HOME THOUGHTS ABOUT ABROAD. BRITISH BUSINESS PERCEPTIONS OF NATIONAL AND INTERNATIONAL ENVIRONMENTAL REGIMES: THE CASE OF STRATOSPHERIC OZONE DEPLETION

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ABSTRACT

Stratospheric ozone depletion is a facet of global environmental change which has received increased attention in recent years. Central to the political response is the Montreal Protocol, an international agreement to phase-out ozone depleting substances. Analysis of the negotiation of the Protocol has identified the influence of major chemical producers on the stance of particular states. However, while there has been analysis of the development of regulation of ozone depleting substances at the macro-scale of international politics, less attention has been paid to its impact on user industries and the position of business managers effectively charged with the implementation of grassroots changes. The paper focuses on British managers' attitudes in selected user industries. Consideration is given to the potential for perceptions of differentials in the design and implementation of measures within individual national regimes in Europe and North America. In some instances such perceived differences are seen to impact on the competitive position of British business. The paper concludes with a more general consideration of the implications of experiences of the implementation of the Montreal Protocol for future initiatives in environmental regulation. It is important to involve the broad mass of businesses, not directly in international negotiations but in subsequent information systems designed both to disseminate good practice and to dispel unfounded perceptions of inequality.

Stratospheric ozone depletion: international efforts to meet a global problem

Pressure is increasing on business to comply with a growing body of environmental regulation and indeed to take proactive measures to include environmental considerations in their future strategy (Smith 1993; Welford & Gouldson 1993). In part such initiatives reflect strengthening perceptions of the *global* environmental impacts of human activity, and the magnitude of the potential effects of environmental change on human futures (Stern et al 1992). Concern about the modification of the chemical composition of the atmosphere has been central to debate regarding global environmental change, with particular attention being devoted to the depletion of the stratospheric ozone layer and the climatic consequences of an enhanced greenhouse effect. Attention here will focus on the former issue, although it should be acknowledged that many of the chemicals identified as ozone depleting, and indeed some of the substitutes developed as 'ozone-friendly' alternatives, also have a global warming potential.

Concerns about the depletion of stratospheric ozone and the effects of increasing terrestrial levels of UV-B radiation on human health and the condition of other animals and plants have become widespread in recent years, gaining currency with politicians and the wider public as well as scientists and environmentalists. Debate about the causes of depletion and initiatives to reduce emissions of ozone depleting substances have, however, had a particularly direct and immediate impact upon businesses involved in the production and use of the main chemicals concerned - chiefly chlorofluorocarbons (CFCs) and halons. Often it is these businesses which effectively have been charged with the search for - largely technocentric - solutions to this environmental problem. For some outside the commercial sphere this appears perverse given the responsibility they attribute to businesses in creating the present environmental crisis; for others it is a logical extension of their faith in free market enterprise to develop innovative means of meeting human needs. Equally, within business, some managers see a heightened environmental consciousness and regulation as creating new and

profitable opportunities, while others perceive environmentalism as threatening company viability (cf Azzone & Bertelè 1994; Buck 1992; Walley & Whitehead 1994).

It is aspects of this potential for divergence in business opinion regarding environmental issues and regulation that form the main themes of the present paper. Environmental pressures do not affect individual businesses as isolated entities, their impact is often judged for its effects on a business relative to others, including its direct competitors. Thus exploration of managers' attitudes towards environmental regulation must attend to their perceptions of the actions of others. This includes businesses, both at home and overseas, but also foreign political jurisdictions whose particular interpretation of the global impetus for control over ozone depleting substances may affect commercial conditions within, and sometimes beyond, their own national markets. Attention here is focused on British managers' perceptions of their own position relative to counterparts in western Europe and North America. Emphasis is placed upon the geographical dimension, although this is not to deny the importance of inter-sectoral variation (cf Vaughan & Mickle 1993). The discussion is thus not so much analysis of the creation of regulatory policy - although attention is paid to the apparent impact of some businesses on its development - but on the rather less studied, yet vital, circumstances of the implementation of policy. How policies are perceived, particularly with regard to equity and efficacy, by those affected and the manner in which others are seen to be reacting to regulation may both have a significant impact on the effectiveness of environmental initiatives and the extent to which relationships between industry and regulators are co-operative or combative. While such issues have received attention at the macro-scale of international politics and through the calculation of national schedules of costs and benefits, little note has been taken of the perceptions of business managers that may affect willingness and ability to change at the grassroots (cf Morrisette et al 1991; Skjærseth 1992).

