World Business Council
for Sustainable Development

Eco-Efficiency and Cleaner Production

Charting the Course to Sustainability

UNEP
Environment Programme

The World Business Council for Sustainable Development (WBCSD)

The World Business Council for Sustainable Development (WBCSD) is a coalition of 120 international companies united by a shared commitment to the environment and to the principles of economic growth and sustainable development. Its members are drawn from 34 countries and more than 20 major industrial sectors. The WBCSD also benefits from a thriving global network of national and regional business councils and partner organisations.

The WBCSD was formed in January 1995 through a merger between the Business Council for Sustainable Development (BCSD) in Geneva and the World Industry Council for the Environment (WICE), an initiative of the International Chamber of Commerce (ICC), in Paris. Those two parent bodies had been at the forefront of business's response to the challenges arising from the Earth Summit in Rio de Janeiro in 1992.

Its work programme - comprising a number of working groups with company representatives - deals with policy development (e.g. Sustainable Production and Consumption, Trade and Environment) and environmental management issues (e.g. Eco-Efficiency, Environmental Assessment, Environmental Shareholder Value). The WBCSD is also involved in a number of field projects in developing countries and countries in transition.

UNEP and the Cleaner Production Programme

The United Nations Environment Programme (UNEP) recognises that industrial development will only be truly sustainable on sound ecological foundations. The Industry and Environment centre of UNEP (UNEP IE) has been in operation since 1975 to promote cleaner and safer industrial production and consumption patterns. Co-ordinating action with all UNEP units, UNEP IE has formed partnerships with business and industry, the public sector, and international and non-governmental organisations.

Increasingly, the Cleaner Production Programme has been UNEP's main focus since its inception in 1989. Strongly endorsed by Agenda 21, the action programme signed by 150 heads of state and government at the 1992 Earth Summit in Rio, Cleaner Production helps industry and governments develop their competitive economic and ecological edge. The Cleaner Production Programme strives to achieve its objectives by focusing its activities in two areas, information transfer and capacity building.

The Cleaner Production Programme aims to:

- ✓ increase world-wide consensus on 'cleaner production vision'
- ✓ catalyse implementation of policies and strategies, environmental management systems, environmentally sound technologies, products, and the establishment of UNIDO-UNEP National Cleaner Production Centres
- ✓ support the network of organisations dedicated to promoting cleaner production and eco-efficiency
- ✓ help enhance capabilities through training and education
- ✓ support demonstration projects and provide technical assistance

Contents

Foreword

Defining the concepts

Eco-Efficiency starts from issues of economic efficiency which have positive environmental benefits, while cleaner production starts from issues of environmental efficiency which have positive economic benefits.

Cleaner Production

The concept of Cleaner Production was introduced by UNEP Industry and Environment in 1989. Cleaner production is the continuous application of an integrated preventive environmental strategy applied to processes, products, and services to increase eco-efficiency and reduce risks for humans and the environment. It applies to:

- production processes: conserving raw materials and energy, eliminating toxic raw materials and reducing the quantity and toxicity of all emissions and wastes
- products: reducing negative impacts along the life cycle of a product, from raw materials extraction to its ultimate disposal
- services: incorporating environmental concerns into designing and delivering services

Cleaner production requires changing attitudes, responsible environmental management, creating conducive national policy environments, and evaluating technology options.

Eco-Efficiency

The concept of eco-efficiency was first coined in 1992 by the Business Council for Sustainable Development (BCSD) in its landmark report, ***Changing Course***. Eco-efficiency was further defined at the first Antwerp Workshop on Eco-efficiency held in November 1993 as being 'reached by the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life cycle, to a level at least in line with the earth's estimated carrying capacity'.

The WBCSD has identified seven success factors for eco-efficiency:

- reduce the material intensity of goods and services
- reduce the energy intensity of goods and services
- reduce toxic dispersion
- enhance material recyclability
- maximise sustainable use of renewable resources
- reduce material durability
- increase the service intensity of goods and services

These elements clearly build upon, and help further, the successful United Nations cleaner production initiatives towards sustainable production and consumption patterns.

