMO and ICAO

account for about 4 percent of global CO_2 emissions in total. This is in the range of German CO_2 emissions in the 1990s. The IPCC has estimated the share of international aviation to have amounted to about 2 percent in 1992. Aviation's overall contribution to radiative forcing even amounted to 3.5 percent due to other factors (buildup of ozone, contrails, and so on). International shipping has been found to have been responsible for about 1.8 percent of global CO_2 emissions in 1996 (while accounting for a much larger volume of freight than air transport). While CO_2 emissions from aviation were set to increase dynamically by about 3 percent per year between 1990 and 2015, shipping emissions are to increase by at least 1–2 percent per year (IPCC 1999; IMO 2000; WBGU 2002; UNFCCC 2002). On the basis of these growth rates, emissions from international transport would double around 2020.

The request of the Kyoto Protocol increased the pressure on IMO and ICAO to address GHG emissions from international transport. The Protocol committed its parties (in particular industrialized-country parties) to take action on GHG emissions from international transport. Because of the large overlap in membership, this commitment essentially concurrently extended to most member states of IMO and ICAO. Furthermore, the commitment contained the implicit threat that restrictions on GHG emissions from aviation and marine bunker fuels could in principle be imposed under the climate change regime, which would be of immediate relevance to air and sea transport fostered by ICAO and IMO. The regulatory competition

with the climate change regime has been an important motivation for both organizations' efforts to deal with climate change. Thus, the ICAO Assembly called on the ICAO Council not to leave the initiative on aviation matters related to the environment "to other organizations" (Abeyratne 2001, 38). Less strongly, the IMO Assembly declared that IMO "should take the lead in developing GHG limitation and reduction strategies and mechanisms for international shipping" (IMO 2003). Overall, the case for taking action on climate change within both organizations was strengthened.

The threat of regulatory competition has, however, remained weak. First of all, the Kyoto Protocol only entered into force in 2005. In the interim, regulation of GHG emissions from international transport had basically fallen off the agenda of the UNFCCC for several years after Kyoto. Activities within the UNFCCC focused on, and remained confined to, improving the informational basis. Initiatives by the EU and others regularly failed to significantly advance the issue due to resistance in particular by the United States and oil-producing countries (Oberthür 2003, 199).

Another potential driving force, the threat of unilateral action, has also remained weak. Transnational aviation and shipping interests at times prefer uniform international regulation to a disparate regulatory environment with widely varying national standards. Norway introduced taxation of kerosene in spring 1999 but was forced to abandon the tax when international airlines complained and refused to pay (Oberthür and Ott 1999, 112). The EU has also considered introducing an emission charge/levy for (international) air transport for several years (European Commission 1999). In 2001, the EU Environment Council declared that the EU should take action if no concrete measures were agreed on within ICAO by 2002 (Council of the European Union 2001, para. 5). However, no specific action was in sight as of the end of 2004. Shipping has received less attention mainly due to the fact that it is considered relatively environmentally friendly as compared with air transport. Although the EU announced that the European Commission would identify and undertake specific actions to reduce GHG emissions from shipping if no such action was agreed on within IMO (ECON 2003, 19), no initiative has resulted yet.

The Response by ICAO and IMO: Slow with Uncertain Results

Although they had recognized the problem of climate change before, both ICAO and IMO started to consider effective action on GHG emissions primarily in response to the Kyoto Protocol. ICAO had emphasized the need for further study of

the problem in the early 1990s (Crayston 1993, 53) and requested the aforementioned Intergovernmental Panel on Climate Change (IPCC) in 1996 to prepare what became the IPCC Special Report on Aviation and the Global Atmosphere (IPCC 1999). Referring to the Kyoto Protocol, the thirty-second ICAO Assembly in 1998 then asked the CAEP "to study policy options to limit or reduce the greenhouse gas emissions from civil aviation, taking into account the findings of the IPCC special report and the requirements of the Kyoto Protocol" (ICAO 1998, Appendix F; see also Crayston and Hupe 2000, 32). IMO first addressed the issue in September 1997 when the Kyoto Protocol was already looming. An IMO conference called on the organization to undertake a study of CO_2 emissions from ships and the MEPC to identify feasible CO_2-reduction strategies. In November 1998, the MEPC decided to commission a study on GHG emissions from ships, noting explicitly that IMO had the mandate from the Kyoto conference to address the issue (Fayette 2001, 204–208). The study was presented in mid-2000 (IMO 2000).

