



Sustainable Consumption and Cleaner Production

Global Status 2002





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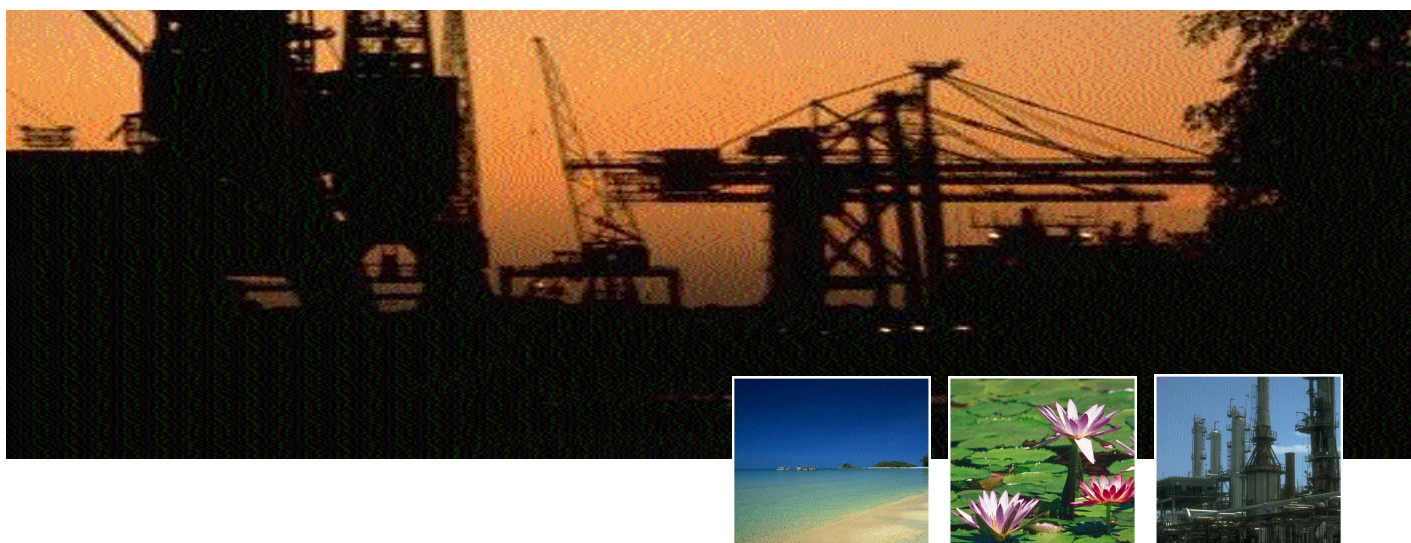
The Sustainable Consumption report was written by Professor Chris Ryan, from RMIT University, Melbourne, Australia, and the Institute for Industrial Environmental Economics (IIIEE), Lund University, Sweden. It was produced for the UNEP Division of Technology, Industry and Environment (UNEP DTIE), under the guidance of Bas de Leeuw, Co-ordinator of the Sustainable Consumption Programme, and Anne Solgaard, Junior Professional Officer, Sustainable Consumption. The author gratefully acknowledges the research assistance of Helen Nilsson of the IIIEE.

The initial draft of the Cleaner Production report was prepared by Prasad Modak and his colleagues, Rahul Datar, Lavanya Karthik, Nagasimha Swami and Mrinalini Patwardhan at the Environmental Management Centre, India. Surya Chandak, Co-ordinator of the Cleaner Production Programme and Garrette Clark under the guidance of Fritz Balkau at the Production and Consumption Branch, managed the project for UNEP.

The reports were presented for review and comment at the 7th International High-level Seminar on Cleaner Production, April 2002 in Prague, Czech Republic, and the Implementing Sustainable Consumption and Production Policies expert meeting, held in May, 2002, in Paris, France. They were placed on UNEP's website and requests for feedback were sent to Cleaner Production centres and other stakeholders. All comments were reviewed and incorporated.

Both reports were reviewed and finalized by UNEP DTIE, under the direction of Jacqueline Aloisi de Larderel, Assistant Executive Director, UNEP. UNEP DTIE extends its appreciation to all those individuals and organisations whose contributions have greatly helped in the preparation of the reports.

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Preface



Fifteen years ago UNEP launched the Cleaner Production Programme. The aim was to promote more efficient use of raw materials, including water and energy, to reduce emissions and wastes at source, and to reduce risks for people and the environment. Cleaner Production applies to production processes and products as well as services. Agenda 21, adopted at the Rio Earth Summit in 1992, clearly referred to Cleaner Production as the way to reconcile economic growth with environmental protection. More broadly, it recognized the need to change our production and consumption patterns.

Since Rio, UNEP has been monitoring progress around the world in the implementation of Cleaner Production and similar approaches such as eco-efficiency or green productivity. The last ten years have seen significant achievements in Cleaner Production and Sustainable Consumption. In the field of Cleaner Production global awareness has been raised, various tools have been developed to help implement the Cleaner Production approach, demonstration projects have been conducted, National Cleaner Production Centres - reflective of capacity building - have been established, an International Declaration on Cleaner Production has been launched and Regional Roundtables are meeting regularly to exchange experience and best practices.

However, it has become increasingly evident that the environmental gains achieved by programmes aimed at Cleaner Production and eco-efficiency are being offset by trends on the demand side -- population growth, an increasing standard of living and individual desires to consume products and services. This is usually referred to as the "rebound effect". Supply--production and demand--consumption are therefore two sides of the same coin, and the challenge we face today is to establish a framework for action in which producers and consumers can move together along the road to sustainable development. Only by adopting a 'preventive' environmental management approach throughout the product life cycle -- product design, manufacture, use and disposal -- can we move towards the objective of delinking economic growth from environmental impacts.

This is why work has also been initiated in the field of Sustainable Consumption. The Life Cycle Initiative has been launched in order to promote and facilitate the use of sound and transparent environmental product criteria, to be used for eco-design and eco-labeling by business and for green procurement by governments. National Cleaner Production Centres are being trained on how to use these demand side tools. With help from the advertising industry, state-of-the-art market research and communication techniques are being developed through UNEP's Advertising Forum. Youth groups are being empowered to take action as well, through the "YouthXchange" website, and a review of national implementation of sustainable consumption policies has been carried out in co-operation with Consumers International. Even so, for all that

has been achieved, much more remains to be done, and as highlighted at the World Summit on Sustainable Development, held in Johannesburg, South Africa in September 2002, *“Fundamental changes in the way societies produce and consume are indispensable for achieving global sustainable development.”*

The Global Status Reports on Sustainable Consumption and Cleaner Production take stock of what has been achieved so far, what lessons have been learnt and propose future courses of action. This publication contains the executive summary of each Global Status Report. The full reports, which contain regional overviews and results from global surveys and activities, are available in CD ROM format from UNEP or can be accessed on the web at www.uneptie.org/pc/cp/library.htm. It is hoped that the information in these reports will be a useful reference for stakeholders engaged in the process of changing the current patterns of production and consumption to more sustainable ones.

The reports launched at the 7th International High-level Seminar on Cleaner Production in Prague in April 2002, provided input to the World Summit on Sustainable Development and will serve as a basis for further follow-up action for tackling global as well as local environmental problems.

UNEP, in co-operation with other UN bodies, is committed to continue to catalyze and contribute to this world-wide effort which to be successful needs the full and active engagement of all partners in government, business and civil society.

Jacqueline Aloisi de Larderel
Assistant Executive Director
Director, Division of Technology, Industry and Economics
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Sustainable Consumption: A Global Status Report: Executive Summary

September 2002

The growing attention to issues of Sustainable Consumption is a natural outcome of decades of work on Cleaner Production and eco-efficient industrial systems. It represents the final step in a progressive widening of the horizons of pollution prevention; a widening which has gone from a focus on production processes (Cleaner Production), to products, (eco-design), then to *product-systems* (incorporating transport logistics, end-of-life collection and component reuse or materials recycling) and to *eco-innovation* (new products and product-systems and enterprises designed for win-win solutions for business and the environment). Action focused on *consumption* has highlighted the need to address the creation of new systems of *production and consumption*, systems that might be truly sustainable, environmentally, economically, systems that will enhance the quality and equality of cultural, social and physical existence for all people.