UNEP and WBCSD: a joint commitment

The United Nations Environment Programme (UNEP) and the World Business Council for Sustainable Development (WBCSD) have each been developing and promoting similar concepts, i.e. cleaner production and eco-efficiency. Both organisations have been actively involved in the policy development of these concepts and have decided to work together to disseminate them. This new initiative combines UNEP's public sector interests and WBCSD's industry representation, which complement each other.

This document is the first output of this joint action. It has been prepared for the United Nations Commission on Sustainable Development (UNCSD) annual meeting held in April-May 1996 in New York. The purpose is threefold:

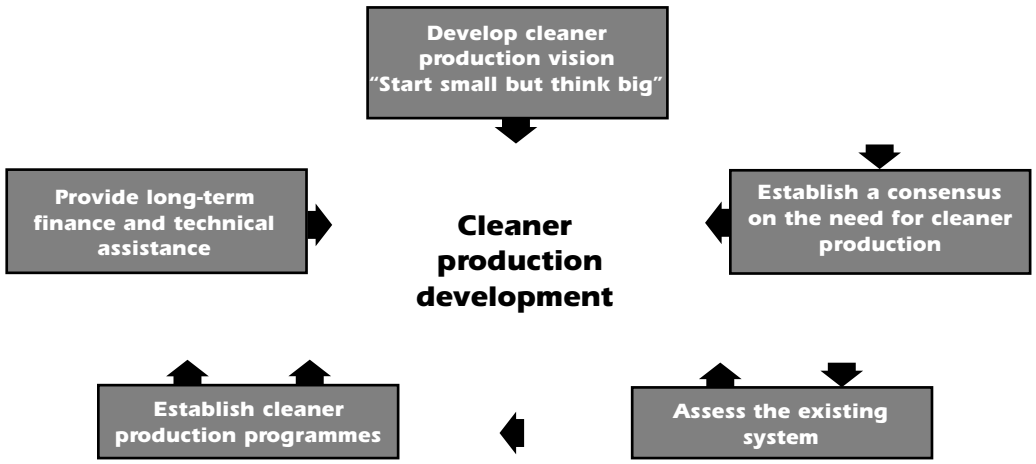
- ✓ to catalyse industry/government partnerships to promote eco-efficiency and cleaner production, two related concepts for sustainable development
- ✓ to demonstrate the common efforts of UNEP and the WBCSD to promote these concepts at the international level
- ✓ to exemplify the voluntary actions undertaken by industry to implement these concepts 'from the laboratory into the market', and demonstrate the economic value they bring to corporations and shareholders

The broader Sustainable Production and Consumption vision

Both concepts are integral parts of the macro-vision of Sustainable Production and Consumption (SP&C) which encompasses the entire commercial system and its interrelations.

SP&C was defined at the Oslo Ministerial Roundtable in February 1995 as 'the production and use of goods and services that respond to basic human needs and bring a better quality of life, while minimising the use of natural resources, toxic materials, and

The overall strategy for cleaner production development



emissions of waste and pollutants over the life cycle, so as not to jeopardise the needs of future generations'.

The WBCSD identified SP&C more specifically as a concept which:

- ✓ forms an integral part of the broader sustainable development agenda, where the focus is on the sustainable production and use of goods and services
- ✓ encourages continuous improvement in efficiency of the use of energy and resources (i.e. in the patterns of consumption)
- ✓ involves changes in the supply and the demand for goods and services
- ✓ promotes the idea that both consumer durables and non-durables can be compatible with sustainable production and consumption
- ✓ emphasises a life cycle perspective in the manufacture, use, reuse, recycling, and disposal of goods and services, rather than the traditional focus on discrete activities

CHAPTER 1 The links between Cleaner Production and Eco-Efficiency

The interlinkages between eco-efficiency and cleaner production are numerous. Like cleaner production, eco-efficiency links the goals of business excellence and environmental excellence, by creating the bridge through which corporate behaviour can support sustainable development, the integration of economic growth and environmental improvement.

