Green Design

Design for the Environment

Dorothy Mackenzie

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First published in Great Britain in 1991
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Foreword

The contribution that design can make to improving environmental performance is increasingly being recognised. Over the last few years many companies have made considerable progress in improving the environmental performance of their manufacturing operations, but in many industries the major impact comes from their products in use, or when disposed of. Improving the environmental performance of products, through intelligent design, is now a major focus of interest.

A great deal of progress has been made in architecture, with many of our leading architects demonstrating their understanding of environmental priorities in showcase buildings. But the vast majority of new buildings remain largely untouched by concerns such as energy efficiency or the avoidance of toxic materials.

This book aims to recognise, through the use of case histories, the progress that is being made in many areas of design, and the interesting ideas and new directions which are beginning to emerge. None of the examples can claim to be completely "green", and there will inevitably be aspects of many of them which could be criticised. In some cases, cost or aesthetic motivations may have driven the design, with environmental improvement an accidental rather than intentional result. Some examples are given of improvements to products whose very existence may be open to question on the grounds of utility or harmfulness. It is, though, part of the task of designers to minimise the damage done by the products we currently use, while helping to create new, less harmful ways of addressing people's needs.

Despite the progress that has been made, there remains a need to demonstrate the significance of the designer's contribution to minimising environmental problems, by setting out the relationship between design decisions and environmental issues. The book is intended to help designers ask the right questions, rather than to deliver unequivocal answers.

Some background to major environmental issues is covered, although the book focuses on the implications of the issues for the design process. A wide range of excellent reference books is available, some of which are listed at the end, together with organisations which can provide further, more detailed assistance.

One objective of this book is to demonstrate that designs which take account of environment considerations can be commercially successful, functional and highly aesthetically attractive. There is little point in producing environmentally sensitive solutions if they are too expensive, inconvenient or unattractive for anyone to want to buy and use them. There is no reason why designing for minimal environment impact should produce drab, poor-quality results which give satisfaction only through guilt reduction.

The incredible rate of change in the solutions available and in the development of new thinking means that any book on this subject is always out of date. For that reason, detailed technical information on materials and production techniques has been avoided; it is always best to check directly with manufacturers or professional associations for the latest developments.

The need to build consideration of environment impact into the design process will pose enormous problems and challenges, but it will also be a stimulus for innovation and creativity. Above all, it will provide real opportunities for designers to demonstrate the value of their problem-solving skills and the breadth of their contribution.

Right
A wind farm near Palm Springs, California (see page 25).

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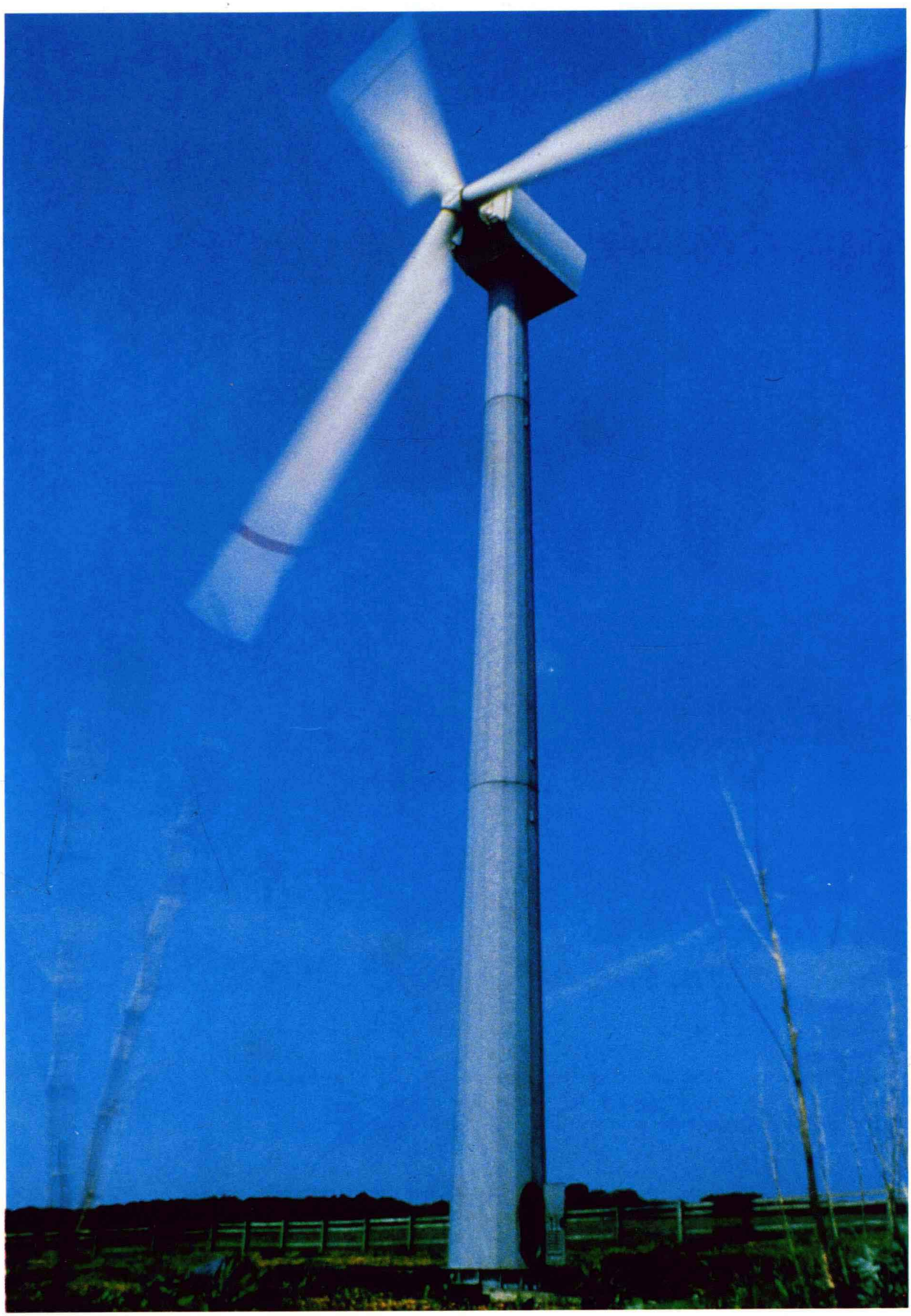