This report is an overview of action and thinking on the issue of Sustainable Consumption since the publication of *Agenda 21* in 1992. Its focus is the ten years that have elapsed since that publication. Chapter 4 of *Agenda 21* (Changing Consumption Patterns) became the starting point for international work directed to improving understanding of global consumption patterns and their environmental and social impacts. It also led to work, by a number of United Nations and international agencies, on the development of appropriate policies and programmes of action to change unsustainable consumption patterns, and to promote the importance of sustainable and equitable consumption for human development. The United Nations Environment Programme (UNEP) through its Division of Technology, Industry and Economics (DTIE) has played a key role in supporting and stimulating that work through the activities of its Sustainable Consumption Programme. Attention to this topic has also involved meetings, reports and proposals from the UN Commission for Sustainable Development (UN CSD), the United Nations Development Programme (UNDP), Organisation for Economic and Community Development (OECD), and from key non-governmental organisations (NGOs) within business, the scientific community and consumer protection and environment. Consumption-related issues have been addressed by many governments of both developed and developing countries as part of their own environment and resource policies and in response to the programmes of UNEP and the other international agencies.

UNEP has initiated a series of international consultations on the issue in four regions - Africa, Asia Pacific, Eastern Europe and Latin America and the Caribbean and published a report, *Consumption Opportunities*, which made important contributions to strategic thinking about Sustainable Consumption. UNEP recognises that industrialised countries have a special responsibility to promote, facilitate and achieve. However, consuming and producing more efficiently will be fundamental to any successful strategies for eradicating poverty and creating business opportunities in developing countries. UNEP has thus placed great emphasis on promoting the concept for developing countries and countries with economies in transition and developing capacity building programmes, designed to raise awareness, inform and train decision-makers, in governments and (small- and medium-sized) companies. In addition to carrying out consumer trend studies focusing on global consumers and youth, supported by the advertising and communications industry, UNEP has also been reviewing the implementation of a set of Consumer Protection Guidelines specifically related to Sustainable Consumption. These were adopted by the UN General Assembly in 1999 as a specific section of the general guidelines for consumer protection (1985).

The Global Status Report examines progress and the status of the area at the time of the World Summit on Sustainable Development (WSSD) - August - September 2002. It examines whether the issues of concern in 1992 at Rio are still relevant today.

The history of the Sustainable Consumption debate is considered with reference to the key players involved. The outcomes of the UNEP regional consultations and the nature of actions proposed by UN agencies and governments, business, consumers and environment organisations and research institutions are reviewed and future action considered. A number of Industry Sector Reports have been prepared by relevant industry organisations and UNEP for WSSD. These reports review action and development over the last ten years and present the result of consultations on future sector-wide goals. These reports have also provided material for the study.

"Achieving sustainable development will require both efficiency in production processes as well as changes in consumption patterns... in many instances this will require a re-orientation of existing production processes and consumption patterns which have predominantly emerged from developed countries."

- Agenda 21

Development, prosperity, wealth - the economic, social, cultural and environmental factors that underpin our sense of quality of life - are dependent, ultimately, on structure of our systems of production and con-

sumption. However, in the lead-up to the first global conference on the human environment (Stockholm 1972), community, and scientific and political, debates targeted those systems of production and consumption as a potential threat to human survival. The 20-year period from Stockholm to Rio saw huge changes to global understanding of the relationship between economic activity and ecological systems. By the Rio Summit in 1992, there was a sense of optimism that preventative strategies heralded the potential of a 'change of course', in which industrial and economic development would become compatible with sustaining the global environment.

Unsustainable consumption patterns - the inversion of development

A critical review of achievements in pollution prevention, Cleaner Production and eco-efficiency can point to some real progress since Rio. However, whilst some gains are observable in production, consumption patterns appear to be moving in ways that continue to threaten sustainable development. Globally, unsustainable patterns of production and consumption demand attention and action, just as they did in 1992. In particular, there is:

Growing disparities in levels of consumption between rich and poor countries.

- Growing disparities in levels of consumption within developing countries.
- Total growth in consumption of resources (particularly water, food and energy) in developed countries such that technical (eco-) efficiency improvements are being overwhelmed.

Clarifying terms: 'consumption' and 'patterns of consumption'

Discussions of consumption, over-consumption and sustainability are prone to a confusion in terminology between consumption of goods and services (demand and volume) and consumption of resources (ecological impact). The term 'patterns of consumption' has grown in usage as a way of expressing the linkage between these two aspects of consumption and the impact that arises from the consumption of goods and services and the particular ways such goods and services are produced.

The distorted geography of consumption

The inequalities in consumption between countries (and within countries) are so significant that it is of wide concern, representing a fundamental distortion in progress towards sustainable development. The overall consumption of the richest fifth of the world's population is 9 times that of the poorest fifth. There are critical resource areas where consumption levels within countries are threatening future development because demand is exceeding supply. These problems reflect poverty, poor technology, inefficient supply systems, inadequate infrastructure and lack of demand management.

Measuring consumption impacts

Various attempts have been made to translate global consumption and the consumption of populations living in different regions, countries, and cities, into a measure of their environmental impacts. This requires developing sets of appropriate indicators and the measurement and analysis of data.

The distorted demography of consumption

Affluent-society consumption patterns are becoming an observable feature of life within many countries of Eastern Europe and the former Soviet Union, Asia, Africa and Latin America and the Caribbean. These affluent consumers reflect the reality of growing contrasts within developing countries and a distortion in the demography of consumption, a widening gap between rich and poor.



The distortion of improvements in production and products

Preventative approaches to improving production and the performance of products (Cleaner Production, product eco-design, environmental technology, eco-innovation and environmental management) have demonstrated significant environmental gains. Increasing eco-efficiency remains the most optimistic strategy for sustainable production, with strong support from industry. However, there is evidence that GDP is growing at a faster rate than improvements in resource or energy efficiency - *consumption is outpacing the gains from improvements in production and products*. There is also increasing evidence of rebound effects, in which improvements in efficiency actually become a stimulus for increased consumption.

Over-consumption, trade, and competing for 'part of the pie'

Conspicuous consumption in affluent countries is easily attacked for 'taking an unfair share of the pie'. The role of trade, in commodities and resources from developing countries, to support affluent consumption in developed countries, is more complex and nuanced than some of the current debate over globalisation allows for. Consumption in the developed world is a vital source of income and wealth for developing countries. However, it is the case that trade can deplete local resources, removing them from potential consumption, or pricing them out of the market and blocking development.

The global diffusion of affluent 'Western' patterns of consumption

'Scaling-up' current western patterns of consumption as the basis of development for, say, China or India - adding another 2 billion 'western style' consumers - is simply not a realistic option unless the risk of catastrophic collapse of the global ecosystem is considered acceptable.

Western economies have been supported by an entrenched social and cultural commitment to the link between prosperity and per-capita consumption of

goods and services. Through global business, trade, advertising and communications, concepts of quality of life in developing countries are strongly affected by the aspirations and goals of consumers and business in developed countries. The impacts of this 'global aspiration system' are acutely evident in the concerns expressed in regional consultations on consumption and from the UNEP work on the emergence of a Global Consumer Class.

Action on Sustainable Consumption

Since *Agenda 21* these issues of unsustainable consumption have been addressed through a series of meetings, dialogues, research and publications from UN CSD, UNEP, OECD, UNDP and other business, consumer and research organisations. The idea of Sustainable Consumption has been developed and clarified through that process, *emerging as an umbrella term that brings together a number of key issues, such as meeting needs, enhancing quality of life, improving resource efficiency, minimising waste, taking a life-cycle perspective and taking into account the equity dimension; integrating these component parts in the central question of how to provide the same or better services to meet the basic requirements of life and the aspiration for improvement, for both current and future generations, while continually reducing environmental damage and risks to human health. (UN CSD, 1995)*

International Agencies

In defining targets for action and policy implementation, towards Sustainable Consumption there is broad agreement that it must embrace:

- Poverty eradication.
- Change pursued by all countries, with the developed countries taking the lead.
- A mix of policies including regulations; economic and social instruments targeted to land use, transport, energy and housing; information; products and services.
- Partnership between governments, relevant international organisations, the private sector and consumer groups.
- Special attention to unsustainable consumption patterns among the richer segments in all countries.