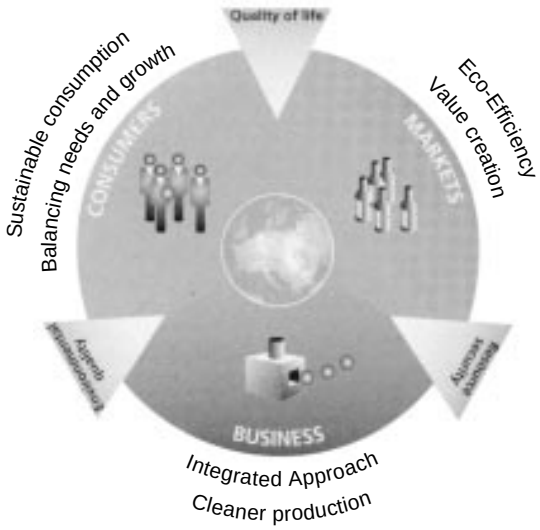
Eco-efficiency goes beyond resource use and pollution reduction by emphasising value creation for business and society at large, while providing for competitive needs. By increasing value for the goods and services it creates, business will maximise resource productivity, gain bottom-line benefits, and reward shareholders, rather than simply minimise wastes or pollution.

Eco-efficiency embraces cleaner production concepts such as efficient use of raw materials, pollution prevention, source reduction, waste minimisation, and internal recycling and reuse. It captures the idea of pollution reduction through process change as opposed to the earlier end-of-pipe approaches. It shares characteristics with many environmental management tools such as Environmental Assessment or Design for Environment by including them among the technological options for reducing material and energy intensiveness in production, as well as facilitating reuse through remanufacturing and recycling. Eco-efficiency also features a life cycle perspective which follows products from the raw material through to final disposal stages. It is thus an extension of the Total Quality Management process.

Eco-efficiency is an evolving concept which allows companies to adapt to the changing dynamics of the marketplace. Companies are now faced with new demands from more stakeholders, and those who implement eco-efficient practices will be able to respond more aggressively to competitive pressures and anticipate customer needs, while at the same time protecting the environment and employee health and safety.

Put in simple terms, the vision of eco-efficiency is to 'produce more from less'. Reducing waste and pollution, and using less energy and fewer raw materials is obviously good for the environment. It is also self-evidently good for business because it cuts companies' costs, and eventually avoids potential environmental liabilities. It is, therefore, a prerequisite to the long-term sustainability of business.

A path towards Sustainable Development



Assessing environmental impacts for cleaner products

An eco-efficient company understands and seeks to minimise the environmental impact of its products throughout their life cycles. Such companies will provide added value from their activities by monitoring and assessing their impact at every stage.

Assessing environmental impacts for cleaner products can assist companies in their quest for continuous improvement by identifying ways of maximising profits through reducing waste and liabilities, raising productivity and demonstrating the company's sense of responsibility towards its customers and the environment.

Companies are starting to use environmental assessment in a systematic manner to define goals, collect data, assess impacts, control effects and ultimately communicate to its stakeholders. Indeed, some companies are now requiring environmental impact assessments as part of their product development cycle with action to mitigate findings wherever possible. The ***Volvo*** *Environmental Priority Strategies (EPS) System*, for instance, assesses the environmental impacts of products and processes in terms of ecological and human health consequences. The results are built into a computer system that derives a composite score of the environmental impacts of any given product design. On this basis, alternative materials and product configurations can be evaluated in an iterative process to establish an optimum design.

The EPS system assists design engineers in the selection of environmentally preferable materials for product construction. In one such case, two technically equivalent constructions for the front end of a car, one using a plastic composite and the other galvanised steel, were compared. Environmental Load Units were calculated for production, product use, and product disposal at end of life for each material. The plastic construction proved to have a lower overall environmental impact. The galvanised steel received a less favourable score because its heavier weight increased fuel consumption during product use.

The framework for Life Cycle Assessment

Goal definition and scope

1. Goal definition and scope

Inventory analysis

2. Constructing the process flow chart
3. Collecting the data
4. Defining the system boundaries
5. Processing the data

Impact assessment

6. Classification and characterisation
7. Valuation

Improvement assessment

8. Reporting and improvement assessment

The components of the LCA framework

1. Goal definition and scope

The product(s) to be assessed are defined, a functional basis for comparison is chosen and the required level of detail is defined.

2-5. Inventory analysis

The energy and raw materials used, and emissions to the atmosphere, water and land, are quantified for each process and then combined in the process flow chart.

6-7. Impact assessment

The effects of the resource use and emissions generated are grouped and quantified into a limited number of impact categories which may then be weighted for importance.

