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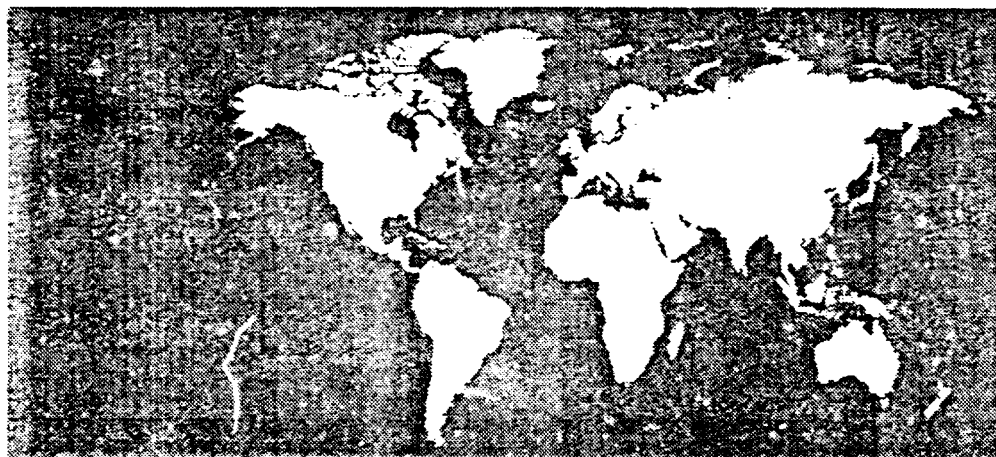
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Panel VI Environmental policies and industrial competitiveness



Issue Paper

Environmental policies and industrial competitiveness

Prepared by
the UNIDO Secretariat



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

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LIST OF ABBREVIATIONS

ESID	Ecologically Sustainable Industrial Development
EMS	Environmental management systems
GEF	Global Environment Facility
MBIs	Market-based instruments
NSDSs	National Strategies for Sustainable Development
SMEs	Small- and medium-scale enterprises

INTRODUCTION

1. The relationship between environmental policies and industrial competitiveness has been examined at length in the background paper entitled "Environmental Policies and Industrial Competitiveness: Are they Compatible?". Evidence cited in the paper suggests that the link between the two is complex and that in general the impact of more stringent environmental regulations on competitiveness *per se* will be insignificant in the medium to long term. Possible exceptions to this may arise in the case of eco-labelling requirements by developed-country importers, and certain small scale and/or resource-intensive sectors.^{1/}

2. Working on the premise that the economy as a whole will be able to maintain its competitive position in world markets despite stringent environmental regulations, the real issue, especially for the forthcoming decade concerns *the effectiveness of environmental expenditures in terms of reduction of pollution emissions per unit of output*. In the paragraphs below a number of issues relevant to this central concern are presented for discussion by the panel.

- The widespread application of cleaner production processes as opposed to end-of-pipe treatment only.
- Use of environmental management systems by industry.
- The emergence of non-tariff and market barriers such as eco-labelling requirements as perceived threats to profitability of enterprises.
- Efficient resource management by industry and Government (especially water and energy).
- Adoption of ecologically sustainable industrial development strategies.
- Greater use of market-based instruments to ensure the internalization of environmental costs.
- Special programmes to address the concerns of small-scale industry.
- Tackling global environmental problems e.g. greenhouse gas emissions, within the framework of international conventions and agreements.

I. APPLYING CLEANER PRODUCTION PROCESSES AND TECHNOLOGIES

3. Traditional approaches to pollution reduction have been based on the application of end-of-pipe technologies in order to meet discharge standards set by regulatory authorities. However the growing recognition that reduction at source is a potentially more cost-effective method of abatement is resulting in replacing and/or complementing end-of-pipe technologies with cleaner production processes. The application of the latter is not without problems for developing countries, especially for small- and medium-scale enterprises.

^{1/} For a detailed analysis, see UNIDO background paper, prepared by the UNIDO Secretariat, *Environmental Policies and Industrial Competitiveness: Are they Compatible?*, (ID/WG.542/27(SPEC.)).

4. Major **constraints** faced by developing countries in adopting cleaner production methods relate to:

- Lack of awareness about the environmental and financial benefits of cleaner production activities.
- Lack of information about techniques and technologies.
- Inadequate financial resources to purchase imported technologies.

5. These constraints are certainly not insurmountable. A coordinated effort by industry, government and international organizations can go a long way in overcoming them.