Industry

Industry (e.g. through the World Business Council for Sustainable Development (WBCSD)) has approached Sustainable Consumption as an extension of eco-efficiency approaches to include a) technological and social innovations to improve quality of life b) provide and inform consumer choice and c) improved market conditions through appropriate legislation and regulation

UNEP's Industry Sector Reports to WSSD demonstrate awareness and attention to the need to reduce resource consumption in production and products and to provide information to consumers, to improve the effectiveness and quality of product use. Reducing end-of-life waste (usually through recycling) is also a common feature of product stewardship programmes across most industry sectors.

Regional concerns

A series of consultations initiated by UNEP in Africa, Asia-Pacific, Latin America and the Caribbean and Eastern Europe have confirmed concerns about the impacts of particular features of global development:

- Poverty and consumption scarcity;
- Population growth;
- Globalisation of information;
- Globalisation of trade;
- Trans-national corporations;
- Intellectual property rights;
- Urbanisation;
- Tourism and
- Consumer Protection.

Towards a more integrated approach to Sustainable Consumption and Cleaner Production: a strategic focus for the future

Thinking about *consumption* has provided a valuable approach to the analysis of current conditions and an important way to structure strategies for future development. There is considerable agreement about actions and policies that must be pursued to bring consumption back from its unsustainable precipice. A critical task is to focus such action in a way that does not lead to a simplistic division into separate spheres of action: *production-focused* (producers, processes, technology facilities) and *consumer-focused* (needs, awareness, behaviour). Thinking about Sustainable Consumption has exposed the limitations of production-focused strategies. Consumption does not provide an alternative approach, just 'the other side of the coin'. It is *systems* of production and consumption which need to change - urgently - and changing patterns of consumption requires an understanding of the complex features of such systems which shape particular modes of living, the markets for goods and services and the means by which they are produced. Any action in developed countries has to be relevant to the conditions and the needs of developing countries and open to solutions and approaches derived from the experience and practice of developing economies. Change will occur only through North-South and East-West dialogue and collaborative projects.

Clarifying the meanings of 'consumption'

Interest in Sustainable Consumption partly reflects a tradition of using consumption as a measure of activity both within economics and environment. A focus on consumption as a measure of systems of production and consumption is obviously both appropriate and valuable. However, another meaning of consumption derives from the substantial literature on consumerism and consumer culture, which tends to portray consumption as the most significant *driving force* of the economy and production. In the context of this voluminous literature, the label 'consumption' can easily be interpreted as singling out the consumer and their behaviour/need/wants as the focus and the target for action and change.

Thus, to the confusion already discussed (economic measure - goods and services; environment measure - resources and waste) there is also confusion over

whether 'consumption' is a system measure, or shorthand for 'consumer behaviour'. These different meanings are evident, for example, in the four strategies for approaching changing 'consumption' proposed in the UNEP *Consumption Opportunities* report - efficient consumption; different consumption; conscious consumption; appropriate consumption. The first two, 'efficient' and 'different' apply to the total system (outcome) of production and consumption; 'conscious' refers to changing consumer attitudes and behaviour whilst 'appropriate' focuses on using consumption as a measure of system performance.

The need for indicators and meaningful feedback

There is a need to develop a better set of measures (such as those proposed by the UN CSD) and to collect data and track aggregate change. There are numerous proposals and publications of alternative measures to GDP which attempt to capture some more complex sense of prosperity and quality of life. Measuring and reporting on quality of life is directly or implicitly called for in many of the strategic actions for Sustainable Consumption. Explicit and comprehensible feedback on quality-of-life conditions would seem (along with consumption-environment-impact data) to be an essential platform for sustainable development. None of the alternative 'green accounting' measures have managed to achieve the status and institutional commitment of GDP.

Industry sectors recognise the need for effective measurement, reporting and data exchange. From the sector reports it is clear that some measures of consumption (energy, water etc) are seen as necessary for effective management and strategic planning for sustainable development.

Feedback can also play a role at the individual or small group (e.g. household) level, where the availability of information (or lack of it) can become a critical factor in changing motivations. There is, for example, simple software that gives individual computer users feedback on the implications of their printing decisions, as a measure of cumulative paper used, which appears as desk-top icons of (percentage of) trees consumed.

An alternative conceptual approach for describing systems of production and consumption

The UN CSD definition of Sustainable Consumption as an 'umbrella term' talks of addressing needs, quality of life, equity, resource efficiency, waste, (environmentally-improved) goods and services. It emphasises changes in patterns of consumption, referring to both the levels of utilisation of goods and services and the way those goods and services are produced and delivered.

An alternative approach is needed which provides a practical way of describing the system (to guide intervention) but allows for more complex modelling of the real world. The Sustainable Consumption literature, examination of various case studies of multi-stakeholder action to shift patterns of consumption, and the range of actions discussed in the report, suggests an alternative approach to describing systems of production and consumption. In this model, the system is

described from three perspectives - provision (the way that goods and services are produced and their systems of delivery and function); motivation (the incentives and disincentives which shape the market for goods and services) and access (factors which include or exclude consumers from participating in the market). These three viewpoints reflect an aggregation of forces, which affect patterns of consumption into three logical areas for analysis and action. They are briefly discussed below.

Systems of provision

This refers to all those processes and infrastructures through which goods and services are made available for consumption. Provision is more than production. It is used to describe the combination of established industry processes and business practices, the accumulated physical production and delivery infrastructure and the corresponding social and cultural practices, which together define the ways in which life-styles and particular sets of products and services become mutually supporting structures. This includes not just all the processes involved in the design, production, distribution and disposal of products and services (along with the necessary technical and organisational infrastructure), but also the shared set of expectations and established practices of consumption that affirm particular categories of products and services as 'necessary' for daily lifestyles to function.

Considering systems of provision means examining the various ways in which the consumption of products and services and the use of resources (and production of waste) associated with that consumption, are determined by structures of creation, delivery, utility, disposal and information. Systems of provision also includes the collective and non-material goods and infrastructure which are not traditionally part of the market but essential to quality of life - such as clean air and fresh water, natural capital, etc. There is a progressive trend, in most developed economies, for many of these previously public, community-held, non-material goods and systems of infrastructure to be transferred to private ownership and control (into the market place). This shift is widely identified as a critical change in systems of provision that affect both consumer motivation and systems of access (increasing individual consumption of private goods and services).

Systems of motivation

Actions and behaviours of people, as citizens, as consumers, as workers and managers, can be attributed to motivations that arise from needs and desires (individual, social and cultural). Traditionally needs/desires are described in general terms as:

- *survival* (biophysical needs and safety, safety and risk),
- *acceptance* (belonging, love esteem, status and power),
- *cognition* (understanding, exploration),
- *aesthetic appreciation*, (appreciation of form and beauty, comfort)
- *self-fulfilment* (personal improvement, stimulation, excitement)
- *transcendent ideals* (concern for others; political spiritual and moral beliefs)

From the Sustainable Consumption literature there is broad agreement on the following aspects of consumer motivation:

- Ultimately all motivations are dependent on information and understanding (of options and implications of action). Information is a key aspect of systems of provision, which affects motivation. (It is also a fundamental determinant of access.) However, as sociological studies show and marketing people know, there is no simple, direct, relationship between information and awareness, and behaviour, which is influenced and modified by other factors.

- Motivations are both individual and socially contingent; they reflect personal concerns and social and cultural influences which are often weighed up in a conscious process. (For example, in deciding whether to use a car or public transport - personal comfort and convenience is weighed against pollution etc.). Social and cultural influences on motivations emphasise that

consumers 'belong' to more than one group (based on kinship, class, age, religion etc) with sets of expressed needs which can be very different. (The UNEP Global Consumer Class survey highlights aspects of the multiple nature of group 'belonging'.)

