

Marine Pollution Policy in the UK

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Abstract: This article reviews the objectives and methods of UK government policy to protect coastal and marine waters against pollution. The effectiveness of control measures is considered against a set of published indicators of water quality, and this is followed by a review of economic approaches to marine pollution policy.

Keywords: Pollution, UK government, water quality, oil spills, polluter-pays principle, economic instruments, cost-benefit analysis

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I . Introduction

The past 30 years have witnessed important developments in UK marine pollution policy, influenced in large part by specific events (notably the Torrey Canyon, Amoco Cadiz, Braer and Sea Empress tanker disasters) which have threatened UK national interests. At the same time, however, the approach to marine pollution control in the UK has partially reflected the attitudes and practices of other maritime states, with control measures being designed to fit in with the UK's international obligations towards the protection of the marine environment. UK environmental policy is increasingly driven by the imperatives of the EU, and marine pollution policy is no exception to this.

The paper is organised as follows. The first section outlines the UK institutional framework of controls on marine pollution, and this is followed by an examination of a number of key indicators of water quality in order to establish the extent of improvement or deterioration in the marine environment. The final section reviews economic approaches to marine pollution policy, focussing on the adoption of the 'polluter pays' principle and the use of cost-benefit analysis (CBA) in programmes of water quality improvement.

II. The institutional framework

In the UK various Acts of Parliament provide the statutory basis for the control of land-based and sea-based pollution. The Environment Act 1995 established the Environment Agency, which now plays a significant role in many areas of pollution control affecting the estuarine and coastal environment. Several different government Departments are involved in the implementation of marine pollution policy, with key responsibilities and powers as shown in Table 1. Such fragmentation inevitably gives rise to concern over coordination, though in practice the clearly defined functions of the lead agencies involved in policy implementation(notably the Environment Agency and the Marine Pollution Control Unit) generally ensures that the duties of planning and response do not overlap.

Table 1. U.K. Marine Pollution Control: Summary of Government Responsibilities

Department or Ministry	Responsibilities and powers
Environment Departments	Overall responsibility for UK Government policy on pollution control, with substantial powers enforced through the Environment Agency(EA). EA powers include those necessary to permit or prohibit discharges from land-based sources which may affect territorial or coastal waters
Fisheries Departments	Responsible for control of dumping activity and the regulation of all deposits in the sea (incl. approval and control of dispersants, etc.) which affect marine life. Empowered to close fisheries where there is a risk to consumers arising from a spill
Department of Transport	Empowered to intervene in shipping accidents and to take action (through the MPCU) to reduce marine oil or chemical pollution, or the attendant risks, which threaten UK interests
Ministry of Defence	Responsible for dealing with pollution caused by naval or other MOD vessels and with pollution within naval base waters
Department of Trade and Industry	Responsible for licensing offshore oil and gas facilities, the control of discharges, and the approval of operators contingency plans for oil spills
Foreign and Commonwealth Office	Responsible for matters affecting UK international relations arising from counter-pollution measures (e.g. intervention powers involving foreign registered vessels)

- Notes: (i) The relevant Environment Departments are: the Department of the Environment (DoE) for England; the Scottish Office; the Welsh Office; the Department of Environment (Northern Ireland)
- (ii) The relevant Fisheries Departments are: the Ministry of Agriculture, Fisheries and Food (MAFF); the Scottish Office Agriculture, Environment and Fisheries Department (SOAEFD); the Department of the Environment (Northern Ireland) Environmental Protection Division

The UK has also entered into a number of international agreements to protect the quality of the marine environment. It participates in the London Dumping Convention, the Oslo Convention(dealing with sea-borne pollution) and the Paris Convention(dealing with land-borne pollution). The Oslo and Paris Conventions, which came into effect in 1974 and 1978 respectively, provide the regulatory framework for the protection of the marine environment in the Northeast Atlantic against pollution(Stanners and Bourdeau, 1993, p. 137). Concern at the lack of progress in reducing pollution in the North Sea culminated in the establishment of the North Sea Task Force in 1988, which included the UK amongst its European country membership.