Both organizations originally considered a similar range of measures (including levies and charges, voluntary measures, technical and operational measures, emission standards, and emissions trading), and they have reached similar conclusions on a number of them. The potential of voluntary measures is rather limited in both international aviation and shipping, given that governments lack a stick to move industry beyond "business as usual" (ECON 2003, 26–27, 36; IMO 2000; Bode et al. 2002, 175–176). Realization of technical and operational improvements is further considered and promoted by both ICAO and IMO (ICAO 2004, Appendix H; IMO 2003), but is either expected to occur regardless of further action in the foreseeable future (IPCC 1999) or hinges on provision of appropriate incentives for shipbuilders and shipowners (IMO 2000). Finally, both organizations have in effect dismissed emission standards and *internationally coordinated* levies or charges as impractical or unwarranted (despite continuing proposals for their introduction: e.g., WBGU 2002). The abandonment of emission standards is particularly noteworthy in the case of the IMO, because of the organization's experience with such standards. In particular, it had been considered that GHG emission standards could become part of Annex VI of the IMO-administered MARPOL Convention on air pollution from ships that was elaborated in the 1990s (Fayette 2001) and currently contains standards for emissions of sulfur dioxide and nitrogen oxides (Pisani 2002).

ICAO has been particular in its discouragement of the unilateral introduction of levies by individual countries. An ICAO recommendation on reciprocal tax exemp-

tions for foreign aircraft has become the norm in international air transport by its incorporation into most bilateral air transport agreements between states. While introducing an emission charge might in principle still be possible, it is difficult to design such a charge so that it would not be considered taxation. In addition, ICAO has defined rather restrictive guidelines for emission-related levies. Accordingly, "The funds collected should be applied in the first instance to mitigating the environmental impact of aircraft engine emissions" (addressing specific damage, funding research). Furthermore, such charges should not serve any fiscal aims, should be related to costs, and "should not discriminate against air transport compared with other modes of transport" (ICAO 1996; see also Abeyratne 2001). While this policy is not legally binding on members and leaves some room for interpretation, the ICAO Assembly mandated further work on the issue by 2007 and, in the interim, urged countries to refrain from unilateral action (ICAO 2004, Appendix I).

Despite the similarities mentioned above, ICAO and IMO have headed off in different directions. The ICAO Assembly assigned priority to the development of "open emissions trading for international aviation" by the Council (ICAO 2001, Appendix I). An "open" emissions-trading system could be connected to the emissions-trading system under the Kyoto Protocol and would thus allow aviation to trade emission permits with other sectors. To implement such a system, a cap on emissions from aviation would need to be defined and the resulting amount of emission allowances allocated to the aviation industry. Given the inconclusiveness of many years of discussions on the allocation of emissions from international transport under the UNFCCC, resolving this issue will represent a major challenge for ICAO. The ICAO schedule originally aimed at finalizing related proposals to the UNFCCC by 2003 (Abeyratne 2001). In 2004, however, the ICAO Assembly endorsed the further development of an open emissions-trading system for international aviation and repeated its previous instruction to the ICAO Council "to develop concrete proposals and provide advice as soon as possible to the Conference of the Parties of the UNFCCC" (ICAO 2004, Appendix I).

While it had originally also put emphasis on emission standards and emissions trading (MEPC 2002; UNFCCC 2002; ECON 2003, 12–13), IMO has shifted its focus toward "GHG emission indexing." GHG emission indexing refers to the determination of a set of environmental criteria (emission standards, technological and operational measures) that can be used to give an index to each vessel indicating its GHG emission performance. It can provide a basis for differentiating taxes, port

dues, and charges or insurance rates, but had not received a particular blessing in the aforementioned IMO study of 2000 (IMO 2000, 150–151). GHG emission indexing grants particular flexibility to shipowners/operators, since they can choose between different components of the index for achieving any required improvement. At the end of 2003, the IMO Assembly adopted a resolution on "IMO Policies and Practices Related to the Reduction of Greenhouse Gas Emissions from Ships" that had been prepared by a Correspondence Group established by the MEPC (MEPC 2002; UNFCCC 2002). The resolution in particular mandates the MEPC to develop GHG emission indexing further. The resolution also allows further work on emissions trading by calling for the evaluation of "market-based solutions" (IMO 2003). In 2004, the MEPC further developed a CO_2-indexing scheme and asked members to apply it in a trial period (http://www.imo.org). The work has, however, not resulted in any binding measures yet.