- Motivations also reflect habits and repeated sets of practices that relate to past experience and established routines. These are often re-enforced by the development of infrastructures.

This is one way that motivations are connected to systems of provision; motivations reflect patterns of behaviours related to patterns of provision. (For example, travelling by car in cities designed without effective public transport).

- Consumer motivations and behaviour are not consistent and stable over time; change can be sudden and rapid. (Use of the Internet is one example.)

Various organisations and reports on Sustainable Consumption have focused on analysing the drivers who lead to 'over-consumption', or the desire to actively acquire and accumulate goods. These are summarised in the appendix. However, it is very important to recognise that (some) consumers do see the connection between consumption and pollution/waste and are concerned about the 'life behind the product'. In particular circumstances, consumers can be motivated by longer-term interests rather than short-term, by collective and social goals rather than individual, and do act to consume responsibly. As the UNEP surveys on Global Consumers and Youth have shown, such behaviour is not limited by region or country.

Analysing the motivations for business to improve environmental outcomes has identified factors such as:

- market competition and 'recognition' of a 'green market';
- long range planning (recognition of trends and potential future risks);
- regulation or potential of future regulation;

- improved relationship with customers;
- individual company personnel desires (to contribute, through work, to socially positive outcomes); and
- protecting "brand" image.

Systems of access

Patterns of consumption reflect systems and structures that control access to the existing market and to processes of influence in shaping the market. Critical factors affecting access include:

- Income. Levels of income either widen or restrict access to the market. This is obviously most critical in conditions of scarcity where poverty is the major barrier. The increasing dependence of consumption on private income (with the reduction in public infrastructure), in all markets, has important implications for access.

- Time. Along with income, conditions of life can make time a critical commodity and an important factor in access - to the market, to information, to political and social process which affect the market - consumer action.

- Availability and ownership of infrastructure of essential goods and services. Provision affects access.

- Availability and choice of products and services (no eco-lifestyles without eco-products and services-WBCSD).

- Information. An absolute determinant of access in all market conditions. Knowledge of goods and services, Knowledge of 'life behind the product'.

- Awareness of quality of life issues with choices.

- Awareness of best practice possibilities.

- Education and training. Along with information, this affects abilities to participate in shaping markets, in the utilisation of opportunities.

Enhancing the potential of limited, localised actions

The complexity of production and consumption systems - provision, motivation and access - can be significant barrier to taking action, with only large global or regional organisations and governments appearing to have the power and resources to tackle the problem. However, there are campaigns of action directed to reducing consumption of particular sensitive resources, or changing the patterns of consumption of specific goods or services, which offer another approach. These campaigns are not well recorded or analysed within the Sustainable Consumption literature, yet they represent a level of action that may have great advantages in terms of involvement and achievable outcomes. Unlike actions and policies intended to shift consumption patterns in whole economies, or which aim to change global conditions, these campaigns of action are often conducted in localised areas - regions, cities, towns, communities. They include such things as: Shifting modes of transport from cars to public transport, creating car free areas, reducing



water consumption, reducing energy consumption, shifting energy consumption towards renewable energy; reducing household waste.

Of course such campaigns are usually limited to dealing with one particular resource, or impact area, and there is always the possibility that proposed solutions will exacerbate consumption problems in another area. They do, however, reflect an awareness of the need to address consumption-related impacts and they have the advantage of local(-ised) action that makes the engagement of multiple stakeholders more realistic. With the development of indices such as eco-footprints and improved monitoring of consumption patterns and impacts, there is the potential for such action to widen to a more-holistic approach. Case studies of localised campaigns could be the basis of research to examine total life-cycle changes resulting from campaigns for specific reductions in consumption, as well as providing an opportunity to test the appropriateness of indices for use at the community and regional level.

Improving products and services - the logical focus for production and consumption

Products and services form the link between production and consumption. Production systems deliver products and services to the market; it is these products and services that are consumed; it is the volume of their consumption, and the efficiency (in environmental terms) with which they are produced and used, that is the critical issue. Products and services define systems of provision; they play a major role in systems of motivation; the range of products available affects systems of access.

In the decade since *Agenda 21*, products (and services) have become an increasingly important area for government policy, as analysis and practical experience in industry has demonstrated that:

- Environmental impacts from products has continued to rise (in gross terms) relative to impacts from production processes.
- A life-cycle perspective on the environmental impacts of a product 'captures' the whole production-consumption chain.
- 60-80% of the (life-cycle) environmental impacts from products are determined at the design stage.
- When product-related environmental-impacts are made explicit in the design process, there are well tried design strategies for reducing them.
- A focus on products is a good way to engage company interest and action because it focuses on their core business.
- The existence of new eco-designed products changes the market, projecting a new 'demand space' for product competition.

A focus on the creation of sustainable products and services, if considered from a life-cycle perspective, results in changes to both systems of production and patterns of consumption. 'Well tried' eco-design strategies, developed for managers and designers in companies, tend to stress the technical and engineering aspects of such work (the use quantitative life-cycle analysis, the optimisation of material use, the development of simple and reversible fasteners, the selection

of recycled materials, the selection of technically efficient components, etc). However, in practice, these technical production issues only partly shape the outcome. Other factors enter the process, factors which play an increasingly important role in the creation of value and which reflect the complex forces that shape patterns of consumption.

Products are not just enablers of change, as the WBCSD argument would suggest. The history of product design in industry since the Second World War demonstrates that designed products have played an increasingly central role in the shaping of consumption. Through the design process and with the increasing technical sophistication of the manipulation of materials, consumer products have become symbols of possibilities and potentialities as much as objects of function and utility. They are designed to motivate consumers, to create desire for ownership and possession, to communicate value, identity, status, enjoyment and fulfilment.

"The process by which design incorporates ideas is by no means direct... [M]anufacturers filter and distil ideas and add some of their own, all with the intention of making their products seem more desirable..., successful design is like alchemy: it fuses together disparate ideas from different origins, so that the form of the completed product seems to embody... a single idea..."
Adrian Forty, *Objects of Desire - design and society since 1750*

The availability of new eco - products and services in the market affects the structures of provision and access and, as a result of the increasing sophistication of design; they also become an important motivational force for change. Any recyclable, water-saving, solar energy, package-free products that exist in a competitive market must have been designed to attract consumers, to create desire (to consume these objects rather than competing ones). Such products have the potential to re-shape consumer desires, behaviours and ideas of satisfaction and quality.

Production-focused strategies (Cleaner Production, process redesign) have a solid history of achievement and established infrastructure. Consumption issues have drawn attention to the limits of such strategies and there are clear calls for the integration of action on Cleaner Production and Sustainable Consumption. The development of new eco-products and services in developing countries is seen as a way of eradicating poverty and advancing sustainable development. The improvement of products and services through eco-design and the creation of a policy framework conducive to such development (e.g. the EU's Integrated Product Policy) is a logical and easily communicated focus for integrating Cleaner Production and Sustainable Consumption.

The overall strategic goal: leapfrog to new systems of products and services

The creation of sustainable systems of production and consumption is increasingly viewed as a process that will depend more on a radical restructuring of exiting

systems (including products, services, lifestyles, business and measures of economic value) than on incremental improvement. In the desire to communicate the idea of change as a real discontinuity another term has come into use - Leapfrog change.

"For developing countries, Sustainable Consumption does not mean not consuming. It means quite the contrary, namely leap-frogging. Sustainable Consumption will bring new business opportunities."
Jacqueline Aloisi de Larderel, Assistant
Executive Director, UNEP

For developing countries, leapfrog changes in systems of production and consumption, products and services, in developed economies, offer the possibility of a 'development path' which will link economic development with Sustainable Consumption. Leapfrog transformations of production and consumption systems will require changes in all aspects of systems of provision, motivation and access. This is therefore not only a technological change in the narrow sense, it will have to encompass changes to patterns of living, the balance between private and collective-community ownership of resources and infrastructure, shifts in values and behaviours.