Restrictions on the use of CFCs in particular applications have been enforced, chiefly in North

America and Scandinavia, since the late 1970s (Roan 1989). However, the late 1980s and 1990s have seen accelerating initiatives to phase-out the use of ozone depleting substances in products such as fire extinguishers, refrigerators and air conditioning systems, and the process of manufacture of goods as diverse as blown foams and electronic circuit boards. This follows hardening scientific concern regarding the extent of stratospheric ozone depletion and its terrestrial effects. But, crucially, it also reflects the effective translation of concern into politically-driven regulatory regimes at national and international levels (Haas 1991). Of central importance is the Montreal Protocol of 1987 which established an internationally agreed timetable for the phase-out of the most potent ozone depleters and a mechanism - so far utilised in 1990 and 1992 - for increasing the stringency of controls.

International effort to curb ozone depletion has progressed beyond its initial preoccupation with defining a regulatory framework and is now engaged with the "numerous difficulties" of implementing the Protocol. Attention is focused on the practicalities of transition to less environmentally damaging products and processes, minimising emissions from equipment still using ozone depleting substances, schemes for recovering and recycling such chemicals and curbing attempts, including black market trade, to evade Protocol provisions (Parson & Greene 1995). Such issues highlight aspects of the interactions between global concerns and initiatives - be they environmental, scientific, diplomatic or political - and the more specific or localised decision-making that determines the extent to which environmentally damaging processes are perpetuated or abated. Crucial also is the interaction between the arenas of politics and of business.

Governments, business and regulation: producers and consumers of ozone depleters

The political construction of the international regulatory system is now well documented (Benedick 1991; Haas 1991; Jachtenfuchs 1990; Parson 1992; Parson & Greene 1995). Such analysis includes attention to the role of business - principally the major chemical companies which produced CFCs and

halons - as a stakeholder involved in negotiations with scientists, environmentalists and government representatives (Morrisette et al 1991). It is argued that the attitudes of key corporations helped shape different national stances on regulatory policy prior to 1987 and in negotiations to establish the Montreal Protocol. The initial reluctance of Britain and France to countenance significant reductions in the consumption of ozone depleting substances has been linked to the influence of ICI and Atochem, respectively. By contrast, the more progressive policies of the United States, particularly during the mid 1980s, have been associated with assurances from their leading producer, Du Pont, regarding the technical and commercial viability of alternatives to CFCs (Benedick 1991; Haas 1991; Jachtenfuchs 1990). Relationships between government and business cannot, however, comprise a complete explanation of differing governmental attitudes to the regulation of ozone depleting substances. In all the instances noted - and perhaps to a greater extent in West Germany which was Europe's largest CFC producer in the mid 1980s - government's perceptions of their political self-interest, in a context of increasing scientific and environmental concern, led them to propose regulatory measures in advance of the producer industries' immediate abilities to respond (Benedick 1991; Brenton 1994; Parson 1992). Indeed Haas (1991) has invoked the concept of an epistemic community of specialists, particularly atmospheric scientists, whose common acceptance of environmental risk from substances identified as ozone depleters was a critical force behind US political policy and, by extension, the development of international regulation.

While major chemical producers are argued to have had an influence over political discussion of the phase-out of ozone depleting chemicals, attention to user industries has been restricted. This is despite a total investment in products and equipment reliant on CFCs and halons that far outweighs the financial interests of the chemical companies in their production. Some states did take account of the needs of significant user industries in formulating their position in international negotiations. Thus, Japan's initial caution regarding regulation seemingly reflected the interests of the electronics industry, then a major consumer of CFC-113 (ENDS 1987). However, it is claimed that user industries "played

virtually no part in the negotiation" leading to the Montreal Protocol (Brenton 1994). Moreover, subsequent coverage of the implementation of controls by businesses themselves has been limited. User industries are often thus portrayed less as players in the international political and economic game behind the creation of regulatory systems, and more as responding to such frameworks once established. This is not to suggest, however, that user industries are passive respondents; some have seen new business opportunities in the changing environmental and regulatory climate.