Conclusions and Outlook

ICAO and IMO have started consideration of action on GHG emissions from aviation and maritime transport, but have not gone beyond "symbolic" action yet. More than seven years after the adoption of the Kyoto Protocol, neither of the organizations has agreed on any tangible measures, and it is doubtful whether this situation will change in the foreseeable future. On the one hand, climate change does not belong to their core concerns, contributing further to an already heavy workload, and mitigating emissions from international aviation and shipping may even be considered incompatible with the organizations' main objective of furthering these sectors. On the other hand, the threat of regulatory competition by the climate change regime, the EU, and individual countries has remained rather weak. Furthermore, disagreement over whether any measures would have global coverage or should only apply to industrialized countries has delayed progress.

In the case of IMO, the slow progress is also due to two other factors. First, IMO has perceived sea transport as part of the solution rather than as part of the problem. Shipping is seen as a comparatively environmentally friendly transport mode and its contribution to climate change as "relatively small" (MEPC 2002; see also IMO 2000, 169; UNFCCC 2002). Second, IMO has stressed that placing an additional burden on shipping requires similar measures to be taken with respect to other modes of transport (i.e., aviation). Otherwise, shipping might become uncompetitive, which would lead to a modal shift to less environmentally friendly modes of transport (IMO 2000; UNFCCC 2002).

The lack of coordination between ICAO, IMO, and the climate change regime provides a further indication of the current stalemate. The demand for coordination is apparent not only because there is a need to ensure that international aviation and shipping contribute their fair share to the overall endeavor. A particular demand for coordination exists with respect to an open emissions-trading system envisaged by ICAO because it requires compatibility with the system of emissions trading under the Kyoto Protocol. To date, however, members of the three institutions have responded to this demand for coordination primarily by exchanging information through mutual participation in meetings and reporting on relevant developments and decisions by the respective secretariats. In reality, reports have triggered little substantive debate and have resulted in very limited follow-up. As a result, members of the climate change regime may identify insufficiencies and incompatibilities of any measures only after ICAO and IMO have elaborated them (see in more detail Oberthür 2003, 200–202).

On the basis of the preceding analysis, we can identify in particular three options for enhancing the willingness and ability of ICAO and IMO to take effective action in the future:

1. Since the potential regulatory competition by the climate change regime has already been a significant driving force in the past, continuing work on measures to limit and reduce GHG emissions from international transport within the climate change regime could help keep up the pressure on ICAO and IMO. The entry into force of the Kyoto Protocol in early 2005 may improve this prospect.

2. The implementation of domestic action by individual states could enhance the willingness of aviation and shipping interests as well as state governments to accept effective international regulation. Because the EU is the biggest contributor to bunker-fuel emissions by contributing a good third of reported emissions of this source from industrialized countries, it is less constrained by considerations of competitive disadvantages than others and appears particularly suited to taking such action. Other OECD countries in favor of effective action to address, in particular, GHG emissions from aviation (e.g. Norway, Switzerland, New Zealand) could be expected to get on the EU "bandwagon" by taking equivalent action.

3. Through their deliberation, ICAO and IMO may "learn" that effective action on climate change is compatible with and may even be supportive of their general objectives. Controlling GHG emissions may not appear to be immediately and directly supportive of the orderly development of international shipping and air transport. However, GHG emission control may well increase its legitimacy and

acceptance, and can thus contribute to achieving the core objectives of ICAO and IMO. Public-awareness campaigns about the environmental impacts of international transport may further such a learning process.

Potential for creating synergy between the climate change regime and IMO and ICAO thus exists. Should ICAO and/or IMO fail in their efforts, however, GHG emissions from international transport may have to be addressed by the climate change regime. Even if the targeted organizations took action, measures under the UNFCCC and its Kyoto Protocol could complement such regulation.