Summary - future strategies and action

A number of things stand out from a review of the past ten years' work on Sustainable Consumption:

- Progress towards Sustainable Consumption has to emerge from industrialised countries, where the dominant models and aspirations for patterns of consumption are generated. New aspirations for sustainable prosperity need to be widely and visibly embraced within developed countries if they are to become a global pattern.

- Action in developed countries has to be relevant to the conditions and needs of developing countries and open to solutions and approaches derived from the experience and practice of developing economies.

- Thinking about consumption has provided a valuable approach to the analysis of current conditions and an important way to structure strategies for future development. This has exposed the limitations of production-focused strategies. Consumption does not provide an alternative approach, just 'the other side of the coin'. It is systems of production and consumption that need to change - urgently.

- 'Production' and 'Consumption' is a limited way of thinking about systems of production and consumption. Other approaches are needed. Strategies for change will succeed or fail on the way that these complex systems can be focused into action that can be communicated, understood and embraced by all stakeholders.

Six strategic areas are discussed which address various problems in current work on Sustainable Consumption. Taken together, they aim to bring about a greater integration of Sustainable Consumption and

Cleaner Production. They are:

- Clarifying the various (and often confused) meanings of the term consumption.

- Developing better feedback - indices to measure consumption pressure and quality of life, and putting them to use.

- Finding a more appropriate conceptual schema for describing systems of production and consumption, to allow for more complexity of elements and interactions but still simple enough to assist analysis and intervention.

- Supporting and enhancing localised campaigns of action to transform consumption of targeted resources or goods and services.

- Focusing production and consumption-oriented action on the transformation of products and services.

- Developing and promoting the idea of 'leap-frog' change as a radical shift in existing product, services and business sectors.



Cleaner Production A Global Status Report, September 2002

Evolution of Cleaner Production

In 1987, the concept of sustainable development was proposed to steer *Our Common Future*. In theory, sustainable development implies meeting the needs of the present generation, without compromising the needs of future generations. The true challenge of sustainable development was how to put the theory into practice. Cleaner Production provided a practical way to take clues from the conceptual framework of sustainable development towards action. It was more of a preventative strategy and not a curative or reactive approach to address the global pollution problem.

Cleaner Production is not a new concept. It is a logical extension of the desire to conserve materials and reduce waste. It requires people to examine ways that result in increased productivity, reduced resource inputs and waste and, most importantly, reduced risk to the environment. Cleaner Production is not just an environmental initiative; it supports other productivity-oriented programmes and strategies.

In 1992, Cleaner Production found mention at the Rio Summit as an important strategy to take forward the concept of sustainable development. *Agenda 21* made significant references to Cleaner Production and has in fact served as a guiding framework for the implementation of Cleaner Production. It also provided a direction and focus to the adoption of Cleaner Production on a multi-stakeholder and multi-partnership basis.

The UNEP DTIE's Cleaner Production Programme was launched in 1989. The immediate task then was to create awareness of the concept, build institutional capacities and demonstrate its benefits to foster sustainable development. Today, Cleaner Production is a flagship programme of not just UNEP DTIE, but also of several organisations in the world that have adopted and adapted it. It has truly become a global movement.

The emphasis on Cleaner Production today is more on action and the establishment of an enabling framework embodying the spirit of partnership.

What has been accomplished?

In the last ten years, Cleaner Production has attempted a paradigm shift in environmental management at the level of governments, business and financing institutions, as well as local governments and communities.

However, there have been a number of barriers in the promotion and adoption of Cleaner Production, encompassing various issues such as problems in

communication, resistance to change, lack of appropriate demonstrations of Cleaner Production to prove its benefits, inadequate training, and a lack of Cleaner Production-related information and problems in accessing cleaner technologies. Other critical barriers include the lack of financing and, more significantly, a lack of Cleaner Production orientation in the national policy and regulatory framework.

Typically, the progression of Cleaner Production mainstreaming in a country has followed a strategy of moving from awareness creation to capacity building of institutions, and to implementation throughout manufacturing and service organisations. As a next logical step, with the help of the key institutions, and by working in partnership, Cleaner Production is implemented within all other sectors to increase its acceptance. For a multiplier effect, information-sharing mechanisms are then instituted by holding seminars, publishing manuals, conducting training and operating websites. To develop an enabling framework, suitable financing mechanisms and policy instruments are devised. Based on in-organisation experiences and consultations with important stakeholders, reforms are then undertaken to mainstream Cleaner Production in the national policy and regulatory framework.

Some of the major highlights of the above achievements are summarised below.

Raising Awareness

Spreading awareness of the Cleaner Production concept through examples has been one of the major strategies towards improving both acceptance and understanding of Cleaner Production across a wide range of stakeholders. Numerous seminars and workshops have been conducted, and the development and distribution of brochures, posters, and videos has been done. In many cases, Cleaner Production is communicated through other programmes and strategies such as eco-efficiency, green productivity etc. Some of the innovative approaches include Eco-Accounting Books in Japan, the 'Miljøhjemmevernet' programme launched in Norway for households and the Eco-efficiency Calendars for Small and Medium Enterprises (SMEs) developed by the Wuppertal Institute in Germany in collaboration with UNEP.

Obtaining Commitment

Obtaining a commitment is an essential step to ensure moving from awareness to action. The International Declaration on Cleaner Production (IDCP) has been an excellent step to obtain commitment of a large number of stakeholders at various levels including national governments.

The IDCP is a voluntary but public commitment to the strategy and practice of Cleaner Production. This Declaration was launched at the 5th International High-Level Seminar on Cleaner Production, held at Phoenix

Park, South Korea in 1998. As of September 2002, the IDCP has over 350 signatories and has been translated into 15 languages.

Building National Capacities

Recognising a need to set up model institutions on Cleaner Production at the national level, UNIDO and UNEP launched a National Cleaner Production Centres (NCPC) Programme. There are now 22 NCPCs set up with the assistance of various donor agencies. Many international donors, notably the Swiss Government, the International Labour Organisation, NORAD, USAID, the World Bank, and the Global Environment Facility (GEF) have identified NCPCs as highly competent partners for delivering their programmes and projects on the national level.

Taking the lead from NCPC Programme, several Cleaner Production Centres (CPCs) have been set up by many countries by allocating national funds and in some cases drawing assistance of donor agencies. There is currently a global Cleaner Production network of more than 100 CPCs operating in about 40 countries. Today this network is a global alliance demonstrating a partnership among international agencies, national governments, financing and developmental institutions, business associations, environmental NGOs and academia.

Demonstrating Cleaner Production

More than 1000 demonstration projects have been launched to convince industrial leaders of the economic and environmental benefits of Cleaner Production. Sectors where most of the demonstrations were performed have been textiles, pulp and paper, metal finishing and tanneries.

After the success in projects such as PRISMA in the Netherlands, Landskrona in Sweden, SPURT in Denmark, AIRE/CALDER and Catalyst in the UK, etc some trend-setting demonstration projects have been implemented. These include DESIRE in India (implemented by National Productivity Council, New Delhi with support from UNIDO), ProduksiH in Indonesia (implemented by the BAPEDAL under support of GTZ), and SEAM in Egypt (implemented by EEAA with the support of DFID, UK). Multi-country demonstrations supported by agencies such as the Asian Productivity Organisation (APO), Tokyo under Green Productivity Programme, US AID under the EP3 project, World Environment Centre (WEC) and World Cleaner Production Society (WCPS) have also been noteworthy.

Information Networking

Cleaner Production has been one of the major themes of discussion at the regional and international arena. A momentum to international efforts focusing on Cleaner Production was given by UNEP DTIE through its High-level Seminars on Cleaner Production. Across all the regions, several roundtables are now operated on Cleaner Production. Prominent amongst these include the National Pollution Prevention Roundtable (NPPR) in the US and the European Roundtable on Cleaner Production (ERCP). The NPPR operated a number of

P2 roundtables in the US and also in Mexico. The Asia-Pacific region has organised three Cleaner Production roundtables. Apart from holding Cleaner Production roundtables, the Mercosur region has proposed the formation of a Cleaner Production network. The African region has initiated the regional consultation process by organising Roundtables on Sustainable Consumption and Cleaner Production 2000 and 2002. Most of these roundtables are now operating websites.