The UK Government sees the main requirement of pollution control in respect of coastal and marine waters as the need to meet water quality objectives, and to this end it is committed to meeting the requirements of the EC Urban Waste Water Treatment Directive (UWWTD) and the Bathing Water Directive (BWD). These two pieces of European legislation are currently the driving force behind UK marine environmental policy. Under the UWWTD, which requires Member States to adopt a consistent approach to sewage treatment facilities, all significant discharges of sewage to estuaries and coastal waters are expected to be treated by the end of year 2005. Secondary treatment has been set as the norm, with provision for nutrient removal where there is evidence of eutrophication or a risk thereof (Bolt, 1995). The Directive has imposed a major duty on UK water companies, which have been enabled since privatisation to raise the high level of finance needed for investment in new coastal sewage treatment works (Hoare, 1997). The industry's efforts should also help in the attainment of the BWD, which sets mandatory and guide values in respect of 11 physical, chemical and micro-biological parameters in order to raise and maintain bathing water quality and protect public health. These parameters include total and faecal coliforms, which are commonly regarded as the main indicators of the degree of sewage contamination (DoE, 1996, p.85). To meet the coliform standards set by the BWD at least 95% of samples taken for each of these parameters over the bathing season should be no greater than the mandatory levels.

The final element in the institutional framework for controlling marine pollution is the system for oil spill prevention and response. The UK Government accepts the responsibility for dealing with major spillages of oil and other hazardous substances at sea from ships that threaten UK interests. These responsibilities are exercised through the Coastguard Agency's Marine Pollution Control Unit (MPCU) which implements the National Contingency Plan (NCP) setting out the action to be taken following a ship-related oil or chemical spill. Other parties with responsibilities for dealing with pollution incidents must ensure that their own contingency plans are consistent with the NCP. Maritime local authorities accept non-statutory responsibility for dealing with pollution from the shoreline, while port and harbour authorities accept responsibility for dealing with pollution within port and harbour limits. In a major oil spill the MPCU is responsible for directing sea operations and coordinating shoreline response. It has at its disposal aerial and seaborne dispersant spraying resources, stocks of dispersant, mechanical recovery systems, cargo transfer resources and shoreline clean-up equipment. The Unit relies on HM Coastguard for assistance, including receipt and initial assessment of pollution reports and provision of communication facilities.

III. The State of the UK marine environment

How effective have these control measures been at maintaining or improving the quality of coastal and marine waters around the UK? Probably the most clearly demonstrated trend has been the increased compliance with the mandatory and guide values for coliform standards, as defined by the BWD (see Table 2). This improvement is attributable to higher sewerage treatment standards, the resiting of discharge outfalls and reduction in storm overflow (DoE, 1996, p. 86). While this trend is to be welcomed, it should not go unnoticed that in 1995 less than half the sampling points in the UK reached the levels recommended by the EU (i.e. the guide values) for bathing water quality. Moreover, compliance with guide values in the UK is markedly lower than in the EU as a whole—for 1995, the comparative figures were 49.6% as against 80.7%. Whether there will be a significant in-

crease in compliance depends on the effectiveness of the new investment currently being commissioned by the water industry, but the situation at present suggests that in the UK there is still room for improvement in the attainment of the coliform standards.

Table 2. Sea Water Quality in the U.K. and E.U., 1992~1995

Date	United Kingdom		European Union	
	Compliance rate (%)		Compliance rate (%)	
	Mandatory values	Guide values	Mandatory values	Guide values
1992	78.7	35.8	88.9	76.7
1993	79.9	30.6	88.6	77.1
1994	82.3	33.7	89.6	77.8
1995	89.0	49.6	92.5	80.7

Notes:

- (i) EU data refer to 11 Member States (i.e. excluding Finland and Sweden).
- (ii) Mandatory values and guide values are as defined in the Annex to the EC Bathing Water Directive 76/160/EEC. These are in terms of two parameters (total coliforms and faecal coliforms) except in Denmark, France and Netherlands where only faecal coliforms are taken into account.
- (iii) Compliance rates are calculated on the basis of the percentage of sampling points complying with mandatory or guide values for seawater quality.

Source: European Commission (1996) Quality of Bathing Water (1995 Bathing Season), Directorate-General Environment, Nuclear Safety and Civil Protection, B-1049, Brussels

Direct and riverine inputs of contaminants from the UK to marine and estuarine waters have been reduced over the past decade, with particular progress having been made in meeting the targets set at the Second North Sea Conference in 1987. The UK Government has claimed substantial reductions in discharges of substance

es regarded as most harmful to the environment ('Red List' substances) apart from zinc (Clappison, 1997). The problem in this case has been caused by diffuse sources (e.g. corrugated iron, cosmetics, car tyres) which, according to the government, have proved to be more significant than originally anticipated in 1987 when the UK agreed to take steps to deal with contaminant pollution in the North Sea. While there is evidence of a reduction in overall metal contaminant loading, pollution from other sources appears to have worsened. Burn (1996, p.72) reports an increase in direct and riverine inputs of nitrate to UK coastal waters since 1990, in contrast to the trend in agriculture for more controlled use of nitrogen fertiliser.