Facilitating and Strengthening International Cooperation on Climate Change: The EU Burden-Sharing Agreement

On the basis of an agreement on differentiated targets of the then fifteen EU member states reached in March 1997, the EU constituted the major leader in the Kyoto negotiations. Without this Burden-Sharing Agreement, a similar leadership coalition could not have emerged. Consequently, the Agreement facilitated and strengthened the commitments agreed to in Kyoto (Interaction through Commitment). Subsequently, the Kyoto Protocol prompted the codification of the burden sharing in EU law, which strengthened the Protocol's implementation by subjecting compliance of EU member states with their quantitative emission commitments to the special enforcement powers of the EU.

Strengthening and Facilitating Agreement in Kyoto

The EU member states reached a first Burden-Sharing Agreement about nine months prior to the Kyoto conference in March 1997. It foresaw differentiated targets for the individual member states ranging from +40 percent for Portugal to −30 percent for Luxembourg and amounted to an overall GHG emission reduction of 9.2 percent. The Agreement remained conditional on an acceptable outcome of the international negotiations. It was a consequence of the EU's long-established objective to act jointly in international climate policy, because competence in this area is shared between the EU and its member states (Oberthür and Ott 1999, 141–142). Table 3.2 provides the differentiated targets under the Burden-Sharing Agreement of 1997 together with the figures as adapted to the outcome of the Kyoto negotiations in 1998 and subsequently codified in EU law in 2002.

The Agreement of 1997 committed the EU member states to a common position and thus established the EU as a powerful leading coalition favoring stringent emis-

Table 3.2
The EU Burden-Sharing Agreements of 1997 and 1998/2002

Member state	1997: emission reduction by 2010	1998/2002: emission reduction by 2008–2012
Luxembourg	−30%	−28%
Denmark	−25%	−21%
Germany	−25%	−21%
Austria	−25%	−13%
United Kingdom	−10%	−12.5%
Belgium	−10%	−7.5%
Netherlands	−10%	−6%
Italy	−7%	−6.5%
Finland	0%	0%
France	0%	0%
Sweden	+5%	+4%
Ireland	+15%	+13%
Spain	+17%	+15%
Greece	+30%	+25%
Portugal	+40%	+27%
EU-Total	**–9.2%**	**–8%**

Note: While targets of 1997 relate to CO_2, CH_4 and N_2O, targets of 1998/2002 relate to all GHGs regulated under the Kyoto Protocol.

sion reductions in the negotiations on the Kyoto Protocol (figure 3.2). It took the form of Council conclusions that do not bind member states legally but entail a strong political commitment. The differentiated targets of EU member states under the Agreement of 1997 are indicative of the range of positions of individual member states. However, several EU member states had to make concessions so that the Agreement went significantly beyond the original aggregate of the positions of individual EU member states (e.g., Ringius 1999). In the absence of the Burden-Sharing Agreement, member states would thus have pursued widely diverging interests (table 3.2), with some of them probably favoring even less stringent targets. Overall, the Agreement created an otherwise unlikely coalition of fifteen industrialized countries in the Kyoto negotiations.

First of all, acting as a united coalition, the EU facilitated reaching agreement in Kyoto by reducing the number of negotiating parties. The trilateral negotiations between the United States (with an emission share of 36.1 percent), Japan (8.5

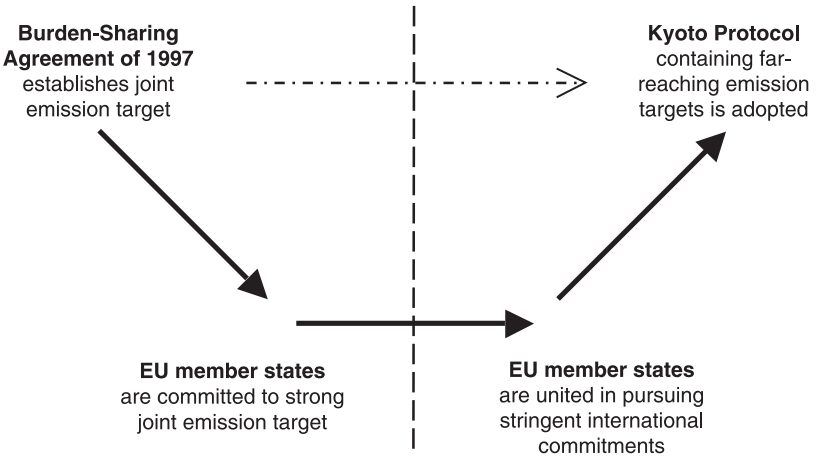

Figure 3.2
EU Burden-Sharing Agreement facilitates and strengthens Kyoto Protocol