The experiences of Cleaner Production networking, world-wide, catalysed several other agencies and programmes to set up their own Cleaner Production networks. Many of the themes for networking shared a common vision to Cleaner Production. Examples include the Greening of Industrial Networks, International Green Productivity Association (IGPA), O2 International Network of Sustainable Design, CDG's Latin American Network, Canadian C2P2 network, O2 international network of sustainable design, PREPARE for Europe etc.

UNEP DTIE developed the International Cleaner Production Information Clearinghouse (ICPIC) that has information on technical and policy sources of information. Other important web-based initiatives on Cleaner Production include the International Cleaner Production Co-operative launched by US Environmental Protection Agency, and the websites of Environment Australia, the Chinese NCPC and the Canadian Centre for Pollution Prevention.

Working in Partnerships

Cleaner Production is not an activity that is best done in isolation. This decade therefore witnessed a gradual movement from individual approaches to Cleaner Production to common or collective approaches that are based on partnerships. The partnership models have taken different innovative forms of collaboration among diverse stakeholders. Consequently, there are numerous success stories and lessons learnt.

Some of the examples of innovative partnerships include the Victorian Environment Improvement Plan Programme in Australia, the Asia-Eco-Best Programme promoted by the EU, the Waste Minimisation Circles in India, Waste Minimisation Clubs in South Africa, the UK and New Zealand, the Corporate Synergy System in Taiwan and ECOPROFIT in Austria.

Education and Training

In 1994, the UNEP Working Group on Education & Training and COMETT UETP-EEE (University Enterprise Training Partnership in Environmental Engineering Education) prepared an international inventory on Cleaner Production education activities. This inventory indicated that there was an increase in the number of courses offering Cleaner Production within economic and business curricula and that there was an increasing trend towards introducing specialised courses around Cleaner Production such as eco-balances, environmental accounting and environmental management. Number of technical courses within engineering curricula where preventive environmental concepts can be integrated, (e.g. courses on

energy, combustion processes, product development and industrial production), had increased. The analyses showed that there were 119 Cleaner Production courses and 147 Cleaner Production training programmes operated by 104 institutions across the world.

In the last decade, some institutions in Australia, Denmark, Sweden, Norway, United Kingdom and the United States have set up Cleaner Production programmes at the graduate level. There are about 50 undergraduate / graduate -level Cleaner Production education programmes world-wide. Similar to train-the-trainer initiatives, the International Institute for Industry, Environment and Economics (IIIEE) conceived the "Educate-the-Educators" programme to build capacities of the faculty members around the world in preventive environmental education. A more recent trend has been to set up web-based resources and distance education programmes related to Cleaner Production.

There has also been an emergence of professional journals dedicated to Cleaner Production such as *Journal of Cleaner Production* and *Journal of Industrial Ecology*. Publication houses specialising in Cleaner Production have also come about such as Greenleaf Publishing. This shows increasing demand and circulation of Cleaner Production-related research and application materials.

The need for training activities in building environmental awareness cannot be overstated, more so in the case of Cleaner Production promotion. The train-the-trainer approach has been proven to be a very important strategy. One of the excellent illustrations of this approach is the Norwegian Cleaner Production Capacity Building Programme. The Programme was initially conducted entirely by Norwegian expertise, but was progressively taken over by the Association of Managers for Cleaner Production (AMCP) in the Czech Republic and by the Polish Cleaner Production Centre NIF-NOT in Poland. The National Productivity Council in India has launched a facilitator training initiative through the programme on Waste Minimisation Circles.

Technology Development and Co-operation

An upcoming impetus to the cleaner technology market is now evident due to some of the multilateral environmental agreements such as the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes (The Basel Convention); the Stockholm Convention on Persistent Organic Pollutants (the POPs Convention); and the UN Framework Convention on Climate Change. Several sectoral institutions have established initiatives to promote adoption of cleaner technologies in their own sectors by setting up business to business web sites, sponsoring technology development projects and by organising thematic trade fairs.

Increased foreign direct investments in developing countries have led to some cleaner technology adaptations. Eco-labels, in particular, have been one of the prime push factors in sectors such as textiles, leather tanning, metal finishing, food and pulp and paper. This has fostered substitution and elimination of hazardous chemicals and processes leading to Cleaner

Production interventions along the supply-chains.

There have also been efforts on promotion of cleaner technologies on regional bases. Examples are the Asia Pacific Centre for Technology Transfer (APCTT) in New Delhi, the Centre for Environmentally Sound Technology Transfer (CESTT) in China, the International Centre for Environmental Technology Transfer in Japan and the Ecolinks initiative operated by USAID for Central Eastern European countries.

Financing Cleaner Production Investments

One of the critical elements of the Cleaner Production enabling framework is the existence of financial support with adequate mechanisms that are designed to promote Cleaner Production-related investments across various sectors. Recognising this need, a number of innovative Cleaner Production financing programmes have been operated in various parts of the world. These include the NEFCO Revolving Facility set up by the Government of Norway in Russia, Lithuania, Latvia and Estonia that has documented considerable success. In the Latin and Caribbean Region, the Multilateral Investment Fund (MIF) has recently introduced a major cluster financing programme on achieving ecoefficiency through Cleaner Production and Environmental Management.



The United States has demonstrated the most innovation and maturity in its financial sector. Several states in the US have pollution prevention, recycling, or revolving loan fund programmes. Examples are the P2 Loan programme of Ohio State that targets small-to medium-sized businesses, the RENEW Loan Programme in Colorado that emphasises waste recycling or the Nebraska Dollar and Energy Saving Loan programme that promotes small projects for "turning pollution prevention and energy efficiency into corporate assets".

In the last decade, development financing institutions such as the World Bank have set up several Cleaner Production-related Technical Assistance and Financing Programmes. Notable among these are the Industrial Pollution Control and Prevention Project (IPPP) of the World Bank in India, the Industrial Pollution Control Project in Brazil and in China. The World Bank publication, the *Pollution Prevention Abatement Handbook - Towards Cleaner Production* is used by several financing institutions today, to assist in project appraisal.

There are however, still a substantial segment of extremely small businesses and entrepreneurs who fail to qualify for these institutional mechanisms. To respond to such a need, the UNEP DTIE started a four-year project in 1999 on Cleaner Production Financing. This project aims at increasing investments in Cleaner Production in developing countries by helping leaders at financial institutions understand the importance of Cleaner Production and by helping Cleaner Production experts develop creditworthy investment proposals. The project, focusing on five demonstration countries - Guatemala, Nicaragua, Tanzania, Vietnam and Zimbabwe - operates under a trust fund created by the

Norwegian government. The results obtained and lessons learned in the demonstration countries will be used at the global level to motivate key decision-makers in the financial sector to pursue Cleaner Production investments in developing countries.

Development of Cleaner Production-oriented Policies and Strategies

A number of countries have made progress, albeit to varying extent, in applying a mix of instruments for promoting Cleaner Production. Markets have started influencing both production and consumption by building awareness through eco-labels, establishing environmental and social codes for products throughout the supply-chain and by developing and implementing environmental management systems. This has provided an overarching framework for a more integrated approach to Cleaner Production, encompassing process, product, services and consumption.

More recently, countries mainly in the North Atlantic (notably the US), the European Union (EU) region (notably Denmark, Netherlands, and Spain), Norway and Australia have placed an emphasis on reforming the legislative framework, stressing the promotion and recognition of voluntary instruments - especially Cleaner Production. The European Union has already established the Industrial Pollution Prevention and Control (IPPC) Directive and many of its member states are in the process of aligning their national Cleaner Production-related policies and strategies with the IPPC.