6. Key questions that need to be addressed are as follows:

(a) *Need for local capacity building, information dissemination, training and education: cleaner production centres:* International organizations must do more to help developing countries to take advantage of cleaner technology. The activities of UNIDO with respect to information dissemination, training and education, the preparation of information materials and local capacity-building seem an appropriate way to help developing countries to take advantage of cleaner industrial technologies. These activities can be expanded, both on a bilateral and multilateral basis, with the involvement of regional banks. An assessment should be made of the inputs necessary to build local capacity for the implementation of cleaner-production outreach programmes in developing countries, including inputs needed from developed countries. The assessment could lead to an international programme for cleaner production, taking into account regional needs and priorities;

(b) *Need for sub sectoral demonstration projects:* Projects that demonstrate the environmental and economic benefits of cleaner production and waste minimization can be an effective tool for increasing awareness about the advantages of pollution abatement. These projects may be undertaken by industry in collaboration with Governments and/or international agencies. UNIDO has successfully completed sub sector demonstration projects in several countries including the cement sector in Egypt, cane-sugar in Mexico, and pulp and paper, textile dyeing and finishing, and pesticide formulation in India. The demonstrations stress both environmental improvements and financial payback;

(c) *Need for increased cooperation between environmental market sectors in developing and developed countries:* The environmental market sector in developing countries is mainly confined to ordinary end-of-pipe hardware and software. Neither it nor the machinery sector in those countries is able to supply clean production hardware and software, which are often too expensive to import. Thus, local capabilities have to be built up, and for this, cooperation with the private sector is needed in terms of identifying market opportunities, examining the feasibility and promoting the manufacture of such technologies or the development of know how.

(d) *Need for life-cycle analysis and research on environmentally compatible products:* This is necessary to increase the market demand for environmentally sound products from developing countries. Questions relating to the impacts of life-cycle analysis and ecodesign on industrial and agricultural production in developing countries will need to be addressed. Related issues pertaining to the impact of increased demand for environmentally sound products in industrialized countries on the potential for new export markets in developing countries will need further investigation.

II. IMPLEMENTING ENVIRONMENTAL MANAGEMENT SYSTEMS

7. Environmental management systems (EMS) include organizational structure, responsibilities, practices, processes and resources for implementing and maintaining environmental management. The main tools of such corporate management practices include environmental auditing, environmental reporting, and environmental impact assessments. Environmental management systems should enable organizations to achieve and demonstrate sound environmental performance by controlling the environmental impact of their activities, products and services, taking into account self-determined environmental policy and objectives. It also enables an organization to anticipate and meet growing environmental performance expectations, to ensure ongoing compliance with national and/or international requirements (such as ISO 14000) and to continually improve its environmental performance.

8. The adoption of EMS by enterprises in developing and developed countries may require extensive training of corporate staff. A practical and effective means of doing this is through the design and support of joint capacity strengthening programmes by industry associations in developing countries and bilateral and multilateral agencies. Such programmes may also include the development of domestic consulting capabilities in EMS.

III. COUNTERACTING THREATS FROM INCREASED ECO-LABELLING REQUIREMENTS

9. The increasing export orientation of production in developing countries makes it necessary for them to maintain their competitive position in foreign markets. The emergence of a wide variety of eco-labelling requirements and the lack of timely information on the multitude of schemes may adversely affect certain export sectors in developing countries.

10. Following are some initiatives that need to be considered in counteracting perceived threats:

(a) *Information dissemination:* Technical subsectoral studies on different eco-labelling schemes need to be undertaken in order to examine the incidence of such schemes and the possibilities for mutual recognition. UNIDO has prepared such a study for the leather and leather products industry. The same may be repeated for other subsectors

such as textiles and garments. Studies of this nature could also be used to develop international guidelines for awarding eco-labels;

(b) *Life cycle analysis:* Since eco-labelling procedures are based on a cradle to grave approach, local industry associations should be supported in training their staff on the cradle to grave management style of production and marketing, with due consideration for local comparative advantages and resource availability;

(c) *Establishing certification centres:* Assistance may be given to private sector associations in obtaining easy and inexpensive access to an internationally recognized certification scheme based on mutual recognition. This may be done for example by establishing certification offices and accreditation bodies in exporting countries. This would entail training of local inspectors by specialized organisations and certifiers from developed countries. An example of such a scheme is a pilot project sponsored by the French aid agency for the introduction of ecocertification for sustainable forestry in Africa in response to threats of boycotting tropical timber products from Africa. Certification centres may also assist in the establishment of graduated qualification systems that indicate the level of "eco quality" of a product, provide more accurate information to importers and consumers regarding the environmental friendliness of the product, and make market access easier for developing-country exporters. This an important area where multilateral assistance would be required;

(d) *Infrastructure support:* Technical and institutional support for infrastructure facilities for testing, monitoring, certification, and research and development are lacking or insufficient in a number of developing countries. Multilateral assistance may be coordinated closely with the private sector to provide these facilities.