1 Introduction

"In this age of mass production when everything must be planned and designed, design has become the most powerful tool with which man shapes his tools and environments (and, by extension, society and himself). This demands high social and moral responsibility from the designer." (Victor Papanek, *Design for the Real World*, 1970)

The idea that designers should take into consideration the environment impact of their work is not new. Thirty years ago Victor Papanek argued convincingly that the designer was in a powerful position, able to help create a better world, or contribute further to planetary destruction. His ideas – that designers should resist designing built-in obsolescence; that consumers' needs, rather than their wants, should be addressed; and that designers should strive to find ways of using their skills for socially useful ends, especially in developing countries – outraged much of the design establishment at the time.

Today, however, ideas which once seemed utopian and naive appear highly relevant and almost inevitable, given the unprecedented levels of concern being expressed throughout the world over environmental problems. Twenty years ago, environmentalism was regarded as an activity for the radical fringe; now, governments strive to demonstrate their environmentalist credentials, and problems attract high levels of popular concern. There is a growing consensus that problems affecting the environment cannot be ignored. As a result of dramatic scientific evidence of ozone depletion and new scientific agreement about the impending problems of global warming, a new sense of urgency has arisen.

Rising public concern is being translated into action in many countries: people are demonstrating their feelings through their voting preferences, by joining environment campaigning groups, by changing their behaviour to accommodate recycling or energy efficiency, and by using environment criteria in their purchasing decisions as consumers.

