

THE BIO-ENVIRONMENT AS A MANAGERIAL CHALLENGE

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If you work in the chemical industry, you immediately become aware of a societal conflict. My contribution to the environmental attitudes of industrial organisations is based on my experience as an executive with a Swiss multinational chemical company, and my active participation in national and international industry associations, where environmental issues are top items on the agenda. Although the benign effects of chemical products are taken for granted, public opinion often associates the word "chemical" with something "undesirable." While it is mandatory for industries to reduce their burden on the environment, this must be seen as a stimulus for further development. The chemical industry is not only concerned with environmental issues but, thanks to its capacity for innovation, it can also offer viable solutions.

It is true that pressing transboundary issues such as ozone depletion, toxic air emissions and waste disposal, tougher regulations and mounting public opinion have forced industry to focus more on environmental problems and to offer more advanced solutions to these issues. The required notification for the introduction of new substances, the permit requirements for production and disposals as well as the changing attitude of suppliers and customers, have introduced a radical change in the modus operandi. In this process of change, we can also include the increased awareness, on the part of investors, and internally, regarding public image and liability. Last but not least, this response is stimulated by the "eco-sensitivity," or "eco-smartness," of younger employees.

Environmental responsibility is not just the result of a new moral stance or a novel business ethic. Today, it is a basic factor for economic success. For a business enterprise, it involves a complex set of tasks for management and expense for the company. After years of involvement in this field, I believe that only persistence and commitment can ensure sustained environmental progress. Managing the environmental challenge requires, however, a pragmatic approach with controlled stages of progression. Strategic and operational ecological considerations will lead to effective programmes, provided they are, in the medium and long-term, closely linked to business objectives and, from an economic point of view, affordable. This rather utilitarian way of presenting the issue might deviate from some of the currently prevalent rhetoric of entrepreneurial environmental benevolence. Yet from a practical point of view, we must postulate, for a synthesis of profitability and environmental goals, two areas that common wisdom views as antagonistic by definition. In this interaction the regulatory pattern must work as a catalyst, international organisations having the responsibility for ensuring the indispensable harmonisation of the environmental rules.

By now, it has gained general acceptance that the environment is not a "free," but an "economic" asset with an associated cost or, price. As a consequence, industrial enterprises must include the cost of appropriate ecological measures in their accounting and in their investment practices. The cost involved, begins at the product or process-development stage and continues through the chain of production and marketing, to the ultimate disposal or recycling. It is evident that such a system must be carefully managed, as an integral part of industrial operations. The associated annual expenses and capital requirements, in the case of the Chemical Industry, amount to at least the level of pre-tax profit. Industry, like other human activities, has inherent characteristics that makes its impact on the environment unavoidable. These consequences involve solutions which are both expensive and time consuming. The paradigm of economic and ecological compatibility follows a rather simple line of reasoning: When, business enterprises start to internalise the "external cost" - and in this respect the appropriate systems of the public and private sectors are evolving quite rapidly - the environment is regarded as a valuable input factor. The simplest way to express economic efficiency is through the optimisation of the input/output relationship. Since everything cannot be resolved at once, within the frame of regulatory compliance, management must set priorities of action in order to ensure that the most effective impact is achieved at a specific cost. The impact must be measurable in terms of value, for both the environment and the business enterprise.

A recent technological development in my own company gives me the opportunity to offer an illustration that this implied symbiosis is not just an abstract concept. As a leading producer of Maleic Anhydride, an important organic intermediate possessing many applications, we used to manufacture it in the classic way, by oxidising Benzene, the well known molecule consisting of six carbon atoms. In this oxidation process, only four carbon atoms react and two are burned. In terms of raw materials, this production method was, therefore, rather expensive and ecologically burdensome (high carbon dioxide emissions as well as other undesirable emissions). Intensive research efforts led to a novel proprietary technology for Maleic Anhydride, using as raw material n-Butane, the much cheaper C4 hydrocarbon, whose atoms react to produce not only Maleic Anhydride, but a large quantity of high-pressure steam as well, which is used to generate 20 MW of electrical energy in a turbine. The positive ecological impact is obvious. The economics of the process are such that, with these raw materials and energy efficiencies, we can depreciate, within 4-5 years, a US \$70 million new plant which we constructed in Ravenna, and shut down the older Benzene based plant. This, with some marginal investment in the air purification systems, could have fulfilled the new regulations. Meanwhile, we have also licensed the new technology world-wide 7 times. Fifty-percent of the world capacity of Maleic Anhydride is now based on this environmentally-friendly process, for which we have received from the European Union, and also the United Nations, a