IV. MANAGING AND CONSERVING WATER RESOURCES

11. It is estimated that by 2025 there will be a global crisis in water resources. Accelerated growth of industry in developing countries will lead to increases in industrial water use by 2.3 times the use levels of 1990. Moreover, major industrial water pollutant loads in 2025 are expected to increase to 5.2 times the levels of 1990. The changing trend in demand and use patterns requires an integrated approach to managing water resources by industry, agriculture, municipalities and Governments. The rationale for such an approach derives from the concept of water as a unitary good that may be used in its natural form or may be recycled and treated for reuse. The main elements of an industrial water management strategy can be identified as follows:

(a) *Analytical services:* This involves assessment of water consumption by industry subsector and by country; projection of industrial water demand given economic growth projections; and analysis of existing pricing structures;

(b) *Promotional services:* On the basis of water conservation potentials, there is a need to demonstrate/promote changes in technology (*i.e.* its economic efficiency) and managerial practices required to improve water conservation;

(c) *Services for the development of industry and water supply infrastructure:* Based on assessment of weaknesses in water supply infrastructure there may be a need to design, promote or standardize equipment, and to involve industries and different levels of public authorities in the effort to develop adequate infrastructural facilities.

V. IMPLEMENTING ECOLOGICALLY SUSTAINABLE INDUSTRIAL DEVELOPMENT (ESID) STRATEGIES

12. Agenda 21 calls on Governments to adopt National Strategies for Sustainable Development (NSDSs) that "build on and harmonise the various sectoral, social and environmental policies that are operating in the country".

13. NSDSs currently being prepared by national Governments suffer from a number of drawbacks as far industry coverage is concerned. First, they focus almost exclusively on environmental issues and do not integrate industrial and environmental concerns. Second, they do not set (industrial) sector-specific quantifiable environmental objectives nor time frames for achieving them. Third, they do not specify how specific industrial subsectors and plants will meet environmental objectives. Lastly, they are formulated with minimal involvement of industrial institutions and private sector associations.

14. In order to bring out the industrial dimension of sustainable development, integration of the industrial sector into the NSDS process is extremely important. UNIDO advocates the formulation and implementation of ESID strategies as an effective means to do this. This involves building capacities within the industrial sector (in Ministries of Industry as well as industry associations):

- To establish environmental goals and action plans for the industrial sector;
- To develop an appropriate mix of policy instruments that support the goals of those plans;
- To devise appropriate monitoring and enforcement measures to realise those goals.

VI. USING MARKET-BASED INSTRUMENTS TO INTERNALIZE ENVIRONMENTAL COSTS

15. As mentioned in the previous section, a key aspect of an ESID strategy is to develop and implement an appropriate mix of policy instruments in support of environmental objectives and goals.

16. Market-based instruments (MBIs) and economic incentives as complements to command and control measures for pollution prevention and resource conservation in industry have been the subject of many theoretical and conceptual discussions for a number of years. Whereas there is general agreement on their usefulness and efficiency as cost-effective policy measures that internalise environmental costs, very little by way

of practical implementation of these measures has been done in developing countries. An important question that remains unanswered is the response of industry to the introduction of market based instruments, including realistic resource pricing. A firm's decision to invest in cleaner production depends primarily on the relative costs of pollution control in overall production costs; price elasticities of supply and demand for intermediary and final goods; and, the competitive position of firms in a particular industrial sector. Similarly, the extent of conservation of natural resources that comprise production inputs depend on the price of those inputs as well their demand and supply elasticities. If MBIs are introduced, an estimation of the costs of control will be needed to judge the response of industry and to determine the nature and magnitude of policy instruments. This makes it imperative to undertake sector-specific case-studies.

17. Case-studies on internalization of environmental costs of industrial activities may be undertaken in selected countries. One study on the steel industry is under way in India and similar studies can be done for other countries. *An important aspect of these studies is that they will be undertaken jointly with private/public sector companies who will have the opportunity to make proposals based on a comprehensive analysis of their costs of control.* Recommendations based on this analysis may then be presented by the industry to their Governments for discussion. *This would be a unique exercise that involves industry in direct policy dialogue with Governments, based on a scientific and economic analysis of pollution abatement costs and reduction in pollution loads.*

18. The results of case-studies can be used to formulate policy recommendations that combine the use of market incentives with traditional command and control measures in the most suitable manner. These recommendations must be accompanied by measures for a strengthened programme of environmental enforcement. Consideration may be given to schemes that shift the main burden of monitoring from the Government to the private sector; for example by requiring third party monitoring, or the setting up of polluter/pollutee clubs to treat and monitor waste discharge.