8. Improvement assessment

The results are reported in the most informative way possible and the need and opportunities to reduce the impact of the product(s) on the environment are systematically evaluated.

Dow Chemical has developed a 6-point eco-efficiency compass to guide its eco-innovation efforts. It challenges Dow's product managers to:

- ✓ **Dematerialise** in order to reduce the 'mass burdens' resulting from the raw materials, fuels and utilities used in the system to deliver the desired product function.
- ✓ **Increase energy efficiency** to identify where the highest energy is used, and subsequently redesign the product or its use to make significant energy reductions.
- ✓ **Eliminate negative environmental impacts** as well as reduce and control the dispersal of toxic elements introduced at one end of the system.
- ✓ **Close the loop** by recycling effectively and efficiently. Designing for recyclability is essential but recycling becomes unproductive when the energy, materials and pollution used in collecting, preparing and processing the recyclate exceeds those used to produce the goods in the first place.
- ✓ **Borrow from natural cycles** to design the system as part of a larger natural cycle - where materials are borrowed from and returned to nature - without negatively affecting its overall balance.
- ✓ **Extend service and enhance function**, especially at the usage phase, to improve eco-efficiency.

Designing and producing cleaner products

Designers, mostly concerned with product performance and aesthetics, must take into account the effect of design details on energy/material requirements for manufacturing, use and secondary use (repairability, remanufacturability and recyclability). Companies should also pay closer attention to energy use and emissions. Major improvements in energy efficiency can often be achieved at little or no cost, even with net savings, through the use of targeted programs.

Design for Environment has been part of the commitment of ***Xerox*** for years. The 'Document Company' has set its environmental goal to be 'waste free products manufactured in waste free factories'. Using 1990 as a base year, *Xerox* embarked on a five-year effort to create waste-free factories. Operational criteria include 90% minimum reduction in solid waste to landfills, air emissions, hazardous waste, and process wastewater discharges.

Product stewardship, whereby a company considers the upstream and downstream implications of its activities, is a key aspect of *Xerox*'s programme. A number of factors have enabled the company to pursue this goal, among them making environmental considerations a product requirement and developing recycled material specifications for remanufacturing. This shift highlights the contrast between new and old systems. For instance, copy cartridges were disposable when first introduced but, under various pressures, *Xerox* has introduced a take back system in which cartridges are taken apart and components recycled. This form of product stewardship illustrates the importance of life cycle thinking, assuming that manufacturers will share responsibility for products from cradle to grave along with suppliers, consumers and others in the life cycle chain.

Sony has responded to environmental expectations and needs in the design of its televisions by introducing, in 1995, 'Green TVs' in its European production lines. With consideration given to disassembly characteristics, weight and cost, the new TV sets were designed with significant environmental improvements: recyclable materials were promoted, plastics reduced in both type and

variety, halogen-free flame retardant materials used and hazardous substances during production eliminated.

Towards extended product responsibility

Extended product responsibility is an emerging concept that uses the life-cycle approach to identify strategic opportunities for cleaner production and eco-efficiency. It also highlights the crucial impact of consumer needs and preferences, government procurement, and the role played by those on the chain of production and distribution.

In its report released in February 1996, the ***United States President's Council for Sustainable Development***[1] identifies extended product responsibility as a means to improve 'the current fragmented approach to waste reduction, resource conservation, and pollution prevention'. This means that manufacturers, suppliers, users, and disposers of products all have a role to play in minimising the negative environmental effects of products and waste streams. Ultimately, the Council believes that sharing responsibility for environmental effects will yield a more efficient use of resources, cleaner products and technologies, improved relations between companies or communities and responsible consumer choices.

Cleaner Production and Eco-Efficiency in Tourism

Tourism is the largest and fastest growing industry in the world, and its rapid growth is fuelling the economy in many developing countries, especially in Asia. The tourism industry's impact on the environment and the potential for change cannot be underestimated: in 1995 alone, tourism has produced close to 11% of world GDP and generated an estimated US$ 3.4 trillion in gross output. Because of its 'intangible' nature, the service sector such as tourism has traditionally been behind in embracing the concepts of eco-efficiency and cleaner production.