prestigious environmental award. This value-adding example of economic and environmental synergism is certainly not an isolated one for this innovative industry. The main point is that the focus of environmental management must be geared to improving eco-efficiencies. In this respect it is worth stating that the integrated (and more demanding) approach of pollution prevention at the source will have to prevail over measures of "end of the pipe" waste treatment.

Managing the environmental challenge successfully and, thereby, gaining long-term competitive advantages, is a demanding task. As new environmental rules continually emerge and large sums of money are required, the economic incentive to be as "clean" as possible becomes even greater. Recognising that regulations are now focused more on ultimate results, a proactive managerial approach is necessary, because of the interrelationship between environmental issues and their impact on other business functions, such as research and development, raw material selection, production, transportation and marketing, proactive companies factor ecological developments into their programmes. The resulting benefits are measurable in terms of better utilisation of raw materials and energy, less pollution, or better treatment and disposal. Already we can see in the market place competitive advantages for companies with environmentally proactive management systems. Minimum compliance with regulations can never be more than a temporary competitive advantage. The speed of change will make slow movers non-competitive. More pressure will come, precisely from the environmental leaders who will require comparable standards from their business partners. The trend in this direction is already evident.

In order to be effective, environmental issues must be made plausible to the internal micro cosmos of a business enterprise. Transmitting environmental consciousness throughout a big company is a lengthy process and well designed methods must be applied. Needless to say, only environmental awareness training, designed for each level and function, and the appropriate incorporation of MIS (Management Information Systems) can make improved performance possible. In a company with environmentally conscious employees, with well introduced emergency prevention and preparedness systems, with resource commitments to research and development, environmental goals are easier to achieve. The basic rules of conduct are incorporated in written corporate policies, and environmental stewardship is a top management responsibility. Nevertheless, a degree of continuous supervision is required, mainly to monitor the progress and to establish through operations new standards of performance, as well as to provide the necessary assurances. Establishing measurable goals that can be periodically reviewed is essential, if a corporate policy is to be kept alive. Important management tools are also the regular aimed at monitoring and verifying progress. Such audits are not only oriented to check compliance with regulations but are conducted against an evolving set of criteria, and provide assessment of the overall operational performance of the company's environmental functions. Last but not least, good internal and external communications are basic elements of proper environmental management.

Business leaders have not spared words committing themselves to the new "post Rio" environmental ideology of "sustainable development." Indeed, the rhetoric makes us all accountable and we must work hard to meet expectations. The momentum of the debate continues and we can see a genuine effort among business enterprises to establish an equilibrium between the environmental imperatives and their "do-ability" in a competitive economic environment. Beyond their adherence to their internal programmes, business leaders must contribute, through their knowledge and management expertise, to formulating a stimulating public environmental policy and raising standards, via technology transfers, in the less developed areas of the world.

As a member of the Chemical Industry I am happy to report that our industry, through its national associations, has made a unique public commitment through the voluntary "Responsible Care" programme. Its two major aims are:

- improving the industry's performance in the areas of environment, health, safety, product safety, distribution and public relations
- enabling companies to demonstrate that such improvements are indeed taking place

Since an increasing number of companies has accepted the implementation codes of the Responsible Care Programme, which are compatible with the comprehensive sixteen principles of the Charter of Sustainable Development issued by the ICC (International Chamber of Commerce), I am confident that we will make much progress and I hope we will be recognised as responsible participants in this uphill battle for a better world.

The preservation of an intact bio-environment ultimately depends on the educated choices of billions of individuals. As a business executive, I must, therefore, admit that environmental excellence, while demanding appropriate financial and organisational support, depends above all on the right ethic and the right spirit. To promote such a spirit within our business enterprises, as part of society, is indeed our foremost managerial challenge, with respect to the bio-environment.

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