The apparent economic and political influence of a handful of major chemical corporations is in part a product of their scale - reflected in an international sphere of operations and in the resources committed to research and development and to public relations activity - and the close relationship which often develops in consequence with the government of their home state (Grant et al 1988). By contrast, users are a much more diverse group found in several industrial sectors. Individual companies are both more numerous and generally much smaller than the chemical giants (Parson 1992).

Hitherto, attention to the actions and perceptions of user industries has usually fallen into one of two categories. Firstly, there are reports praising initiatives taken by particular companies, often either larger corporations or smaller specialist producers with a particular environmental remit, to reduce their dependence on ozone depleting substances (eg ENDS 1990, 1992a). While such developments take place in a fiercely competitive commercial environment, there is also co-operation between companies in sectors including electronics and pharmaceuticals to spread the costs and risks of developing and testing new products and processes. Secondly, wider surveys of environmental practice by business have criticised the generality of firms in sectors including refrigeration and users of chlorinated solvents for their limited progress in pursuing alternatives to ozone depleting chemicals (eg Department of Trade and Industry 1990; ENDS 1992b). Some such surveys offer a perspective on the attitudes of medium-sized and smaller companies, often regarded as less likely to undertake significant environmental initiatives (Brenton 1994; Peattie & Ringler 1994), but cannot record the individual

voices of such companies.

Talking to users: environmental regulation and business competition

It seems worthwhile therefore to consider the views of individual managers within selected user industries interviewed as part of a wider analysis of British business attitudes towards the issue of stratospheric ozone depletion. A fuller outline of this study is given in Purvis et al (1995). Here attention will be concentrated on the responses of managers within user companies identified on Table One. Most were medium-sized operations, a scale which was felt by some to be particularly vulnerable to environmental regulation, being large enough to be visible and thus penalised for transgression of regulations and yet too small to influence political and environmental agendas at a national or international level.

Extensive interviews allow examination of managers' perceptions of interactions between the operation of their particular plant or business and the wider issues raised by stratospheric ozone depletion. As might be expected much of our interviewees' attention was devoted not to the impact of industry on environment, but the effects of environmental regulation upon the competitive position of business. From such a perspective the international context of regulation raised concerns regarding perceived differentials in design and implementation of measures within individual national economic and political systems.

Our interviewees appeared to accept the necessity for regulation of substances with a high ozone depletion potential. The adoption of the provisions of the Montreal Protocol by the European Community excited little comment, although there were specific concerns that tightening regulation had created a timetable for the phase-out of CFCs in a number of 'essential' uses, principally medical aerosols, which could not be met (Purvis et al 1995). However, the implementation of the controls in

Table One: Companies and interviewees quoted in the present paper

Company	Major relevant activity	Designation of interviewee
3	Pharmaceuticals producer	CFC product manager
5	Commercial refrigeration equipment producer	Production Manager
6	Supermarket chain	Head of Refrigeration
8	Dry cleaners	Group Technical Director
10	Foam blowers	Managing Director & Technical Director (2 interviewees)
11	Blown foam moulders	Quality Engineer
12	Anti-corrosion engineers	Marketing Managing Director

practice and their impact on the commercial standing of British companies at home and abroad was more widely discussed. Several interviewees offered strongly expressed, if not always fully developed, analyses of the impact of environmental regulation and national differences in environmental attitudes on their commercial position in European and North American markets. Some clearly felt that environmental regulation in general, and specific measures covering ozone depleting substances, created new inequalities in international trade.

This could be related to the distinction drawn more widely between business perceptions of environmental regulation as an economic threat or an opportunity. This is to acknowledge not only the direct impact of regulation on a company itself, but also the extent to which there is a differential impact on competitors, especially abroad, who may be subject to regulation which is different in extent, form and degree of enforcement. Our interviewees discussed the position of countries where regulations were seen as more stringent than Britain and those considered less motivated by environmental considerations. It was, however, the former category which attracted some of the strongest and most diverse opinions.

