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BACKGROUND PAPER

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CLEANER PRODUCTION AND SUSTAINABLE CONSUMPTION: STRATEGIES TO IMPLEMENT MULTILATERAL ENVIRONMENTAL AGREEMENTS

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1. The Need for Cleaner Production

“The world is undergoing accelerating change, with internationally-coordinated environmental stewardship lagging behind economic and social development”, Global Environmental Outlook 2000 concluded. More efficient, fair and responsible use of natural resources by the production sectors of the economy, change towards more sustainable patterns of consumption, and more equitable use of resources by the entire world population is the only way to slow further environmental degradation¹.

It has become progressively more clear that “end of pipe” strategies alone cannot resolve complex environmental problems. They do not eliminate pollution, but often transfer it from one media to another; require expensive pollution treatment equipment; discourage technological innovation toward achieving environmental benefits beyond compliance; and hinder stakeholders' dialogue.

Cleaner Production (CP) is an overarching concept for flexible preventative strategies. It aims to prevent pollution from occurring and manage environmental impact of the whole production process, not just impacts of its output. Cleaner Production addresses *the root causes* of environmental problems, rather than their *effects*, through an integrated package of improvements at all stages of a process and product life cycle. Cleaner Production therefore eliminates or minimises the very need for costly abatement, treatment and disposal systems – integral parts of conventional end-of-pipe environmental protection strategies. Moreover, it encourages innovation and stakeholder dialogue, eliminates trade-offs among environment and economic growth, and ensures consumer and worker safety.

More specifically, Cleaner Production aims to reduce the consumption of natural resources per unit of production, the amount of pollutants generated, and their environmental impact, while making alternative products and processes financially and politically more attractive². As the European Environmental Agency states, *“Cleaner Production is about the creation of a truly sustainable economy”*.³ Cleaner Production brings economic benefits via increased resource efficiency, innovation and reduction of pollution control costs.

The most important ways for achieving Cleaner Production are:

- Changing attitudes (finding a new approach to the relationship between industry and the environment and re-thinking processes or products in view of prevention approach)
- Applying know-how (improving efficiency, adopting better management techniques, changing housekeeping practices, revising policies, procedures and institutions as necessary)
- Improving technology (i.e., redesigning products, changing manufacturing technologies).

¹ Global Environmental Outlook (2000). Available: <http://www.unep.org/Geo2000/english/index.htm>.

² Asian Development Bank (2001). Guidelines for Policy Integration and Strategic and Action Planning for the Promotion of Cleaner Production, Prepared by Richard S. Stevenson.

³ European Environmental Agency (2001). Website:
http://service.eea.eu.int/envirowindows/ii_2_1.shtml#top.

Box 1 Definition of Cleaner Production

The United Nations Environmental Program defines Cleaner Production as “the continuous application of an integrated preventive environmental strategy to processes, products, and services to increase overall efficiency, and reduce risks to humans and the environment. Cleaner Production can be applied to the processes used in any industry, to products themselves and to various services provided in society.

For production processes, Cleaner Production results from one or from a combination of measures conserving raw materials, water and energy; eliminating toxic and dangerous raw materials; and reducing the quantity and toxicity of all emissions and wastes at source during the production process.

For products, Cleaner Production aims to reduce the environmental, health and safety impacts of products over their entire life cycles, from raw materials extraction, through manufacturing and use, to the 'ultimate' disposal of the product.

For services, Cleaner Production implies incorporating environmental concerns into designing and delivering services”.

Partnership among all actors and sectors is crucial for effective adoption of Cleaner Production. All actors in society gain from application of Cleaner Production as a win-win strategy, and all actors have important roles to play in adopting Cleaner Production, including government, industry, civil society, educational facilities and non-governmental organisations.

Box 2 Impacts of Cleaner Production

Cleaner production as a set of tools, as a program and as a way of thinking has had significant impacts. These impacts can be assessed at various levels:

First, Cleaner Production has been a technology promoter. At their simplest level Cleaner Production programs have advanced more resource intensive and less hazardous production technologies. Aqueous cleaning, powder coatings, solvent recycling, non-cyanide plating, counter-current rinsing, lead-free soldering, water-based paints, vegetable-based dyes and bead-blasting strippers are all physical ramifications of many Cleaner Production initiatives.

Second, Cleaner Production has been a managerial catalyst. Cleaner production has liberated environmental values from the dungeon of residual management and regulatory compliance and placed them nearer the centre of product and process design. Environmental performance is increasingly considered as an important management system that needs to be optimised along with management systems for quality and financial return.