percent), and the EU (24.2 percent) in Kyoto covered more than 68 percent of industrialized countries' CO_2 emissions in 1990. Reaching a similar coverage without the EU acting in unity would have meant increasing the number of negotiating parties at least to eight (United States, Japan, Germany, United Kingdom, Canada, Italy, Poland, France)[2] or, alternatively, seventeen (if all EU member states had been involved separately). Such an increase would have placed a considerable burden on the negotiations and would have increased the likelihood of failure, because it is "almost axiomatic that the more parties (and issues), the higher the costs, the longer the time, and the greater the informational requirements for a negotiated settlement" (Sebenius 1983, 308–309). It would have added to an already very high complexity and great time pressure (on the negotiations in Kyoto, see Oberthür and Ott 1999, chap. 7). In addition, it would have been difficult to establish which countries were to participate in the core negotiations without the EU acting in a unitary fashion, since there is no clear line between countries such as France (2.7 percent), the United Kingdom (4.3 percent), Canada (3.3 percent), and Italy (3.1 percent) (emission shares according to the Appendix of the Kyoto Protocol).

The EU acting in unity was also instrumental in achieving concessions from Japan and the United States and thus in strengthening the targets agreed on in Kyoto. In the political bargaining process with the United States and Japan—which was complemented by pledges of other industrialized countries—the EU, based on its

Burden-Sharing Agreement, supported the deepest GHG emission cut of 15 percent. In the absence of a common EU position, stringent targets would have received far less international support because only some member states would have supported them. The United States (stabilization) and Japan (small reduction) would have found it much easier to defend their positions because they would have been neatly in the middle of other countries. Accordingly, Australia, which demanded a growth target for itself, unsuccessfully tried to establish the differentiated targets of EU member states as the reference point in the international negotiations by proposing that industrialized countries' targets should be within a range of −30 percent to +40 percent (Oberthür and Ott 1999, 144). But compared with the common position of the EU, the other major players came under pressure. They eventually accepted targets close to the EU's (EU: −8 percent; United States: −7 percent; Japan: −6 percent) (on the negotiations see Oberthür and Ott 1999, chaps. 4–7). Accordingly, there is broad agreement in the literature that without the EU, the commitments by the United States and Japan would have been lower.

The Revision of the Burden-Sharing Agreement: Supporting Effective Climate Protection

The first interaction between the EU Burden-Sharing Agreement and the Kyoto Protocol resulted in two follow-up cases. First, the Kyoto Protocol triggered the revision of the Burden-Sharing Agreement and its codification in supranational EU law (Interaction through Commitment). Second, as a result of this codification, the supranational enforcement mechanisms of the Union provide a particular incentive to EU member states to comply with their Kyoto targets and thus support the effective implementation of the Protocol (Behavioral Interaction).

While there was no time in Kyoto to fix targets for each EU member state, Article 4 of the Kyoto Protocol allowed any group of countries to fulfill their commitments under the Protocol jointly and, to this end, to redistribute their emission allowances among them.[3] After notification of the secretariat at the time of ratification, the redistribution cannot be further modified. EU member states had an obvious interest in using Article 4, which had been included at the EU's request. Given the internal differences in starting points and positions, the then fifteen EU member states and the EU itself could only become parties to the Kyoto Protocol if they redistributed their common target of −8 percent under Article 4. It is worth highlighting that, by means of Article 4, the Kyoto Protocol in fact delegated the task of fixing targets for individual EU member states to the EU itself. The Kyoto Protocol thus indirectly

made use of the comparatively sophisticated framework of decision making of the EU to reach binding agreement between member states, which is the daily bread of the Union. As a result, the international negotiations were relieved of the burden of establishing targets for fifteen states.

EU member states agreed on a revised Burden-Sharing Agreement in mid-1998 and codified it under supranational EU law in 2002. The Agreement of 1997 needed adaptation in light of the outcome of the Kyoto negotiations. While the 1997 Agreement had been related to three GHGs (CO_2, CH_4, N_2O), the Kyoto targets also included fluorinated GHGs. The Kyoto Protocol established a commitment period of 2008–2012, whereas the 1997 Agreement referred to 2010 as a single target year. Finally, the latter amounted to overall reductions of 9.2 percent, while the common EU target under the Kyoto Protocol was −8 percent. Targets of individual member states under the revised Burden-Sharing Agreement range from +27 percent for Portugal to −28 percent for Luxembourg (table 3.2). The 1998 Agreement became legally binding in spring 2002 as part of the Council Decision to ratify the Kyoto Protocol (European Union 2002). The UNFCCC Secretariat was notified on ratification of the Protocol on May 31, 2002.