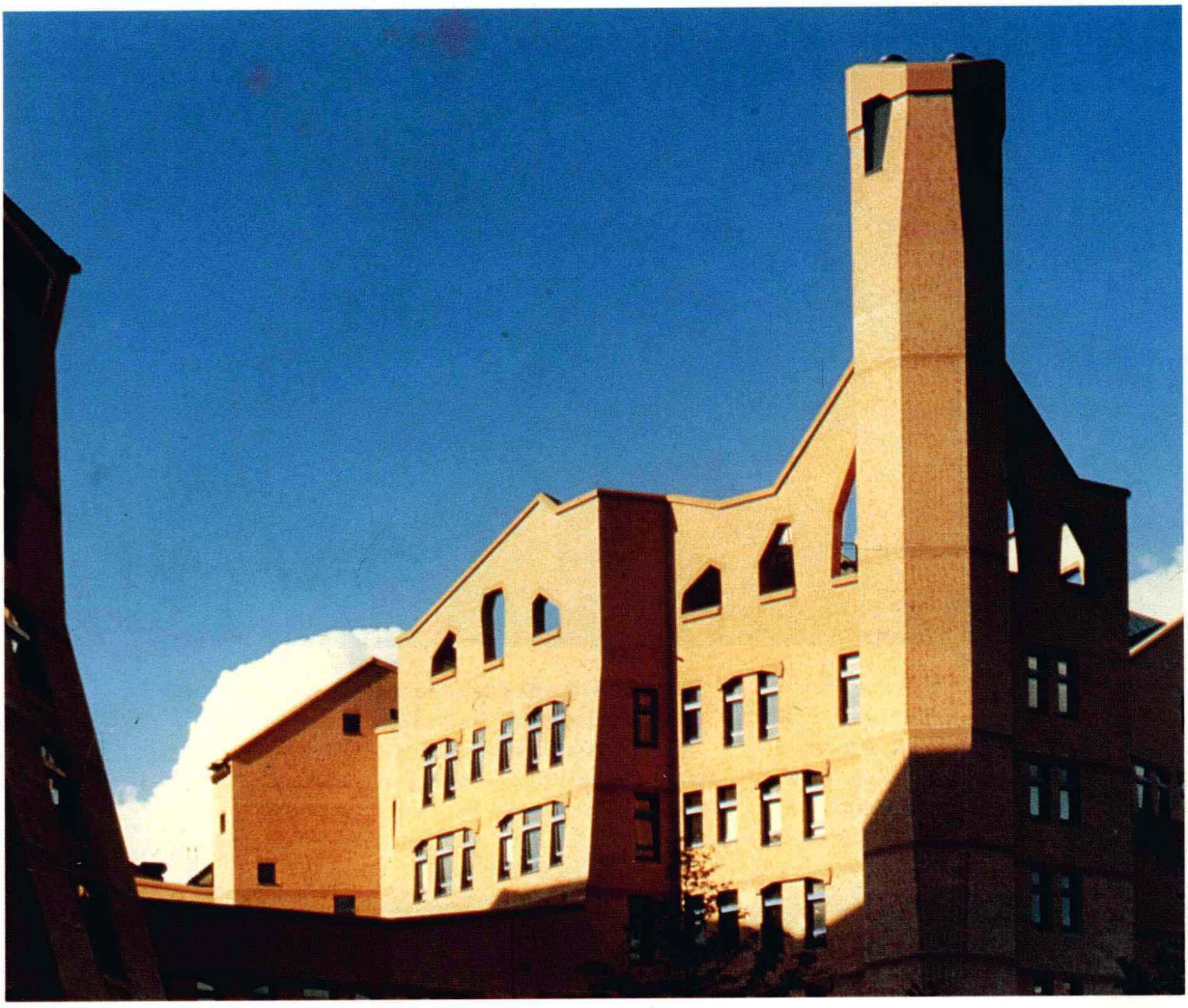
We are entering a period when environment performance, together with a wide range of ethical and moral issues, will be on the agenda for business, government and individuals. New criteria will evolve for judging the acceptability of products and processes; new methods will emerge to calculate the true cost of activities; new regulations will control industrial and individual behaviour. Decisions about the nature of our society and economy may well be underpinned by a growing commitment to sustainable rather than uncontrolled development.

Are designers equipped to respond to the new demands which will arise from these changes? The answer is almost certainly no, as it must be for almost all professionals trained without reference to the environment impact of their activities.

In most places, design has not been taught in the context of its social and ecological impact. Many designers assume that their area of responsibility is limited to function and appearance. In some fields, most notably architecture, a broader view has sometimes been taken because of the scale of the direct impact of buildings on their local environment. But even here, little attention has been paid to the implications of the type of construction materials used or, for example, to the energy efficiency of the lighting system.

One might be able to argue that up until now designing with environment impact in

Below
Exterior of the corporate headquarters of the NMB Bank in The Netherlands, designed by Alberts and Van Huut for energy efficiency and employee satisfaction. The natural environment has proved hugely popular with the staff working there (for a detailed analysis, see pages 56-9).