The number of reported oil spill incidents from shipping and offshore installations around the coasts of the UK increased during the 1980s, partly because of improved surveillance methods introduced in 1986 (DoE, 1996, p. 94), but since 1990 the trend has been downwards. Though there are typically several hundred reported incidents each year, most spills involve less than 100 gallons of oil and only a minority involve clean-up (see Table 3). An appreciable number of the larger spills originate from offshore North Sea installations, but dispersal and natural degradation generally ensures that these incidents do not have a significant environmental impact. Shipping accidents resulting in major oil spill incidents have fortunately been rare, but when these occur the effects can be (and arguably have been) ecologically disastrous. The most recent such event in UK waters, the grounding of the tanker *Sea Empress* at the entrance of Milford Haven in February 1996, resulted in the discharge of 70,000 tonnes of oil and a threat to one of the most important natural habitats in the UK. Indeed, more than 30 Sites of Special Scientific Interest, identified because of their importance for marine wildlife or plant populations, were affected by this single incident. The full impact of the disaster, including the economic consequences, will not be known until the *Sea Empress* Environmental Evaluation Committee has delivered its final report later in 1997. The report will, no doubt, shed light on the question of whether the accident might have been prevented and whether the response by the authorities (e.g. the Department of Transport's Marine Accident Investigation Branch and the MCPU) was adequate.

Table 3. Oil Spills around the Coasts of the U.K.

Date	Incidents reported	Spills over 100 gallons	Spills needing clean-up
1984	367	76	140
1985	366	75	130
1986	436	103	126
1987	500	126	105
1988	559	110	120
1989	764	132	160
1990	791	174	136
1991	705	143	169
1992	611	100	156
1993	676	99	155
1994	540	99	123

Source: Department of the Environment (1996) Digest of Environmental Statistics No. 18. HMSO, London References

IV. Economic approaches to marine pollution policy

In keeping with the spirit of the times, the UK Government has recognised the need for economic principles to play a more important role in environmental management. There are two main ways in which this can be implemented: firstly, through the use of market-based incentives for controlling pollution at source, and secondly through the use of CBA in the evaluation of decisions which affect the environment. In the case of coastal and marine water quality some progress has been made in respect of both these economic applications, though there is still a gap between the intention and the deed. It is clear, for example, that despite broad acceptance of the 'polluter pays' principle by the UK Government (OECD, 1993) and a specific policy statement that there need to be "determined efforts to explore the opportunities for economic instruments" in environmental management (DoE,

1997, p. 18), the embodiment of this approach within marine pollution policy has been minimal. Policy is still largely based on laws and regulations designed to limit the strength and volume of pollutants into the marine environment using traditional 'command and control' approaches, with fines for non-compliance being the nearest approximation to market-based incentives.

The one area in which the 'polluter pays' principle could be said to have found practical expression is in the systems used in the UK to recover the costs of clean-up following oil spills. The policy of the UK Government is to seek compensation or cost recovery when a chemical or oil spill incident necessitates clean-up activity or measures to minimise the pollution threat. The clean-up costs would initially fall on the body incurring them (e.g. MPCU, local authority or harbour authority) who would then attempt to claim them back from the vessel owners, their insurers or the relevant international fund. Under the 1969 and 1992 Civil Liabilities Convention (CLC) the ship owner is strictly liable for pollution damage caused by oil spills from his vessel. The shipowner is normally entitled to limit his liability to an amount related to the gross tonnage of his vessel, and is required to maintain insurance or other financial security up to a certain limited amount. Additional compensation is available from the International Oil Pollution Compensation (IOPC) Fund which meets the balance of claims above the shipowners liability. Compensation can be made to private organisations or individuals who have suffered loss of income (e.g. fishermen, hoteliers, etc.) and to governments or other authorities who have incurred clean-up costs or preventive expenditures. An area of difficulty, however, concerns the compensation for environmental damage which, under the CLC and Fund Conventions, is limited to the cost of 'reasonable measures' actually undertaken or planned in order to re-instate contaminated environments. As the WWF has pointed out in the wake of the Sea Empress disaster, this state of affairs is in marked contrast to the situation applying in the US where the Oil Pollution Act imposes substantially higher limits than the CLC and Fund Conventions and much broader coverage of what constitutes 'environmental damage' (WWF, 1996). The implication, therefore, is that the commercial pressures on shipowners associated with the liability for oil spills may not be as strong as the risks to the

marine environment would warrant.