The codification of the Burden-Sharing Agreement in supranational law has created an additional incentive for EU member states to comply with their commitments under the Protocol and thus supports climate protection. It hardened the international commitments of EU member states to limit and reduce GHG emissions. By means of the Council Decision, the Agreement became part of the supranational law of the EU and is thus subject to the supranational adjudication and enforcement mechanisms of the Union. In particular, the European Commission will monitor EU member states' compliance with their targets and may initiate infringement proceedings, if required. As a result, noncompliant member states may be brought before the European Court of Justice (ECJ), which issues binding rulings and may even authorize financial penalties to be imposed by the Commission. While a similar enforcement mechanism does not exist for any other party to the Kyoto Protocol, it provides a powerful additional incentive for EU member states to comply with their Kyoto targets and thus enhances climate protection.

Conclusions

Reflecting climate change's manifold causes and consequences, the international regime on climate change influences and is influenced by a great number of other

international institutions and EU legal instruments. A considerable potential exists for further interactions that may materialize in the future. Institutional interactions of the climate change regime cover all three major causal mechanisms. On some occasions, they have resulted in synergy, while leading to tensions on others, in particular if involving institutions from other policy fields. In many cases, there is potential for creating or enhancing synergy.

The horizontal interaction with ICAO and IMO followed the causal mechanism of Interaction through Commitment and exemplifies the at times problematic relationship between the climate change regime and economic institutions. The Kyoto Protocol's request to ICAO and IMO committed the members of the climate change regime (in particular industrialized countries) to addressing GHG emissions from international transport. The request created pressure on both organizations and empowered the proponents of action on GHG emissions among their members because it carried the implicit threat of regulatory action under the climate change regime, if ICAO and IMO failed to take action. In response, both organizations have begun to address the issue. However, coordination between them and with the climate change regime has barely occurred yet. Furthermore, the objectives of ICAO and IMO to enhance international air and sea transport hardly led them to advance their efforts of their own accord. In addition, the threat of regulatory competition by the climate change regime and individual actors has remained weak. As a result, neither of the organizations has gone beyond "symbolic" action, and little progress in addressing GHG emissions from international transport has been achieved to date. Under the circumstances, the future success of the interaction is also in doubt. Progress may in particular be driven by (1) a strengthened threat of regulatory action within the climate change regime, (2) domestic action by the EU and other countries, and (3) a learning process within ICAO and IMO. In any event, the request of the Kyoto Protocol begs the question of which of the institutions involved will regulate GHG emissions from international aviation and shipping (and to what extent).

The vertical interaction with the EU Burden-Sharing Agreements of 1997 and 1998/2002 demonstrates the potential of the EU to promote the development and implementation of international institutions. The Agreement of 1997 triggered a case of Interaction through Commitment, facilitating and strengthening agreement on the Kyoto Protocol. By committing EU member states to a stringent joint target, the Agreement united the EU to form a leadership coalition pushing for strong emission limitation and reduction targets in the Protocol negotiations. This coalition even included EU member states that would not have requested strong commitments

on their own. As a result, the EU was able to secure more stringent commitments from its negotiating partners in Kyoto than would otherwise have been the case. Furthermore, getting to agreement in Kyoto was significantly facilitated primarily because the number of core negotiating partners was reduced to three.

As a follow-up, the Kyoto Protocol in effect delegated to the EU itself the distribution of the EU target to individual member states. The international process was thus relieved of this task and the advanced decision-making capacity of the EU employed to this end. The resulting Burden-Sharing Agreement of 1998/2002 in turn supported the implementation of the Protocol by subjecting EU member states to the particular enforcement powers of the European Union. In case of noncompliance, EU member states may face financial penalties authorized and enforced by the European Court of Justice. In this way, the Burden-Sharing Agreement significantly hardens the quantitative emission commitments for EU member states. This finding contrasts starkly with persistent allegations by other OECD countries and the United States in particular that the allowance to fulfill their commitments jointly represents an unjustified preferential treatment of EU member states (Oberthür and Ott 1999, chap. 12).