UNEP, in partnership with the International Hotels Association (IHA) and the International Hotels Environment Initiative (IHEI), has published an **Environmental Action Pack for Hotels**. This publication is intended to serve as a first-step guide for small and medium-sized hotels, which form a large part of the hotel industry, to set up and improve environmental management initiatives.

The Action Pack provides practical information, checklists and examples concerning key issues such as environmental self-audits, priority action areas (energy, solid waste, water, effluents and emissions, choosing contracts and suppliers), the integration of environmental management in daily operations, and progress monitoring.

As a follow-up action of this document, the three organisations have begun to convene regional seminars to provide a showcase for good environmental practices. The first of these meetings, focusing on Asia, was held in Thailand in October 1995. As the resolution of the meeting, hotel business leaders agreed to push forward environmental action through their own hotel companies and to support the efforts of national associations. At the international level, IHA has been entrusted with facilitating the exchange of experiences among national hotel associations. UNEP has pledged to support these efforts by providing technical and educational information through various UN units.

UNEP is now planning to take the Action Pack a step further by assessing the possibility of adapting its contents for the hotel school

[1] *The President's Council for Sustainable Development (PCSD), launched by President Clinton in 1993, is an example of the follow-up actions to Agenda 21 taken throughout the world. The Council, composed of leaders from business, government, environmental and non-profit organisations, was given the task to translate the vision of a 'sustainable America' into concrete recommendations and action plans.*

curriculum, and also by exploring the possibility of a project of identifying existing sources of 'sustainable technologies' for tourism.

Funding and financing Cleaner Production and Eco-Efficiency

As environmental concerns have become more central to the thinking of industrialists, banks and other financial institutions are starting to realise they can no longer ignore the environmental performance of the businesses they rate or invest in. Bankers and insurers are making attempts at integrating eco-efficiency in their lending decisions as it impacts a company's creditworthiness. Their assumption is that corporations with bad environmental performance pose a high financial risk and have a poor shareholder value.

Translating eco-efficiency into numbers within companies is a difficult task. Some indices like waste minimisation and energy intensity are easy to measure but others, such as the expenses for environmental protection, are more critical. Indeed, a company with high expenses does not necessarily have a good environmental performance as its efforts can be focused on end-of-pipe technology.

By integrating environmental criteria in their credit-approval process, banks can avoid lending to customers with unknown or uncovered risks like contaminated sites. This is the first step at looking at the ecological efficiency of a borrower. The second is to know how to calculate the risk premium of the loans. Those who are able to rate the eco-integrated economic risks of a customer will reduce costs by owning a credit-portfolio with higher quality customers, hence with lower bad-debt provisions, and offer very competitive conditions by knowing the customers' risks and managing the 'risk adjusted pricing'.

Swiss Bank Corporation is in the process of integrating environmental criteria into its customer rating system. This will allow it to use 'risk adjusted pricing' by focusing on relevant and reasonable environmental facts, and to assess risks and opportunities in the industrial, financial and management auditing of its borrowers. As a routine, the bank investigates the risk exposure of every project in order to make the risk more transparent to the risk manager. *Swiss Bank Corporation* has implemented a three-step approach to detect possible risks:

- ✓ information provided by customers
- ✓ screening carried out by internal bank specialists
- ✓ independent risk evaluations by consultants

The European industrial insurer, ***Gerling***, examines very closely the environmental performance of its customers before agreeing to carry their environmental risks - either in third party liability insurance or in fire insurance. The better the environmental safety-performance of its customers, the less chance environmental claims will occur, and this consequently leads to lower insurance premiums. It is a kind of safety-supervision the company offers to its customers by advising them on how to improve environmental safety standards.

Reducing environmental risks enables the achievement of adequate safety and emissions control, especially by ensuring safe disposal of toxic or hazardous wastes - this refers to the traditional end-of-pipe mode. Moreover, it involves cleaner production. Both of these are prerequisites for eco-efficiency as environmental risk declines in inverse proportion to eco-efficiency. In other words, the more eco-efficient the firm, the lower its risk factor and subsequent premium are likely to be.

CHAPTER II Industry/government partnerships in promoting Cleaner Production and Eco-Efficiency

The WBCSD/WEC Industrial Eco-Efficiency Programme in Bulgaria and Romania

In partnership with the Swiss government, the WBCSD and the World Environment Center (WEC) have launched a joint initiative in Bulgaria and Romania, the **Industrial Eco-Efficiency Programme**.