Different shades of green

Germany, Denmark and other Scandinavian states were noted as countries whose strong regulation of ozone depleting substances impacted on British business. One interviewee noted that "Germany pushes standards and it's important to be able to live with Scandinavian and German standards" (Interview 12). This is consistent with the 'green' reputation of these states which another interviewee attributed to their "homogeneous, well-educated, environmentally- and socially-conscious population" (Interview 3) (cf academic ideas about environmental consciousness reviewed in Martell 1994). The environmental attitudes of German and Scandinavian businesses, consumers and politicians are frequently seen as significantly in advance of counterparts in Britain and France (ENDS 1989a, 1989b,

1989c; Richardson & Rootes 1995; Touche Ross 1990; Vaughan & Mickle 1993). Moreover, Germany, in particular, is widely perceived as driving recent increases in the scope and stringency of EC environment policy.

On issues associated with stratospheric ozone depletion these same states have a history of innovation. Germany and Denmark, sometimes accompanied by Belgium and the Netherlands, have pressed for tighter EC regulations than other member states, often including Britain, were prepared to countenance. Indeed Germany and Denmark have publicly criticised the limitations of Community policy and unilaterally adopted more stringent curbs on CFCs, halons and, subsequently, HCFCs (Jachtenfuchs 1990; ENDS 1988, 1993d). Furthermore, German and Scandinavian businesses have led the adoption of substitutes for CFCs in fields including refrigeration and automobile air-conditioning (ENDS 1991, 1993a, 1993b, 1993c, 1994).

France, by contrast, has been portrayed as displaying a more limited green consciousness than Britain. It is also seen as a laggard in the development of EC policy on ozone depleting substances, perhaps reflecting governmental adherence to the advice of a national chemical industry reluctant to surrender a lucrative trade in CFCs (Benedick 1991). Thus the distinction drawn by one interviewee between the attitudes of British and French supermarkets towards the potential use of non-CFC refrigeration systems seems unremarkable:

> I went to see one of the French gas producers who ... said "well, there's nobody really carried away with it in France."... [T]he French supermarkets just don't think it's going to happen. Apathy. Now that doesn't apply in England (Interview 6).

The same might not, however, be said of observations regarding environmentalism and regulation in the United States. The US has been portrayed as shaping debate in the interacting arenas of science and politics that led to international regulation of ozone depleting substances, by contrast with the initial ambivalence of other Western states to effective controls (Benedick 1991; Haas 1991; Skjærseth

1992). Moreover, Du Pont is often cited as leading the scientific and commercial effort to a total phase-out of CFCs and the development of more environmentally benign chemical alternatives (Birchard 1993). Federal legislation backs up a stringent timetable for the phase-out of ozone depleting substances with a fiscal incentive to adopt less damaging alternatives (Parson & Greene 1995). Moreover, individual states and even city jurisdictions have prohibited the use of CFCs (Roan 1989, Kux 1995). However, some of our interviewees cited the potential for diversity of regulatory systems, and indeed environmental attitudes, within such a large federal system to support their perception of a lesser development of environmental awareness in the US than Europe:

> they're actually a long way behind us. Technically and ... particularly in implementation. What happens out in the sticks in the States is totally different to what happens in New York or Miami. What is driving ... things ... [is] what happens in the large cities ... but outside of those they are still very backward on health and safety (Interview 12).

Few interviewees agreed with the suggestion that American businesses in general had responded more rapidly and effectively than their British counterparts to the initial concerns raised about ozone depletion from the mid 1970s onwards. Moreover, their interpretation of recent US attitudes suggests that concerns raised elsewhere about a political backlash against controls on ozone depleting substances (Parson & Greene 1995) may also apply within the business community. Reflecting on a recent trip to the US one interviewee from a foam blowing company noted

> There's legislation in terms of taxation on the use [of CFCs] but I think the acceptance of CFCs as a hazardous or an environmentally unfriendly product is less in the USA than here. Certainly amongst manufacturing people we've met.... [T]here's a certain cynicism amongst the Americans now about CFCs, they've moved on to other things and that's yesterday's issue.... The guys over there last week were saying ... "the issue is a load of bull. Its been blown out of all proportion ... we still don't really believe that CFCs are as bad as they're labelled" (Interview 10).

Green business or sharp practice?

Interviewees varied in their interpretation of the implications for their own businesses of perceived national differences in attitudes and regulatory systems concerning ozone depletion. For some the strength of environmental regulation and commercial innovation in countries such as Germany have rendered them giant experiments in green business which British companies can usefully observe. Thus an interviewee from a chain of dry-cleaners noted that

> I go to Germany regularly to see what is happening there and to learn from ...[it] and take what I think ... are the best bits and institute them here.... [I see] some aspects of their regulatory approach which I think are unnecessary and impose onerous costs to no useful purpose and those we would tend to disregard. But there is a marvellous opportunity for us to learn and institute good practice (Interview 8).