Under certain circumstances, the EU can thus help advance international negotiations decisively and can strengthen the implementation of international commitments. EU member states could credibly commit to the targets of the Burden-Sharing Agreement because the supranational structure of the EU facilitates concluding binding agreements (which is the daily bread of EU policymaking). The EU provides a forum for twenty-five countries at present to coordinate their position and to share and implement their international commitments by employing the supranational powers of the EU. It may also be possible to take advantage of the particularly high "problem-solving capacity" of the EU more frequently in other contexts in which it can be left to the EU to share/implement a joint international commitment.

Notes

1. Legally, the European Community (EC), not the EU, is a party to both the UNFCCC and the Kyoto Protocol, in addition to the member states. I nevertheless refer to the EU throughout this chapter for ease of reference.

2. Based on the assumption that Russia would also not have participated under these circumstances; for the percentage figures see the Appendix of the Kyoto Protocol.

3. While the Agreement facilitated the negotiations on targets, the issue of how to design the resulting Article 4 of the Kyoto Protocol placed an additional burden on negotiators; see Oberthür and Ott 1999, chap. 12.

References

Abeyratne, Ruwantissa. 2001. ICAO: Some Recent Developments in Aviation and Environmental Protection Regulation. *Environmental Policy and Law* 32 (1): 32–40.

Bail, Christoph, Simon Marr, and Sebastian Oberthür. 2003. Klimaschutz und Recht. In Hans-Werner Rengeling, ed., *Handbuch zum europäischen und deutschen Umweltrecht*, vol. 2, 254–304. Cologne: Carl Heymanns.

Bodansky, Daniel. 1993. The United Nations Framework Convention on Climate Change: A Commentary. *Yale Journal of International Law* 18 (2): 451–558.

Bode, Sven, Jürgen Isensee, Karsten Krause, and Axel Michaelowa. 2002. Climate Policy: Analysis of Ecological, Technical and Economic Implications for International Maritime Transport. *International Journal of Maritime Economics* 4 (2): 164–184.

Buergenthal, Thomas. 1969. *Law-Making in the International Civil Aviation Organization*. New York: Syracuse University Press.

Chambers, W. Bradnee. 1998. International Trade Law and the Kyoto Protocol. In W. Bradnee Chambers, ed., *Global Climate Governance: Inter-Linkages between the Kyoto Protocol and Other Multilateral Regimes*, 39–58. Tokyo: United Nations University, Institute of Advanced Studies.

Chambers, W. Bradnee, ed. 2001. *Inter-Linkages: The Kyoto Protocol and the International Trade and Investment Regimes*. Tokyo: United Nations University Press.

Charnovitz, Steve. 2003. *Trade and Climate: Potential Conflict and Synergies*. Washington, DC: Pew Center on Global Climate Change.

Council of the European Union. 2001. *Climate Change: Preparation of COP 7 in Marrakesh from 29 October to 9 November 2001*. Council Conclusions. Available at http://register.consilium.eu.int/pdf/en/01/st13/13439en1.pdf.

Crayston, John. 1993, January–June. Civil Aviation and the Environment. *UNEP Industry and Environment*: 51–53.

Crayston, John, and Jane Hupe. 2000, October–December. Civil Aviation and the Environment. *UNEP Industry and Environment*: 30–32.

Diederiks-Verschoor, Isabella H. P. 1993. *An Introduction to Air Law*. Deventer: Kluwer Law and Taxation.

ECON. 2003, January. *GHG Emissions from International Shipping and Aviation*. Report 01/03. Oslo: ECON Centre for Economic Analysis.

European Commission. 1999, December 1. *Air Transport and the Environment: Towards Meeting the Challenges of Sustainable Development*. Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee, and the Committee of the Regions. Doc. COM (1999) 640 final. Brussels: European Commission.

European Union. 2002. Council Decision 2002/358/EC of 25 April 2002 Concerning the Approval, on Behalf of the European Community, of the Kyoto Protocol to the United Nations Framework Convention on Climate Change and the Joint Fulfilment of Commitments thereunder. *Official Journal of the European Communities* L 130/1, 15 May 2002.

Fayette, Louise de La. 2001. The Marine Environment Protection Committee: The Conjunction of the Law of the Sea and International Environmental Law. *International Journal of Marine and Coastal Law* 16 (2): 155–238.