Third, Cleaner Production has been a paradigm reformer. The conventional economic view of environmental protection located pollution control investments as a business cost. By promoting full cost accounting and green marketing, Cleaner Production has restructured environmental economics, converting environmental protection investments into productivity benefits. Environmental values have proven to add to, not subtract from, economic performance.

Finally, Cleaner Production has been a conceptual bridge connecting industrialisation and sustainability. Since the Brundtland Commission and the United Nations Conference on Environment and Development, the concept of sustainability has been enshrined as the global vision for a healthy future. Cleaner production has allowed industrial production to find a place in this vision by recasting negative images of polluting industrial processes into positive images of materials conserving, energy efficient, non-polluting and low-waste technologies, which produce ecologically friendly products that are responsibly managed throughout their life cycle.

Source: Van Berkel P. (2000). Cleaner Production Perspectives for the Next Decade: Proceedings of the 6th High-Level Seminar on Cleaner Production, 16-20 October 2000.

The benefits of Cleaner Production are well proven. However, the potential of Cleaner Production to improve effectiveness of international environmental regimes remains largely untapped. Cleaner production can be more broadly integrated into global environmental protection efforts and improve the effectiveness of MEAs by helping to address environmental, social and economic problems, encouraging sustainable changes in production and consumption patterns, and providing a basis for synergies among MEAs.

2. Cleaner Production Initiatives Worldwide: National Cleaner Production Centres Network

A global network for promoting Cleaner Production world-wide has been created by efforts of UNEP and UNIDO. Starting from 1994, joint UNIDO/UNEP National Cleaner Production Centre programme has been facilitating establishment of the National Cleaner Production Centres (NCPCs) as mechanisms for delivery of Cleaner Production at national level. To date, 22 NCPCs have been established under the UNIDO/UNEP programme⁴. In addition, a number of Cleaner Production Centres have been set up under different bilateral/local initiatives.

NCPCs have become national centres of excellence for Cleaner Production in developing countries and economies in transition. Acting as focal points for Cleaner Production, NCPCs extend the global network to partners in their countries - like productivity councils, non-governmental organisations, chambers of industry, universities, etc. This extensive network with its wealth of information and expertise allows the NCPCs to provide much better services to companies. NCPCs draw on a global pool of institutions that specialise in Cleaner Production.

The skills and capabilities of NCPCs depend on their age and level of maturity and thus vary from country to country. NCPCs are established in credible local host institutions and are run and managed by country professionals. The unique feature of such a set-up is its ability to deliver Cleaner Production solutions tailored to local conditions.

Many international donors, including The International Labour Organisation, NORAD, the World Bank, the Global Environment Facility (GEF) have identified NCPCs as high competent partners for delivering their programs and projects on the national level.

The key advantages of the NCPCs are:

- their excellent rapport with local industries, governments and academia and other stakeholders;
- their ability to adjust and adopt environmental strategies to suit the local conditions, the culture and manufacturing practices of their country; and
- the support of national and inter-NCPCs networks of qualified professionals.

The core activities of the NCPCs are:

- awareness raising,
- technical assistance,
- training and demonstration projects,
- information dissemination, and
- policy advice.

These core activities of the NCPCs match the implementation mechanisms of the MEAs. Their strategy of advising and enabling their clients to find the best solutions for their specific problems rather than delivering ready-made solutions also goes well with the objectives of MEAs and the desire of most countries to determine themselves the best solutions for their individual circumstances.

⁴ For detailed information on NCPCs please refer to the UNIDO website: www.unido.org

3. Multilateral Environmental Agreements and Cleaner Production

A new model of international environmental governance must be predicated on the need for sustainable development that meets the inter-related social, economic and environmental requirements. The environmental problems of today can no longer be treated in isolation, but are inextricably linked to social demands, demographic pressures and poverty in developing countries, counterposed against excessive and wasteful consumption in developed countries. In addition any approach to strengthen international environmental governance must command credible universal commitment and ownership of all stakeholders, an undisputed authoritative basis and adequate, stable and predictable funding.