One of the steps taken in the EU to increase the focus of Cleaner Production on products and related markets, was the development of an Integrated Product Policy (IPP). Some EU Member States have already developed, or are developing Environmental Product Policy (EPP) frameworks. The leading countries, thus far, are The Netherlands, Denmark, Sweden, Austria and Germany. EPPs are also beginning to emerge in countries such as Belgium, the United Kingdom, Finland, Italy and the U.S.



On the supply-side, the leading countries have developed a number of measures to encourage eco-product development, such as the product-oriented environmental management systems (POEMS) in The Netherlands, eco-design grants and awards and product take back and recycling requirements. These countries are also developing demand-side tools, such as eco-labels, product taxes and green product public procurement policies. The most advanced are also exploring multi-stakeholder dialogue tools (such as Product Panels in the Denmark) to bring both sides together to work toward greener products.

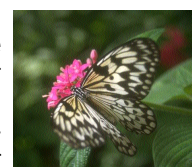
One of the publicly developed and discussed illustrations of a national Cleaner Production strategy is that of Australia and of the Czech Republic. Chile and Columbia provide good illustrations of Cleaner Production-related policies in the Latin and Caribbean region. The Asian Development Bank is supporting

several Regional Environmental Technical Assistance Programmes for the Promotion of Cleaner Production Policies and Practices in Selected Developing Member Countries. Cleaner Production strategies are not limited within the national networks. The Asia-Pacific Economic Co-operation (APEC) formally adopted a Cleaner Production strategy in 1997.

Findings of the Regional Overview

There are differences in the adoption of Cleaner Production in various regions of the world, given the differences in the social, economic and political systems. For instance, there are regions where Cleaner Production is already being mainstreamed into the national policy and regulatory framework, while there are regions or countries where Cleaner Production is still in the initial stages of development.

The regional overview reveals a disconnect between the achievements made in Cleaner Production and the existing situation of the enabling environment. In some regions, for instance, the enabling environment is rather weak and is plagued with significant barriers while at the same time, many Cleaner Production-related initiatives are reported. It may be therefore concluded that the Cleaner Production sector is still not matured across the region and/or the Cleaner Production interventions are less mainstreamed or strategic and are limited to project/programme level interventions. This observation is applicable to Africa, Asia-Pacific, Centre and Eastern Europe (CEE) and Latin and Caribbean (LAC) regions. For regions such as the European Union and the North Atlantic (NA), such a disconnect is not observed and the interrelationship between the enabling environment and the accomplishments in Cleaner Production seem to be rather well structured and harmonious. More research is required into the enabling environment, and its influence on Cleaner Production promotion in the different regions needs careful assessment.



The regional review also shows differences in the context and opportunities for accelerating the implementation of Cleaner Production. The drivers for Cleaner Production implementation are indeed different. Cleaner Production activities should focus on identifying key drivers that will enable greater penetration. It is important to understand that these drivers may differ for each region, and this must be factored into processes for developing region-specific Cleaner Production action plans.

The global market for environmental technologies and services differs in the diverse regions and by composition is still influenced by end-of-the-pipe treatment technologies. By 2008, it is estimated that the US and EU countries will have nearly 70% of the global market share. If Cleaner Production is to be promoted around the world, then the market must shift and change in composition, promoting Cleaner Production solutions ahead of end-of-the-pipe approaches. This will require creation of enabling environments in all regions of the world.

The African region needs to focus more on the agricultural and natural resource management sectors, integrating health and safety in the Cleaner Production approach and stressing the interrelationships between Cleaner Production and Sustainable Consumption. The Asia-Pacific region needs to focus on supply-chain models to influence Cleaner Production in the SMEs and take up the infrastructure and service sectors as priority sectors for Cleaner Production interventions. There is also a need in the Asia-Pacific region to convince the national governments towards mainstreaming Cleaner Production in their policies and regulations. The LAC region can be an excellent pilot to demonstrate relationships between Cleaner Production and the MEAs, given the commitments to MEAs in the region and the strong presence of regional trade associations. There is a great need however, to build Cleaner Production skills in this region. The CEE region has taken a lead in Cleaner Production financing and mainstreaming Cleaner Production in policy and regulations and it is important that the experiences are shared with other regions. Energy efficiency seems to be the principle-driving concept in the CEE countries. The EU and NA regions have played a key role in initiating and developing the Cleaner Production concept and in promoting its implementation around the world through Overseas Development Assistance (ODA). It is therefore important that ODA moves to more strategic interventions on Cleaner Production rather than continuing to provide assistance on a project-by-project basis. There are already signs of such changes. Finally, the private sector, financing institutions and communities seem to be distanced from the global Cleaner Production network. Efforts are needed to widen the network and establish multi-level partnerships with these important stakeholders.

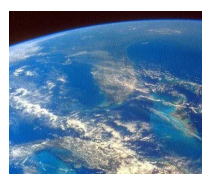
What should be done?

Despite the progress made in the last decade, on Cleaner Production, much more still remains to be done. In the last decade, several strategies have been deployed to overcome some of the barriers. However, not all strategies have worked and some issues still remain to be resolved. Indeed, some of these issues are not new; and have been discussed in conferences and workshops around the global Cleaner Production network. Nevertheless, these issues are critical and must be addressed if Cleaner Production is to be strengthened, mainstreamed and maintained.

Products and services form a critical link between Cleaner Production and Sustainable Consumption. If these two concepts are to be strengthened, then there is a need to acknowledge this link by expanding the scope of Cleaner Production in practice to include Sustainable Consumption. **A formal integration between Cleaner Production and Sustainable Consumption may provide a concurrent framework that guides producers and consumer behaviour on lines more aligned with the long-term objectives of sustainable development.** Both the Malmö Declaration and the Millennium Summit endorse such a concurrent framework.

Cleaner Production has helped inspire implementation of preventive thinking. The all-pervasive nature of

Cleaner Production has enabled a wider dissemination of its core message across the world, albeit in multiple forms, depending on local interpretation. But in doing so, Cleaner Production promoters did not establish a formal Cleaner Production system, or a common standard approach. Given the establishment of several other overlapping and competing programmes, systems and strategies today, the discrete potentials of Cleaner Production still remain unclear. **Cleaner Production promoters must establish, document and communicate the Cleaner Production implementation principles and processes that can be commonly understood and applied across all sectors and by all stakeholders.**



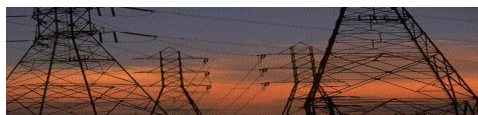
It is critical to strengthen the global standing of Cleaner Production, by driving it through overarching policies and agreements that are endorsed internationally. The IDCP has been an excellent step towards obtaining the commitment

of a large number of stakeholders at various levels including national governments on Cleaner Production. The implementation guidelines brought out by UNEP are the first step towards drawing up a plan to actively facilitate the implementation of the IDCP. In such efforts, **it may be strategic to establish a synergy between Cleaner Production and implementation of various Multi-lateral Environmental Agreements (MEAs) at the national level.** The key needs are therefore, to move towards more synergy and mobilisation between national and regional implementing and co-ordinating agencies for MEAs and the Cleaner Production network world-wide.

The establishment and operation of CPCs/NCPCs has been one of the major steps for facilitating dissemination and implementation of Cleaner Production in the last decade, and demonstrates a true capacity building and partnership approach. **It is important to expand the vision and agenda of the CPCs/NCPCs and to equip them with skills to run the Centres like Strategic Business Units and for them to establish models and approaches for future CPCs/NCPCs to follow.** To achieve this objective, the CPCs/NCPCs must be adequately positioned to mainstream Cleaner Production in national policies and regulatory framework. In addition, it is necessary that CPCs/NCPCs operate in close partnerships with the financing institutions, technology development agencies and consumer based environmental NGOs. **CPCs/NCPCs should focus now on the expanded vision of Cleaner Production that links explicitly with Sustainable Consumption. CPCs/NCPCs should also start playing a proactive role in assisting local and national governments, businesses and communities to implement the various MEAs.**

The concept of Cleaner Production germinated in the manufacturing sector. **Given the global shift of economies to services and infrastructure, there is now a need for a corresponding shift in Cleaner Production focus as well.** While this has been achieved to some extent in the hospitality sector, much work still needs to be done in other sectors, especially those engaged in natural resource management, services and infrastructure.