It is perhaps no coincidence that this attitude was most strongly expressed within an industry where international trade and competition are largely absent. Other interviewees facing what they saw as the threat of unfair competition in both domestic and export markets were far less sanguine about the impact of environmental regulation and perceived differentials in the standards of implementation between member states of the EU. An interviewee from a producer of commercial refrigerators facing a loss of trade attributed to cheap imports considered his company to be affected by double standards. A contrast was drawn between the selling power associated with popular perceptions of the green credentials of German and Danish producers and what our interviewee saw as the actual practice of the subsidised importation of machines which were produced to lower environmental standards than would be marketable in their country of origin:

> in reality Denmark, places like Germany ... shove all their shit into this country and we allow it to come in. And we have to compete with that.... [I]f we're going to have this free market and we're going to have this competition, let's put it all on an even base .... But companies like ... [rival company name] who are enormous in Denmark ... come over here and they sell

> cabinets that are not totally CFC free. But they sell somewhere in the region of six to eight million quids' worth a year.... [W]ith them they don't have to make a profit in this country. They are supported by their own business back in Denmark. The view is taken that we don't want to make a profit, we just want to recover our overheads.... [B]ack home they've got a different outlook, a different strategy, a different policy, than ... the way they treat the UK market (Interview 5).

There were also perceptions that inequalities between Britain and some continental competitors are exacerbated by the lesser commitment of the British government to support industry. Our previous interviewee acknowledged the strength of the overall environmental record and the competitive position of German industry, "but they do get a lot of support." (Interview 5). Yet in Britain

> the government themselves don't really seem to be bothered.... [T]hey seem to talk a lot ... but when it gets down to it ... there doesn't seem to be any cash incentive.... [C]ompared to other countries where ... governments do subsidise ... bringing new machinery in and stuff like that, I think our country's lagging well behind (Interview 11).

There were also perceptions that environmental regulation was sometimes used to protect home markets against British imports. One interviewee raised the general point that

> What the Germans do, and the French do it in a different way, ... but what tends to happen is that they make the legislation, as all countries make legislation, such that it suits the home market and if you do that ... with sufficient dexterity then you can preclude other game players getting perfectly good products into the market place. Certainly we've had that happen to us in a small way (Interview 12).

Another questioned elements of German environmentalism

> I think Germany in particular has quite a lot of legislation that dictates environmental issues. But I think the Germans are also pretty good at protectionism as well. So I think there's an element of both there (Interview 10).

However, none of our interviewees were specific in providing particular instances to substantiate this perceived inequity and in some cases criticism of the differential application of environmental standards was couched in the generalised language of established prejudices against 'bloody-minded foreigners' rather than revealing any particular insights into environmental issues or regulatory systems:

> Legislation came in and England started to do something about it. You've only got to look at EEC legislation, ... the French government sign the paper, the French farmers please themselves, the French fishermen please themselves. And so it has happened with the environment (Interview 6).

Looking to the future

Talking about interactions between business and environmental change and regulation reveals emotions and enthusiasms that seem far removed from the neutered abstractions of many surveys and statistics. It also reveals the potential importance of environmental issues in shaping relations between individual businesses as well as between business and governments or environmental interests. Some of the arguments reported might be regarded as superficial or self-interested, raising concerns as to the extent to which debate about regulation of ozone depleting substances is being couched in environmentally informed terms. There are indications, rather, of the rehearsal of existing, more general, grievances against competitors in a guise that is only superficially novel.

However, such presentations of perceived unfairness in the implementation of environmental regulation by business and governments may impact upon the effectiveness of the Montreal Protocol and related efforts to curb the use of ozone depleting substances. Indeed if such concerns were shown to be widespread they might threaten the effective implementation of regulations that is now necessary if the momentum created through international environmental diplomacy is to be sustained. There is perhaps an analogy with the need for a "hospitable contractual environment" articulated by Keohane

et al (1992) in their study of the political process of the development of environmental regulation. If governments in the original argument, or businesses in the present case, do not have the confidence that rules are being interpreted in the same way and enforced with equal vigour by all parties then a backlash against regulation may ensue. Such concerns may be all the more pressing if we are entering into the stage of the process where, as Parson & Greene (1995) claim, controls on ozone depleting substances "are now becoming stringent and costly for the first time".