International Environmental Governance. (2001). Report of the Executive Director, UNEP

3.1 Multilateral Environmental Agreements

Multilateral environmental agreements (MEAs) are the main instrument of international environmental protection. In the present context, the MEAs refer to international legal instruments concluded between a large number of states or international organisations as parties in written form, and governed by international law, whether embodied in a single instrument or in two or more related instruments, with the goal of environmental protection.⁵

As a response to the global environmental change, a large number of environmental agreements have been created. Earlier MEAs were usually dealing with one or another single issue of environmental protection, primarily addressing allocation and exploitation of natural resources. The modern generation of environmental agreements is more holistic, system oriented and trans-sectoral.⁶ This new generation of MEAs was spurred by the UN Stockholm Conference (1972), when the people realised that industrialisation and economic development were posing an ever-increasing threat to the global environment, and that solving complex environmental problems have to address multiple aspects of interaction of society and environment. The United Nations Conference on Environment and Development (UNCED) in Rio (1992), was another important landmark for the new generation of MEAs. The Conference adopted the Rio Declaration and Agenda 21, documents that set out principles and action plan for sustainable development. Two UNCED Conventions (the Convention on Biological Diversity and the Framework Convention on Climate Change) were first agreements that clearly established interdependence of socio-economic development and environmental protection.

All of the core MEAs (the MEAs of global significance whose negotiation, development and/or activities have been associated with UNEP's work) are legally binding instruments. MEAs can be either self-contained conventions (working through annexes or appendixes) or operate as the *framework* conventions that can develop protocols for addressing specific subjects requiring more detailed and specialised negotiations.

MEAs have varied priorities and objectives, but they all share a common goal of sustainable development: "The objectives and priorities of MEAs vary significantly from one agreement to another, even within a cluster. The common aspects include the sustainable development focus of the three Rio Conventions (CBD, UNCCD and UNFCCC), the sustainable use of natural resources and the environment, or the protection of the environment in such a way as to ensure its sustainable use. None of the core environmental agreements are exclusively oriented to protection and conservation.

The institutional elements of MEAs adopted after 1972 include the following elements: Conference of Parties, a secretariat, a number of executive and subsidiary bodies, a clearinghouse mechanism, and a financial mechanism (see Box 3).

⁵ Based on definition for a term "treaty" from UN Treaty Collection, UN Treaty Reference Guide.

⁶ Global Environmental Outlook (2000). Available: <http://www.unep.org/Geo2000/english/index.htm>.

Box 3 Main institutional elements of Multilateral Environmental Agreements.

Conference of Parties (COP). It is the ultimate decision-making body on the overall implementation and development of their respective MEAs, including the work programme, budget, and adoption of protocols and annexes

- Secretariat. The Secretariats perform a number of varied functions depending on the mandate of a MEAs. There are two types of the Secretariats: those that prepare and service the meetings of COPs and co-ordinate with other international organisations. (e.g. The Montreal Protocol, Convention on Biodiversity, The Stockholm Convention, the Rotterdam Convention); and the Secretariats that, in addition to, the functions of the first type, perform scientific research, and/or are also involved in implementing programmes or projects at the regional and country levels (e.g. The Basel Convention, the Global Program of Actions on Land-Based Sources of Pollution);
- Executive and subsidiary bodies. Some MEAs established standing committees or hold inter-sessional meetings that represent their COP/MOP, to review and advise their Secretariats on implementation. Subsidiary bodies, which are generally advisory in nature, report to COPs/MOPs on scientific, technical, or financial matters or on progress in implementation. They may be internal or external, and be standing bodies or ad hoc, with a limited mandate.
- Clearinghouse mechanisms are generally operated by secretariats to facilitate exchange of scientific, technical, legal and environmental information. A few conventions have established regional centres for training and technology transfer, or to assist in implementation.
- Financial mechanisms. Most MEAs are funded via voluntary contributions. Financial mechanisms include:
 - Regime Budgets. MEAs can establish one or more trust funds, administered by the international organisations that provide the Secretariats. Budgets are proposed by Parties and approved by the COPs.
 - Development Assistance. Funds can be provided via foundations (e.g. UN Foundation), bilateral arrangements, private sector donors and NGOs.
 - Other multilateral financing mechanisms (e.g. the Global Environment Facility, The Kyoto Protocol climate-related mechanisms, the World Bank).
- Implementation bodies on the national level, depending on mandate and design of an MEA, can include designated national authorities, focal points, training and other centres with specific functions.

Most MEAs are not self-executing and are implemented via national legislation and regulatory measures. It is important to appreciate the meaning and difference of three key concepts pertaining to MEAs: implementation, compliance and effectiveness. Domestic *implementation* of MEAs is “a long term process of converting international commitments and behavioural change of target groups, i.e. those actors causing the problem in question”. Often, however, it is understood more narrowly as a process of converting MEA's requirements into national legislation. *Compliance* with treaties goes beyond implementation in its narrow sense and refers to whether the countries in fact adhere to the agreements provisions, and to the measures that countries have undertaken, including procedural measures (e.g. national reporting) and substantive measures (e.g. actual elimination of persistent organic pollutants - POPs). There is a clear distinction between compliance with an MEA and compliance with national measures put in place to meet MEA requirements. Finally, *effectiveness* of an agreement, in its broad sense, means whether a MEA has been able to resolve the problem that caused its creation.