VII. ADDRESSING CONCERNS OF SMALL- AND MEDIUM-SCALE INDUSTRY^{2/}

19. Small- and medium-scale enterprises (SMEs) not only contribute to productivity growth and employment but are also important as collective sources of localized pollution loadings such as organic wastes in water effluent, as well as hazardous wastes - heavy metal sludge, solvents, waste oils, acidic and alkaline wastes, photo wastes etc. Often these wastes are disposed of in an unsafe manner and are extremely difficult to monitor. These problems are further compounded by the fact that for many of the small- and medium-scale industries the costs of control in relation to output may be too high. Often such enterprises operate in highly competitive markets and are only marginally profitable, so even a modest increase in the costs (of environmental regulations) may threaten their viability. Even though the technological solutions for pollution prevention and control may be well known and easily available, there is no

^{2/} For a detailed analysis, see Luken & Kumar (1994), "Waste Minimization Programme for Small Scale Industries - An International Perspective", in *Productivity*, Vol 35.

guarantee that they will be adopted. Moreover even when policy measures are in place, their enforcement and monitoring is a real problem for the small- and medium-scale sector on account of their large numbers and diversity. A large number of these firms are not even recorded in official surveys further aggravating the problem of monitoring and enforcement.

20. It is clear that the environmental problems of SMEs require special attention and special measures and innovative approaches are needed to address their particular problems. The recommended strategies for the prevention and control of pollution emissions and wastes may be classified into three broad categories - **policy, institutional and enterprise levels.**

Policy level actions

21. At the policy level, the following aspects may be considered:

- Giving priority to pollution prevention rather than pollution control;
- Using market-based instruments as complements to command and control measures;
- Recognizing SMEs as a special case in environmental legislation;
- Adopting proper industrial site and relocation policies.

Institutional level actions

22. Institutional level actions may consist of:

- Setting up environmental extension services for SMEs;
- Creating information dissemination cells;
- Facilitating common waste treatment facilities;
- Promoting outreach from large firms to SMEs.

Enterprise level actions

23. These may include:

- Supporting demonstrations of the financial and environmental benefits of pollution prevention measures;
- Promoting self-initiated demonstrations at enterprises through the provision of grants to enterprises.

VIII. IMPLEMENTING THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

24. The United Nations Framework Convention on Climate Change, while being a non-binding treaty, has identified the imperative "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic

interference with the climate system".^{3/} Industrial energy consumption is a major source of greenhouse gas emissions.

25. In developing countries, industry's share of energy consumption ranges from 27 per cent in Africa to 38 per cent in Latin America and 49 per cent in Asia. A small number of raw materials processing industries account for most of this consumption, including iron and steel, non-ferrous metals, chemicals, non-metallic mineral products, textiles and pulp and paper. These sectors are also responsible for a large proportion of industry's share of greenhouse gas emissions and other pollution.

26. Energy consumption is continuing to rise in developing countries, since their improvements in energy efficiency, although considerable, have not kept pace with rising manufacturing output.

27. In addition to industrial growth, there has been structural change in the manufacturing sector away from traditional, labour-intensive light manufacturing to more energy-intensive production and processing of raw materials. Urban growth, electrification, and developing basic infrastructure all raise energy intensity during industrialization.

28. Through the United Nations Framework Convention on Climate Change, developing nations, like all other countries, are being urged by the world community to contribute to the common goal of reducing greenhouse gas emissions. However, they may not have adequate means to do so and will therefore require international assistance.

29. The main requirements of developing countries are:

- Access to the best energy-efficient technologies available on the world market where such technologies are relevant to their natural resource endowments, their industrial requirements and are cost effective;
- Building an energy-efficient capital stock by accelerating the deployment of low energy intensity processes and equipment;
- Strengthening national capabilities for energy-efficient design and manufacturing.

30. Areas where **technical expertise to implement the Convention** is necessary include:

- Preparing national "communications" on greenhouse gas emissions. The communications are supposed to contain an assessment of the magnitudes and sources of greenhouse gases as well as identification of reduction methods.
- Analyzing the impact of climate change response measures on the economic and industrial development of developing countries, with the view to identifying

^{3/} Article 2 of the United Nations Framework Convention on Climate Change.

economically viable technology options for reducing greenhouse gas emissions from the production and consumption of energy;

- Supporting technology transfer for improvement in the efficiency of the fossil-fuel-based power generation, with concomitant improvements in environmental performance;
- Promoting technology transfer for the use of renewable sources of energy such as biomass;
- Developing and implementing technology transfer for energy efficiency programmes in industry, in complementarity with cleaner production/pollution prevention measures.

31. A number of these activities are supported by international funding arrangements such as the Global Environment Facility (GEF) which awards first priority to climate change. International organizations such as UNIDO are assisting developing countries and countries in transition to implement programmes and projects that enable them to meet the requirements of the climate change convention.

IX. CONCLUSIONS

32. The brief and non-exhaustive list of issues presented in this issue paper constitute essential ingredients for improving the effectiveness of environmental expenditures as measured by reduction in pollution emissions per unit of output. Their ultimate success in doing so would depend on how effectively they are implemented by industry, by Government and by multilateral and bilateral agencies.