Indeed it cannot be assumed that the effective cessation of CFC and halon production will lead to a complete or rapid resolution of the concerns discussed here. For some users of these controlled substances the practical and financial implications of an enforced change to their products or processes of manufacture are yet to be fully resolved. Moreover, some of the chemicals developed as direct alternatives to CFCs will themselves be subject to a tightening regulatory regime. HCFCs are already marked for phase-out during the first half of the 21st century as they too have an ozone depletion potential, albeit much lower than CFCs or halons. There is also increasing pressure for controls on HFCs (ENDS 1995) and here we engage with concerns regarding global warming, a problem destined to raise much more complicated regulatory issues than any previous attempt to secure international environmental agreements. Perceptions of past inequalities cannot make the progress of such future developments any easier.

This is an area in which political analysis of the consequences for relationships between states as parties to international diplomatic agreements is further advanced than exploration of the effects on businesses as the ultimate agents of change. Indeed the literature exploring the potential lessons for future global environmental regulation to be derived from the experience of curbs on ozone depleting substances deals largely with the process of negotiation of inter-state agreements rather than their implementation within particular political jurisdictions (Morrisette 1991; Skjærseth 1992). To redress such imbalances is clearly beyond the limited scope of the present paper. However, in its specific

focus on aspects of business opinion and understanding it reinforces the call for more extensive investigation of the role of business - and not just the major multi-national companies - in addressing global environmental challenges. To involve the broad mass of businesses directly in negotiations to create international regulatory systems is impossible, but the development of a more effective dialogue between regulators and business at a national and local level is essential.

In such a context information is a powerful commodity; it is the agency which will expose and dispel prejudices and any perceptions of inequality in the implementation of regulatory regimes that are unfounded. But crucially, also, it is the means by which business, particularly smaller and medium-sized enterprises, may move towards the environmental goals that have been set for them. With regard to a specific and relatively well-publicised issue such as stratospheric ozone depletion most of the businesses directly affected are aware of the pressing imperative to change products and processes, and many have already done so. But some smaller and medium-sized companies in particular are handicapped by a lack of clear and disinterested information detailing their options for change - which should include not only technocentric solutions and the adoption of direct chemical alternatives to ozone depleting substances. In such circumstances concerns regarding unknown costs and the potential loss of trade may interact with perceptions of inequality in the application of regulation to block the spread of less environmentally damaging practices. Many businesses remain reliant on existing suppliers of chemicals for their information regarding the alternatives to proscribed ozone depleting chemicals. Government departments and trade associations already have a role in providing more impartial advice, but this could usefully be expanded. In particular, the role of local green business clubs in spreading good practice, not least by example, may well prove crucial. If we are to enlist businesses as agents of environmental improvement then their good will and capability has to be cultivated rather than assumed or coerced.

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BIBLIOGRAPHY

Azzone, G. & Bertelè, U. (1994) "Exploiting green strategies for competitive advantage" Long Range Planning, 27(6), 69-81.

Benedick, R. E. (1991) Ozone Diplomacy. New Directions in Safeguarding the Planet, Harvard University Press, Cambridge, Mass.

Birchard, B. (1993) "Corporate environmentalism and Du Pont: An interview with Edgar Woolard CEO" Greener Management International 2, 64-69.

Brenton, T. (1994) The Greening of Machiavelli. The Evolution of International Environmental Politics, Earthscan, London.

Buck, J. (1992) "Green awareness: an opportunity for business". In D Owen (ed) Green Reporting. Accountancy and the Challenge of the Nineties, Chapman & Hall, London.

Department of Trade and Industry (1990) Chlorinated Solvent Cleaning. The Impact of Environmental and Regulatory Control, HMSO, London.

ENDS (1987) "USA, Europe still divided over CFC controls" ENDS Report 149, 24.

ENDS (1988) "The aerosol industry and CFCs: the parting of the ways" ENDS Report 156, 9-11.

ENDS (1989a) "Eco-labelling: a new environmental challenge for business" ENDS Report 169, 11-13.

ENDS (1989b) "Green consumerism: the second wave" ENDS Report 173, 12-15.