ICAO. 1996, December 9. Council Resolution on Environmental Charges and Taxes. Resolution adopted by the Council at the 16th Meeting of its 149th session.

ICAO. 1998. Resolution A32-8: Consolidated Statement of Continuing ICAO Policies and Practices Related to Environmental Protection. Resolutions adopted at the 32nd session of the Assembly, Provisional Edition.

ICAO. 2001. Resolution A33-7: Consolidated Statement of Continuing Policies and Practices Related to Environmental Protection. Resolutions adopted at the 33rd session of the Assembly, Provisional Edition.

ICAO. 2004. Resolution A35-5: Consolidated Statement of Continuing ICAO Policies and Practices Related to Environmental Protection. Resolutions adopted at the 35th session of the Assembly, Provisional Edition.

IMO. 2000, March 31. *Study of Greenhouse Gas Emissions from Ships*. Issue no. 1. London: International Maritime Organization.

IMO. 2003. Resolution A.963(23) adopted on December 5, 2003: IMO Policies and Practices Related to the Reduction of Greenhouse Gas Emissions from Ships. IMO Doc. A 23/Res.963, March 4, 2004. London: International Maritime Organization.

IPCC. 1999. *Aviation and the Global Atmosphere: A Special Report of IPCC Working Groups I and III*. Cambridge: Cambridge University Press.

IPPC. 2001a. *Climate Change 2001: Impacts, Adaptation, and Vulnerability*. A Report of Working Group II of the Intergovernmental Panel on Climate Change. Geneva: Intergovernmental Panel on Climate Change.

IPCC. 2001b. *Climate Change 2001: The Scientific Basis*. Cambridge: Intergovernmental Panel on Climate Change.

Jacquemont, Frédéric, and Alejandro Caparrós. 2002. The Convention on Biological Diversity and the Climate Change Convention 10 Years After Rio: Towards a Synergy of the Two Regimes? *Review of European Community and International Environmental Law* 11 (2): 139–180.

MEPC. 2002. MEPC, 47th session, March 4–8, 2002. Marine Environmental Protection Committee. Available at http://www.imo.org/Newsroom/mainframe.asp?topic_id=109&doc_id=175.

Oberthür, Sebastian. 2001. Linkages between the Montreal and Kyoto Protocols: Enhancing Synergies between Protecting the Ozone Layer and the Global Climate. *International Environmental Agreements: Politics, Law and Economics* 1 (3): 357–377.

Oberthür, Sebastian. 2003. Institutional Interaction to Address Greenhouse Gas Emissions from International Transport: ICAO, IMO and the Kyoto Protocol. *Climate Policy* 3 (3): 191–205.

Oberthür, Sebastian, and Hermann E. Ott (in collaboration with Richard G. Tarasofsky). 1999. *The Kyoto Protocol: International Climate Policy for the 21st Century*. Berlin: Springer.

Pisani, Christian. 2002. Fair at Sea: The Design of a Future Legal Instrument on Marine Bunker Fuels Emissions within the Climate Change Regime. *Ocean Development and International Law* 33 (1): 57–76.

Pontecorvo, Concetta Maria. 1999. Interdependence between Global Environmental Regimes: The Kyoto Protocol on Climate Change and Forest Protection. *Zeitschrift für ausländisches öffentliches Recht und Völkerrecht* 59 (3): 709–749.

Ringius, Lasse. 1999. Differentiation, Leaders, and Fairness: Negotiating Climate Commitments in the European Community. *International Negotiation* 4 (2): 133–166.

Sebenius, James K. 1983. Adding and Subtracting Issues and Parties. *International Organization* 37 (1): 281–316.

UNFCCC. 2002. Subsidiary Body for Scientific and Technological Advice. *Emissions Resulting from Fuel Used for International Transportation: Activities of IMO on Prevention of Air Pollution from Ships; Information by the IMO Secretariat*. Sixteenth session, Bonn, June 3–14 (on file with author).

WBGU. 2002. *Entgelte für die Nutzung globaler Gemeinschaftsgüter*. Politikpapier 2. Berlin: Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen.

Yamin, Farhana, and Joanna Depledge. 2004. *The International Climate Change Regime: A Guide to Rules, Institutions and Procedures*. Cambridge: Cambridge University Press.