The overall programme objective is to bring an appreciation of the inherent economic value of eco-efficiency to selected sectors of industry by means of Awareness Workshops and the adoption of eco-efficiency principles through low-cost Waste Minimisation Demonstration Projects. Existing Pollution Prevention Centers (PPC) will be strengthened by establishing a local PPC, in a region of each country, which will help spread waste minimisation to other companies in the region.

The first year of the Industrial Eco-Efficiency Programme will focus primarily on implementation of Eco-Efficiency Workshops, Waste Minimisation Demonstration Projects laying the foundation for local companies to initiate their own waste minimisation programmes, and the development and strengthening of a local Pollution Prevention Center in Timisoara, Romania and Pleven, Bulgaria.

Starting in the second year, a Project Identification and Financing initiative will develop the necessary information to train the industrial community to apply for and manage market-rate financing so as to be able to invest in the larger waste minimisation opportunities and to introduce the Swiss financial community to potential new clients.

This initiative exemplifies the value of partnerships. The adoption of eco-efficiency as a process calls for a spectrum of persons involved from the beginning. These include: universities, local environmental protection agencies, NGOs, local politicians, research institutes, industry representatives, and media.

The Pollution Prevention Pilot Project (4P)

The **Pollution Prevention Pilot Project** (4P) is a unique partnership led by a core group of experts from the ***Natural Resources Defense Council (NRDC), Amoco Petroleum,*** the ***Dow Chemical Company, Monsanto Company, Rayonier,*** and the ***New Jersey Department of Environmental Protection.*** With a shared industry-environmentalist perspective, the group has begun to identify opportunities to cut production and environmental costs while reducing and preventing pollution at two chemical manufacturing facilities - a Dow Chemical plant in La Porte, Texas, and a Monsanto plant in Pensacola, Florida.

Through site specific work, the group is exploring what internal, external, or regulatory barriers may have kept the plants involved from already practising cost-saving pollution prevention. If these obstacles were removed, projected cost savings, for one project at the Dow Chemical plant alone, would yield US$ 500,000 each year and a projected return on capital of two dollars for each dollar invested. There could be several additional projects at that site which could yield similar results. Moreover, early evaluations indicate that significant environmental improvements could be achieved by looking for creative ways to address environmental issues. Later, the group will craft policy proposals to be jointly advocated to state and federal government agencies in order to spur economic and environmental progress.

The 4P initiative demonstrates that industry and the environmental community can work

together for success - towards enhanced environmental improvements, policy reform and economic savings. It also highlights the value of collective as opposed to unilateral efforts.

The UNIDO/UNEP National Cleaner Production Centre Programme

Building capacity at the local level is an effective way to ensure that both public and private sectors adapt and continue cleaner production. Capacity building exercises entail showing the industry and government theoretical and practical sides of cleaner production, which can foster changes in thinking, application, and the overall framework.

The UNIDO-UNEP programme to establish **National Cleaner Production Centres** (NCPCs) contributes to the local capacity building. The centres are hosted by a local non-governmental institution that has committed its own resources to carry out training, information networking, industry demonstration projects, and policy analysis. The centres have been established in Brazil, China, the Czech Republic, India, Mexico, the Slovak Republic, Tanzania, and Zimbabwe in late 1994 to 1995, with plans of expansion in the second phase.

The NCPC's primary beneficiaries are industry and governments. The centres work with industry to show the economic and environmental benefits of cleaner production (the bottom up approach), while working with governments to set a policy framework to reward cleaner production (the top down approach).

To maintain the neutrality between government and industry, the host institutions for the NCPC in most cases are non-governmental organisations such as a national productivity council, a research academy, or an industrial forum of enterprises.

The National Cleaner Production Centre in Zimbabwe

In 1994, the Environmental Forum of Zimbabwe, a group of leading local private industries, took the initiative to host the **National Cleaner Production Centre**. The Centre was formed in response to the local industrial concerns to the Business Charter for Sustainable Development, whose sixteen principles for environmental management will be addressed by the Centre.