ENDS (1989c) "Businesses urged to draft green codes" ENDS Report 179, 3-4.

ENDS (1990) "Company news" ENDS Report 191, 4.

ENDS (1991) "CFC-12 replacement reaches market" ENDS Report 192, 7.

ENDS (1992a) "Company news" ENDS Report 211, 5.

ENDS (1992b) "Refrigeration the odd man out in CFC phase-out" ENDS Report 213, 12.

ENDS (1993a) "Greenpeace wins concessions on ozone-benign refrigerants" ENDS Report 216, 6-7.

ENDS (1993b) "German firms get ahead with 'atmosphere-friendly' fridges" ENDS Report 218, 23.

ENDS (1993c) "German retailer trumps Sainsbury's on 'atmosphere-friendly' coolants" ENDS Report 221, 9-10.

ENDS (1993d) "Brussels launches new talks on ozone depleters" ENDS Report 221, 37-8.

ENDS (1994) "Delays in UK safety approval give German fridge firms the lead" ENDS Report 229, 25.

ENDS (1995) "Refrigeration businesses fight controls on HFCs" ENDS Report 242, 10.

Grant, W., Patterson, W. & Whitston, C. (1988) Government and the Chemical Industry. A Comparative Study of Britain and West Germany, Clarendon Press, Oxford.

Haas, P. M. (1991) "Policy responses to stratospheric ozone depletion" Global Environmental Change 1(3), 224-34.

Jachtenfuchs, M. (1990) "The European Community and the protection of the ozone layer" Journal of Common Market Studies 28(3), 261-77.

Keohane, R. O., Haas, P. M., & Levy, M. A. (1992) "The effectiveness of international environmental institutions". In P. M. Haas, R. O. Keohane & M. A. Levy (eds) Institutions for the Earth. Sources of Effective International Environmental Protection, MIT Press, Cambridge, Mass.

Kux, S. (1995) "Ecology and subsidiarity: the micropolitics of environmental protection". Paper presented at the First Open Meeting of the Human Dimensions of Global Change Community, Duke University, Durham, North Carolina.

Martell, L. (1994) Ecology and Society. An Introduction, Polity Press, Cambridge.

Morrissette, P. M., Darmstadter, J., Plantinga, A. J. & Toman, M. A. (1991) "Prospects for a global greenhouse gas accord. Lessons from other agreements" Global Environmental Change 1(3), 209-23.

Parson, E. A. (1992) "Protecting the ozone layer". In P. M. Haas, R. O. Keohane & M. A. Levy (eds) Institutions for the Earth. Sources of Effective International Environmental Protection, MIT Press, Cambridge, Mass.

Parson, E. A. & Greene, O. (1995) "The complex chemistry of the international ozone agreements" Environment 37(2), 16-20 & 35-43.

Peattie, K. & Ringler, A. (1994) "Management and the environment in the UK and Germany: a comparison" European Management Journal 12(2), 216-25.

Purvis, M., Drake, F., Clarke, D., Phillips, D. & Kashti, A. (1995) "Fragmenting uncertainties: British business and responses to stratospheric ozone depletion" School of Geography, University of Leeds Working Paper 95/12.

Richardson, D. & Rootes, C. (1995) The Green Challenge. The Development of Green Parties in Europe, Routledge, London.

Roan, S. (1989) Ozone Crisis: The Fifteen Year Evolution of a Sudden Global Emergency, Wiley, New York.

Skjærseth, J. B. (1992) "The 'successful' ozone-layer negotiations. Are there any lessons to be learned?" Global Environmental Change 2(4), 292-300.

Smith, D. (ed) (1993) Business and the Environment. Implications of the New Environmentalism, Paul Chapman Publishing, London.

Stern, P. C., Young, O. R. & Druckman, D. (eds) (1992) Global Environmental Change. Understanding the Human Dimension, National Academy Press, Washington DC.

Touche Ross (1990) Head in the Clouds or Head in the Sand? UK Managers' Attitudes to Environmental Issues. A Survey, Touche Ross, London.

Vaughan, D. & Mickle, C. (1993) Environmental Profiles of European Business, Earthscan, London.

Walley, N. & Whitehead, B. (1994) "It's not easy being green" Harvard Business Review May/June, 46-52.

Welford, R. & Gouldson, A. (1993) Environmental Management and Business Strategy, Pitman, London.

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