The important cross-cutting implementation mechanisms of modern MEAs include, inter- alia:

- Technical and financial assistance to Parties or member states to meet their responsibilities under MEAs;
- Assessment and management of pollution;
- Education and awareness;
- Information exchange;
- Strengthened participation of all stakeholders in the decision-making;
- International partnership.

It is recognised that modern MEAs also face several common challenges. Those challenges include: the need to, *inter alia*, improve synergies among MEAs; ensure adequate implementation and co-ordination of MEAs at national level; develop adequate mechanisms for compliance and enforcement and environmental and performance indicators to measure the effectiveness; and ensure that adequate financial and human resources are available for implementation.

MEAs are important tools for fostering global commitment to resolve global environmental issues. However, the overall effectiveness of MEAs that have been in effect for quite some time, in attacking crosscutting and cross-boundary environmental problems remains rather low. One of the reasons is that implementation of many MEAs over-relies on conventional end-of-pipe approaches based on controlling the impacts of pollution *after* the pollution has been generated. Cleaner Production can help to find ways to meet those challenges and explore new opportunities via preventative strategies.

3.2 Sustainable Development as a Shared Goal: Cleaner Production and Multilateral Environmental Agreements

Sustainable development, as a shared goal of all MEAs, requires not only widened participation in MEAs and improved compliance, but also synergy between MEA objectives and social and economic demands. Cleaner Production, as a strategy for improving environmental performance while bringing economic and social benefits, is closely linked to the goals of international environmental governance via the key principles of sustainable development set out in the United Nations Rio Declaration on Environment and Development (see Box 4). Cleaner production policies are also stressed as important means of achieving sustainable development in Agenda 21, adopted at the UN Conference on Environment and Development (1992).

Box 4 Principles of Sustainable Development as a link between Cleaner Production and MEAs

Multilateral Environmental Agreements	Principles of Sustainable Development	Cleaner Production
	Equal developmental and environmental needs of present and future generations	Prevents environmental problems from occurring in present and in future Ensures development needs are not compromised
	Environmental protection as an integral part of the development process (Principle 4);	Achieves environmental improvements while simultaneously bringing economic and social benefits Offers policy-making tools and strategies to incorporate environment in all sectoral policies Provides strategies and tools to achieve environmental improvements while increasing competitive advantages at national and individual enterprise level
	The reduction and elimination of unsustainable patterns of production and consumption (Principle 8, Rio Declaration)	Minimises waste yields, improves efficiency of use of natural resources; Encourages use of renewable resources; Closes material cycles; Improves energy efficiency Encourages innovation toward dematerialization of products and services.
	Development, adaptation, diffusion and transfer of new and innovative technologies (Principle 9)	Offers long-term, multi-sectoral strategies for promoting economic growth based on clean industries and new clean technologies Offers comprehensive methodologies for integrated assessment of sustainability of new technologies
	Participative approach in dealing with the environmental issues (Principle 10)	Provides strategy and tools to bring together the interests of the private and public sector Improves relationships among environmental decision-makers and business by offering shared benefits
	Effective environmental legislation (Principle 10)	Suggests strategies and tools to create effective policies encouraging sustainable business and other sectoral practices
	Precautionary approach (Principle 15)	Offers practical preventative strategies for implementing the precautionary approach
↓		
SUSTAINABLE DEVELOPMENT		

3.3 Prevention as the best strategy for effective MEAs.

The notion that prevention is better than cure is fully applicable to global environmental protection.

The important common ground between international environmental law and Cleaner Production lies in the precautionary approach (Principle 15 of the UN Rio Declaration). It states “*when there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation*” and emphasises the need for preventative measures. Both Cleaner Production and the precautionary approach call for the alternatives (both methods of production and products) which permit the termination or minimisation of inputs into the environment and for long-term, holistic economic considerations, accounting for, among other things, environmental degradation and the costs of pollution treatment.⁷

Cleaner Production, as a strategy for the practical application of the precautionary approach, is of key importance for the implementation of international agreements. The preventative approach embodied in Cleaner Production can help to reach objectives of most, if not all, MEAs, ranging from conventions on chemicals to the biodiversity-related treaties. The best guarantee for protecting environment and human health from hazards associated with wastes and chemicals is to prevent the generation of wastes and emissions in the first place, rather than regulate their disposal and require clean-up efforts and measures. The best way to minimise biodiversity loss is to prevent unsustainable use of natural resources by changing consumption and production patterns, rather than by attempts to restore disrupted ecosystems.