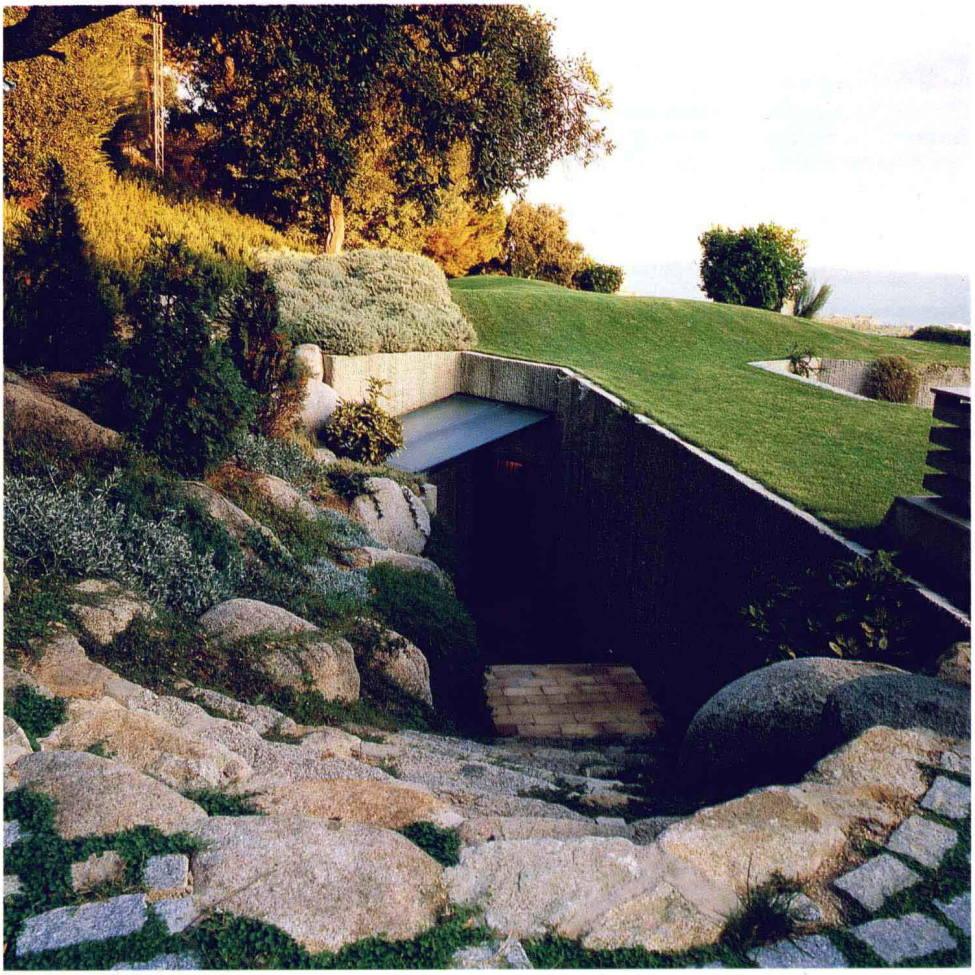
mind was a matter of personal taste or individual moral responsibility. Now it is clear that it will become a commercial imperative. The value and role of designers will be substantially reduced if they cannot incorporate new concepts and new criteria into their work.

There is an opportunity for designers to show imagination and leadership, pioneering the way forward and solving real problems.

For many years, designers have been asserting their influence and demonstrating the power of design. The new demands of designing for minimum ecological impact will provide an ideal platform from which designers can justify their claims and acknowledge their responsibilities.

The role and responsibility of the designer

Why should so much responsibility fall to the designer? Design is one part of a holistic process, which involves a wide range of other skills. However, design is a pivotal part of the process.



Left & right
A semi-buried house designed by Javier Barba in Catalunya, Spain. The soil provides natural insulation and maintains stable internal temperatures throughout the year, minimising any need for extra heating. South-facing windows and glazed doors maximise solar gain, while the tiled floors store heat. Shutters and a canvas awning help regulate the heat during the summer. The roof is covered with grass to help integrate the house into its surroundings (compare the house in Denmark shown on page 47). With the glazed south face providing light and panoramic views, there is little sense of living underground. This house was featured as a case study by Project Monitor, an EC initiative to study passive solar architecture.

Many environmental problems are caused by the pollution which results from the production and use of products and services, particularly mass-produced products. Most products and services use up natural resources, many of which are irreplaceable. The method by which raw materials are extracted from the earth can cause severe local environmental problems. The manufacturing process itself uses energy, creates waste, and may result in harmful by-products. The product has then to be distributed –

Sustainable development

Sustainable development was defined by the Bruntland Commission (The World Commission on Environment and Development, published in 1987) as meeting "the needs of the present without compromising the ability of future generations to meet their own needs". The implication is that for development to be sustainable, it must take account not just of economic factors, but also of environmental and social factors, and must assess long-term consequences of actions as well as short-term results.