The need for economic valuation of environmental impacts has also been recognised by the UK Government, with the DoE admitting that the failure to take full account of environmental costs and benefits in policy decisions in the past has resulted in resource misallocation (DoE, 1991). An important step in overcoming this deficiency has now been taken by the DoE and the water industry with the publication of a manual for assessing the benefits of surface water quality improvements (Foundation for Water Research, 1996). The manual affirms the commitment by the water industry and its regulators to the principles of CBA, but acknowledges that placing a monetary value on the benefits of water quality improvement is far more difficult than the measurement of incremental cost. The very large investment programmes currently being undertaken by the industry in order to comply with the BWD and UWWTD has underlined the importance of justifying the benefits of this investment to the various user groups. For UK estuarine and coastal waters the principal users include commercial and recreational fisheries, bathing, water sports, pleasure boating and informal recreation. The need to measure 'non-use' benefits of water quality improvements (i.e. existence, bequest and option values) is also acknowledged. In addition, Section 39 of the Environment Act 1995 now requires the Environment Agency to take account of both benefits and costs in deciding the exercise of its powers. The advent of the manual is therefore timely, and represents a major opportunity for new environmental obligations to reflect all relevant costs and benefits and for water improvement schemes to be prioritised on economic grounds.

V. Summary and conclusions

Pollution of the coastal and marine waters around the UK originates from land-based sources, reaching the sea via rivers, as well as from vessels and offshore installations. Measures for controlling marine pollution take the form of prevention, monitoring and response to emergency, with many of these measures being based on international conventions. The dominant influences over UK marine policy at

the present time are the EC Bathing Water Directive (BWD) and the Urban Waste Water Treatment Directive (UWWTD), and the agenda set by this legislation has invoked a response on the part of both the UK Government and the water industry in an attempt to raise water quality. The Government has become increasingly aware of the need for an economic approach to marine pollution policy, though the application of the 'polluter pays' principle has so far been largely confined to the cost-recovery criteria used in the aftermath of oil spill incidents at sea. The role of CBA in the valuation of water quality improvements has lately been given practical endorsement through the publication of a manual of benefit assessment procedures for use by the water industry and its regulators.

Whether UK marine pollution policy is adequate for the task depends to a large extent on the true state of the marine environment and the threats it faces in the future. While the official indicators of coastal and marine water quality are reasonably encouraging, there is a view in some quarters that the environmental health of European coastal seas is at greater risk from pollution than is commonly supposed, and that "significant ecological collapse is not far away" (Linley-Adams, 1993). Though this perception of the current state of affairs may be extreme, there is no denying that the problem of marine pollution control is likely to become more difficult in the future as the pressures on the coastal zone increase. The contention of this article is that the existing framework of controls may be just about capable of containing the problem but only by imposing a still more restrictive set of regulations on potential polluters. A recent sign of this is the establishment of new legal powers in January 1997 which allow the Environment Agency to issue enforcement notices on companies, requiring them to make improvements to their operations in order to prevent pollution before it occurs (Environment Agency, 1997). Praiseworthy though this may be it illustrates the essential weakness of administrative approaches to pollution control, which is that they depend for their effectiveness on the ability of the regulator to stay one step ahead of pollution problems by adding further controls to those already in existence. Arguably what is required is greater reliance on market-based incentives for internalising the externalities of pollution, in ways that are now becoming more widespread in other

countries or are under active consideration (Hughes, 1992; Garrod and Whitmarsh, 1995). These have the advantage of encouraging rather than coercing firms to move in the direction of environmentally responsible behaviour, and should help to contain the mounting cost of monitoring and eco-toxicological testing that accompanies a policy based on environmental quality objectives. The intention of the UK Government to place more reliance on economic instruments of marine pollution control is to be applauded, though it remains to be seen exactly what form such instruments will take.

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