The potential of Cleaner Production has been proven beyond any doubt via demonstration projects in diverse industrial sectors. Despite their good intent, the multiplier effect of demonstrations has been very poor. Again, in most of the cases, demonstration projects are understood more as demonstrations of equipment or technology, not of methods and management systems or innovative partnership. **It is important to transform the character, scope and mechanism of demonstration projects to foster multiplication. Focus should be on systems and on life cycle thinking, and not merely on technical retrofitting.**



Information exchange is important and several such initiatives have been taken world-wide through diverse information clearinghouses. However, most of these information clearinghouses have been supply driven and little work has been done to actually assess and to stimulate the information demand related to Cleaner Production. The quality and depth of content of Cleaner Production information clearinghouses in some cases could be questionable. Most information databases have tended to restrict themselves to the manufacturing sector and its needs. Information compilation must address issues of sustainable consumption; as the links with sectors such as services and infrastructure, and resource management runs very deep. **Future, Cleaner Production information networks will have to move from information to knowledge, and support field-based counselling units, especially to meet the needs of the SMEs.** Networks should not remain mere conduits of generic information; there is a need to offer customised assistance to individual stakeholders, as a value addition on the information provided. Including local Cleaner Production expertise into networks thus becomes essential.

A fair amount of economic activities related to small-scale manufacturing and services are rural. These activities are critical from the protection and management of natural resources as well as to sustain livelihoods of the rural communities. This aspect, however, has tended to get overlooked, in most Cleaner Production initiatives. Cleaner Production appears more as an urban affair. **Rural innovation, in agriculture, dairy farming, mining, forestry and fisheries are still vibrant traditions in many regions and must to be fostered by strategic Cleaner Production interventions. There are also innovations made in recycling and reuse of wastes in urban areas, particularly in the informal sector that warrant some attention.** Indigenous innovations are the most sustainable as they best address local situations and in turn may be closely linked with sustainable consumption patterns.

Consumer health and safety remain under-addressed issues in many developing countries. **Cleaner Production could provide an excellent platform to address minimisation of health and safety-related risks while meeting the market demands of codes of conduct, brands and eco-labels.** Here the consumer interest organisations, trade unions and local governing authorities could play vital roles in demon-

strating the economic and environmental benefits of Cleaner Production approaches.

SMEs are the mainstay of many of the regional economies where there is a need to initiate technology development and co-operation. **In this regard, supply-chain based approaches may be more useful as they are driven through economy and competition, and will help to ensure participation of medium and large scale enterprises and can be more intricately linked with trade, health and safety.**

Private sector participation is a key element, and must be exploited for greater outreach across sectors, as well as in building multiplier effect of Cleaner Production. Trade fairs can be influential avenues for information exchange and interactions between people of diverse expertise, and have conventionally under-emphasised Cleaner Production, despite its relevance in the promotion of technology that is resource, or energy efficient. The business to business (B2B) interactions in Cleaner Production must be catalysed to both widen and deepen the Cleaner Production market. This may lead to increased Cleaner Production-related consulting, and engagement of performance related contracts.

Cleaner Production as such does not fit neatly into any one educational discipline. **As a foundation to mainstream Cleaner Production and to ensure that it influences all the stakeholders, inclusion of Cleaner Production concepts is necessary in all forms of education.** Unlike demonstration projects and industry based awareness programmes, Cleaner Production training in universities has traditionally received little investment from multilateral or international aid agencies. Further, these courses are currently developed and supported entirely by the university, with little or no involvement of local NCPs or any other facilitating organisation.

The institutionalisation of Cleaner Production must be formalised through education, and development of specific training programmes culminating in certification, to build a credible accredited pool of Cleaner Production expertise. A Cleaner Production Certification will provide a strong boost to developing a mature market for Cleaner Production. **Cleaner Production implementation would be accelerated if it were stressed through the national policy framework, as in the case of mandatory Cleaner Production assessments for critical aspects of appraisal and risk analyses.**

Most financing activities have somehow not focused on widening outreach to small enterprises, services and local utilities, perhaps due to the high credit risks involved. Private sector participation in Cleaner Production-related financing is rather low and most fund streams are donor driven. **Further, Cleaner Production must to be integrated in the standard project appraisal process as well as in the risk management framework when it comes to retrospective financing or operation of cluster loans.**

Programmes of financial assistance should be refocused to emphasise technology uptake and building of local capacity. Cleaner Production is indeed an initiative that is best promoted in partnerships. In the last

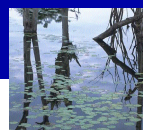
decade, a commonly established partnership for Cleaner Production promotion has been between government-donor agencies and businesses. Many of these partnerships have, however, been limited to programmes or projects, and usually whither away on the withdrawal of, donor support. **It is critical that we build local level multi-stakeholder partnerships that can promote Cleaner Production on a self-sustaining basis. The increased role of the private sector and the community is necessary to ensure 'ownership' and on-going support of integrative, multi-stakeholder Cleaner Production implementation programmes.**

Much of the experience in Cleaner Production implementation has been in existing or given situations, to find means to improve environmental and economic performance through optimisation, modernisation/expansion or reengineering/reorientation. Cleaner Production has been relatively less used in developing land-use related and operational plans for guiding project siting and development, deciding on natural resource extraction or building infrastructure to support mobility, energy supply and human settlements. **If Cleaner Production is to influence future development, and then it is necessary that Cleaner Production principles be explicitly integrated into planning and related anticipatory environmental management tools.**

At the policy level, the presence of subsidies on natural resource extraction, as well as poor legislative enforcement will continue to hinder Cleaner Production absorption. Strategic interventions at the policy level must be made to enable greater success of Cleaner Production promotion. In the past few years, focus has been placed on the formulation of national policies and strategies, and the orientation of regulatory frameworks for promotion of Cleaner Production. Here, experiences from countries and regions such as Columbia and Chile, EU, the Czech Republic and Australia have been encouraging. The use of innovative policy instruments and a mix of regulation have been evolving but these initiatives are restricted to developed economies. It is important that these initiatives are further documented and applied within other developing countries.

Finally, many of the strategic interventions described above are interrelated and should not be independently considered. To develop and implement a Cleaner Production action plan, it will be necessary to establish a situation specific operational framework by involving stakeholders, identifying needed pre-requisites and overcoming barriers.

An expanded charter of Cleaner Production along with Sustainable Consumption will perhaps show the way - by obtaining commitments at all levels and by establishing new partnerships between government, business and communities - to take forward the agenda of sustainable development.



ABOUT UNEP'S DIVISION OF TECHNOLOGY, INDUSTRY AND ECONOMICS

The mission of the UNEP Division of Technology, Industry and Economics (UNEP DTIE) is to help decision-makers in government, local authorities, and industry develop and adopt policies and practices that: are cleaner and safer; make efficient use of natural resources; ensure adequate management of chemicals; incorporate environmental costs; and reduce pollution and risks for humans and the environment.

UNEP DTIE, with its head office in Paris, is composed of one centre and four branches. It focuses on raising awareness, improving the transfer of information, building capacity, fostering technology co-operation, partnerships and transfer, improving understanding of environmental impacts of trade issues, promoting integration of environmental considerations into economic policies, and catalyzing global chemical safety.

ABOUT THE PRODUCTION AND CONSUMPTION BRANCH

The Production and Consumption Branch works with international agencies, industry associations, and institutes to promote global awareness and understanding of sustainable production and consumption by:

- addressing key industry sectors with high environmental and safety impacts;
- assisting environmentally sound technology transfer through information exchange, capacity building, and the development of sound environmental management procedures in industry;
- ensuring the integration and co-ordinated implementation of industrial issues in environmental conventions and agreements; and
- establishing and maintaining international expert networks and linking with technical and policy bodies in key industry sectors.

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