Some businesses are beginning to consider how they might become sustainable. At a minimum, they need to take the full environmental costs of their activities into account when assessing their investment decisions or their day-to-day performance. They will have to consider whether their supply of raw materials can be produced indefinitely, and whether their products and services actually contribute to meeting human needs in ways which have the minimum environmental impact. Concepts such as "eco-efficiency" – which means the delivery of the maximum benefit to the user, with the minimum use of resources and the least possible environment damage – are now being developed by major companies as a tool to help them progress towards sustainable business.

raising other environmental issues – following which it is used. Many products have a significant effect on the environment when in use – cars, for example, or detergents, or paints. And finally, the product may be disposed of, causing another set of problems.

The designer, as the principal determinant or creator of the product itself, has a direct influence on the amount of damage which will occur at each stage in the process. What materials will be used, and from where will these be obtained? How will the product be manufactured? Are particular processes required to give a specific effect or appearance? How will the product be used and disposed of – is it designed to be easy to repair, or to be thrown away? If it is to be disposed of, can parts of it be re-used or recycled? Designers, as creators or specifiers, are in a position to determine many of these issues.

But designers also influence environment impact indirectly, through their role as setters of styles and tastes. In some countries, most notably the UK, the Eighties saw a dramatic rise in the recognition of the importance of good design. But by the end of the decade the word "designer" had become devalued almost to the point of becoming pejorative, because it had become associated with superficial glitziness, with a proliferation of expensive, unnecessary objects whose sole purpose was to convey social status upon their owners. Design was criticised as elitist, and was seen to be relevant to only a narrow area of activities – primarily industries making consumer goods. Designers have participated fully in the disposable society, creating new styles with increasing frequency, and therefore necessarily building in obsolescence. They have often been criticised by environmentalists for failing to use their skills and influence to useful purpose.

Until now, many designers may have felt that, if they wished to use their skills, they have had no alternative but to participate in the misuse of design. Now, however, as individual values and business priorities are beginning to change, they have the opportunity to demonstrate that environmental considerations, along with social and ethical

concerns, occupy a central position within mainstream design thinking.

Designers can now speak from an authoritative platform in most countries, and they increasingly occupy key positions in major companies. The contribution that design can make to business performance is now widely recognised, and many governments have been active in encouraging industry to work closely with designers to improve the quality and competitiveness of their products and services.

> "The effective use of design is fundamental to the creation of innovative products, processes and services. Good design can significantly add value to products, lead to growth in sales and enable both the exploitation of new markets and the consolidation of existing ones. The benefits of good design can be seen in:
>
> - processes improved by gradual innovation
> - redesign of existing products in response to user needs, new markets and competitor products
> - development of new products by anticipating new market opportunities
>
> The challenge is to integrate design into business processes." (UK Government White Paper on Competitiveness, 1995)

The role of designers as the link between the manufacturing process and the customer, between technical and marketing requirements, has given them an important position in many companies in areas such as new product development. Designers have an opportunity to demonstrate their ability to take on the complex and challenging issues which surround designing to improve environment impact. This will require thorough research before starting the design process, and an understanding of environment issues and the ability to know where to look for guidelines. However, unless the company is committed at the highest level to improving its environment performance, the systems and culture will tend to thwart all but the most determined designer.

The commercial imperative

Many businesses are beginning to realise that long-term commercial success depends on acceptable environment performance. Environmental problems such as resource depletion and pollution are disruptive and costly, and poor environment performance, such as industrial accidents, can call into question the social acceptability of a company. The suspicion which many people feel about "big business" is legitimised by any evidence of a careless approach to the protection of the environment. Poor environment performance can also considerably reduce the attractiveness of a company for investment purposes. Exposure to liabilities such as those created by responsibility for contaminated land can significantly affect a company's financial strength. Some major investors, such as public service worker pension funds in the US, adopt environmental and ethical criteria which influence their investment portfolio, and green investment funds have attracted an enthusiastic following – for their commercial as well as environmental performance.

Many of the large companies regarded as being the leaders in their fields are now incorporating environment criteria into their definition of "quality", through programmes such as Total Quality Management. Some have practised several aspects of good environment performance for many years, inspired by a desire to reduce waste. 3M's "Pollution Prevention Pays" programme (see page 15), and Dow Chemical's "Waste Reduction Always Pays", are good examples of companies identifying a commercial benefit in sound environmental practices.

Many of the most active programmes have been in industries at the forefront of environmental problems, such as the chemicals industry and the oil industry, but such programmes are now beginning to gain acceptance across a much wider spectrum. Up until now, however, the majority of companies which have considered environment issues at all have done so because they were forced by legislation to address problems they themselves were causing – such as river pollution or the emission of harmful gases – or because there were substantial cost savings to be achieved, or because of issues related to the health and safety of their workforce. Now there are a number of additional pressures, which will mean that environment issues will move increasingly centre-stage for industry.

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