The Centre has received significant responses from industry interested in participating in the demonstration of cleaner production. The centre has selected six factories from sugar refining, breweries, packaging, and timber product manufacturing, and has completed the feasibility analysis of cleaner production options. The challenge for 1996 is to work with the factories to implement and follow-up the suggested measures.

Discussions with university engineering lecturers and associated engineering boards and polytechnic colleges have resulted in the training of graduate engineers. The polytechnic colleges also have plans to develop a curriculum for sugar refining based on the demonstration project.

UNEP-World Bank-NEPA project to build Cleaner Production mechanisms in China

In line with China's effort to integrate cleaner production into its policy and industry, the National Environmental Protection Authority (NEPA) requested UNEP's involvement in a World Bank technical assistance project. The project, started in 1993, was designed to meet the following goals:

- ✓ adapt the cleaner production methodology to suit local Chinese needs
- ✓ develop training materials to educate Chinese professionals for the demonstration projects
- ✓ carry out several industry demonstration projects to prove:
  - efficiency and effectiveness of the cleaner production methodology in China
  - short and long-term economic and environmental benefits of cleaner production for Chinese industry
  - variety of technological and managerial options for cleaner production in the participating enterprises
- ✓ identify and analyse policies which affect cleaner production in industry
- ✓ formulate recommendations for effective policies to implement cleaner production based on a specific timetable
- ✓ build a cleaner production network to disseminate the project results among governmental and industrial stakeholders
- ✓ build expertise in cleaner production across China within a wide range of institutions

The project has yielded significant results:

- ✓ 600 people participated in cleaner production training sessions, with 150 staff officially qualified in cleaner production auditing. Approximately 10% of auditors underwent further training to become trainers, which resulted in second and third generation trainees.
- ✓ 29 cleaner production audits were carried out in 27 enterprises, resulting in:
  - annual economic benefits of US$ 2.9 million from the adoption of management or technology changes which required little or no investment
  - average pollution load reduction of 30-40%, in some cases even reaching 95%
  - identification of technology changes requiring investments totalling US$ 200 million that could save more than US$ 215 million a year
  - completion of five policy studies to help frame effective cleaner production policies

This successful collaborative demonstration project has had a substantial catalytic effect elsewhere in China.

Another step forward

With a sound capacity base, the next step for cleaner production in China is strengthening its financial mechanism. To do so, the World Bank and UNEP are currently preparing a revolving fund project in Yantai City and Xiaoqing River basin in Shandong province. The two loans will amount to US$ 20 million, with 50% funding from China, and are expected to last for 20 years from 1997.

Companies can submit loan applications by conducting a cleaner production assessment and putting together a one to three year plan, depending on the loan amount, for cleaner production implementation. The project is to be administered in partnership with local financial institutions and environmental protection bureaux. Technical assistance in conducting assessments will be provided in part by Chinese experts trained during the project described above.

CHAPTER III Recommendations

WBCSD's recommendations to industry

The WBCSD calls for co-operation, partnerships or alliances between business, governments, NGOs and others to develop the economic, regulatory and political frameworks within which innovation is stimulated. This will allow companies to deliver more value and performance with fewer resources and less waste, and result in greater business efficiency.

The transition to eco-efficiency is a step-by-step process. The following recommendations can help business start the process of reform.

- ✓ **Company culture**: top management should adopt a business vision of eco-efficiency and translate it into action. Key to success is the involvement of employees at every level in order for them to promote the concept to suppliers and customers. Creating a corporate culture of eco-efficiency also means that each employee takes full product responsibility and considers its entire life cycle in all decisions. This is a prerequisite for shared responsibility.
- ✓ **Training**: industry has a role in training the professionals in industry, starting with its own employees, and also the general public.
- ✓ **Reconnaissance**: identifying threats and opportunities that may affect business. Managers must understand that the earth is finite, its capacity for recovery from excessive resource use is limited, and pressures to modify business behaviour will increase. These constraints will remain a fact of life, and therefore business has to anticipate these challenges by applying environmental criteria 'from the laboratory into the market'.
- ✓ **Management tools**: a number of them, such as environmental assessment, life cycle analysis, environmental accounting methods, can help business identify and select opportunities for improvement.
- ✓ **R&D for eco-efficiency**: companies should focus harder on reducing the material intensity of goods and services. R&D directed at process change and product improvement can lead to higher-value products and reduced environmental impacts.
- ✓ **Design for eco-efficiency**: design details can make a great deal of difference in terms of energy/material requirements for manufacturing, and for primary and especially secondary use.
- ✓ **Production and eco-efficiency**: companies should pay closer attention to energy use and emissions, for they can bring 'win-win' opportunities.
- ✓ **Purchasing and marketing for eco-efficiency**: by focusing on increased value, companies can influence both customer and supplier attitudes. Adopting specific procurement/purchasing policies requiring suppliers to apply sustainable development practices will avoid companies buying-in waste and subsequent pollution problems.

- ✓ **After-sales service**: companies should recognise that their responsibility and potential liability does not end with a sale, and that after-sales service can even add extra value.
- ✓ **Closing the loop** by extending responsibility throughout the life cycle chain in order to ensure total product and service stewardship.

UNEP's recommendations to governments

While it is industry that implements cleaner production and eco-efficiency, governments play a crucial role in providing the environment that will encourage industry to move ahead. The following policy 'instruments' that have been successfully implemented in various countries can help governments create this cleaner production-friendly environment:

1. Regulatory reform

The task of the government is to continue to improve the existing regulations which include requirements for enhanced environmental performance and implementation of cleaner technology. Therefore, governments need to:

- ✓ encourage 'negotiated compliance' with industry, use general and flexible guidelines, and open dialogue between the regulators (government) and the regulated (industry)
- ✓ assign priority to cleaner production over pollution control by phasing out regulations that may lock industry into the use of specific technologies
- ✓ set new and integrated industrial and environmental regulations that reward those members of industry that are serious about Cleaner Production

2. Use economic instruments

- ✓ include cleaner production in the development of new instruments, such as environmental duties, subsidies, and support programmes
- ✓ eliminate unsustainable under-pricing of water, energy, and other natural resources
- ✓ establish management and technology assistance for Small and Medium Enterprises (SMEs)
- ✓ assist research and development in cleaner processes, products, and services

3. Provide support measures

Two elements inhibit the spread of cleaner production: the concept is not familiar to industry, in particular to SMEs, and when the concept is known, its commercial benefits have not been communicated or appreciated. The following elements can help reverse this trend:

- ✓ provide information to industry on the technical and managerial aspects of applying cleaner production
- ✓ support Cleaner Production Programmes that can help in awareness building, research and development, and improving capacity within government and for industry
- ✓ assist in adapting business and engineering educational curricula to incorporate preventive measures
- ✓ establish technology-transfer assistance schemes

4. Obtain external assistance

Countries with little cleaner production expertise can benefit from external assistance to enhance their own ability to manage technological and managerial changes. These can come in the form of financial aid, transfer of information, technology-transfer, education and training. There is a need to:

- ✓ urge international financial institutions to integrate cleaner production into their lending practices
- ✓ commit national resources (financial and in-kind) to match assistance provided by development and technical co-operation schemes

Obtaining information on policy measures may not be an easy task. UNEP is updating its diskette version of the International Cleaner Production Information Clearinghouse (ICPIC), to be released by the end of 1996, to include information on the use of policy instruments in various countries. This database also provides specific information on industry and technology, such as case studies of actual implementations, publication abstracts, and lists of institutions.

Conclusion

UNEP and the WBCSD believe that business world-wide, in all industry sectors, will be faced with even greater policy challenges and growing public debate as questions of development and adequate resources become the focus of the sustainable development debate.

Although not an end all answer, practices of cleaner production and eco-efficiency are the fundamental building blocks for true sustainable development, including a healthier environment.

Several things must happen if eco-efficiency and cleaner production are both to become integrated in the day-to-day planning and operations of corporations:

- ✓ **government policies** must allow greater flexibility to reach national goals and also provide incentives for commercial performance
- ✓ **business leaders** must champion this behavioural change throughout their corporations
- ✓ **voluntary partnerships** between industry, governments, NGOs, and international organisations must be formed so as to achieve greater progress than each would be able to do alone

The quest by companies for competitive edge and long term survival will continue and the successful implementation of eco-efficiency and cleaner production will contribute to their success. Paramount to success will be the need to shift towards greater responsible consumerism equal to the efficiency gains made by corporations - doing more with less.