⁷ Hey E. (1992). *The Precautionary Concept in Environmental Policy and Law: Institutionalising Caution*, Georgetown International Environmental Law Review, Rev. 303, 305.

Box 5. Sources of dioxin/furan and examples of prevention options.

Sources of pollution	Examples of preventative measures
<p>Polyvinylchloride plastic, chlorine-based paper bleaches, pesticides, and chlorinated solvents are likely the most important causes of dioxin emissions from the sources listed below. When these materials enter industrial and other chlorine-related processes they become chlorine donors to tan organic matter and cause dioxin synthesis.</p> <p>Manufacture processes: Processes in which chlorine or chlorine-containing material (though the latter is not that harmful) is essential. The route of release to the environment is through products, materials, and wastes and liquid/solid/gaseous residue from waste treatment.</p> <ul style="list-style-type: none"> • Pulp and paper (elemental chlorine bleaching) • Chlorinated chemical production: (synthesis of chlorinated aromatic chemicals, chlorinated solvents, polyvinylchloride, other aliphatic organochlorines, some inorganic chlorides) • Oil refining and catalyst generation <p>Product application/use. Processes in which chlorine or a material containing chlorine is used for specific purposes:</p> <ul style="list-style-type: none"> • Pesticides/herbicides • Preservatives of wood, leather, textiles • Textile and leather dyeing, especially using chloranil and textile finishing, • Industrial bleaching processes • Solvent use and processes which involve solvents (e.g. dry-cleaning, degreasing, etc) • Water and wastewater disinfection <p>Thermal processes: In these processes chlorine or chlorine-containing materials are not introduced for any intended purpose but are incidentally present. Source of chlorine – organochlorines. Presence of catalysts: copper, iron, aluminium is especially favourable for dioxin/furan formation:</p> <p>Thermal processes:</p> <ul style="list-style-type: none"> • Metallurgical processes, primary and secondary (recycling) processes, incl. copper, steel, aluminium, zinc. • Coke production and carbo-chemical processes • Mineral processing (especially cement kilns), asphalt mixing, production of lime, ceramic, glass, brick and other similar processes. <p>Controlled combustion processes:</p> <ul style="list-style-type: none"> • Waste incineration (incl. hazardous, municipal, industrial, medical/cleaning) • Coal combustion • Oil combustion (large volumes) • Landfill gas/biogas • Crematorium and animal carcass burning <p>Uncontrolled combustion (biomass combustion; accidental fires; plastic container/barrel burning, etc).</p>	<p>The most effective preventative measures are those aimed at eliminating the chlorine-based materials via product and process re-design.</p> <ul style="list-style-type: none"> • Search for alternative process/product • Substitute free chlorine with other bleaching agents in pulp and paper production <p>If chlorine is present in the process, avoid:</p> <ul style="list-style-type: none"> • High process temperatures (over 130C) • Alkaline extraction steps (purification) • Presence of radicals • Presence of UV light • Manufacture of chlorine with graphite electrodes <ul style="list-style-type: none"> • Switch to the new chlorine-free products and processes • Use procurement policies to encourage production of the chlorine-free products, including textiles and paper • Change input materials: untreated wood, degreased metals • Change synthesis pathway (chloranil from hydroquinone) • Avoid UV light, radicals, alkaline extraction steps • Establish closed cycles (effluent-free) <ul style="list-style-type: none"> • Seek alternatives to polyvinylchloride products • Change feed/input material • Reduce waste volumes, e.g. increase reliance on reusable medical waste • Move to alternative processes of treating waste (e.g. autoclaving for the medical waste) • Prevent products containing polyvinylchlorides from entering the waste incinerators <ul style="list-style-type: none"> • Ensure adequate equipment design (temperature, time, and turbulence). • Ensure adequate operation and maintenance (good combustion practice, operation as designed) • Train personnel with respect to understanding the implications of operating procedures • Modify the existing equipment if needed • Avoid spills and accidental releases

Cleaner production tools could also be used to assess the infrastructure and capacity building requirement from the point of view of implementability of the preventative solutions. Particularly, cleaner technology (or environmentally sound technology) assessments could be used to determine the technical assistance needs and to further facilitate technology transfer (see Box 6).

Box 6. Environmental Technology Assessment

In 1993, UNEP DTIE launched a new program on Environmental Technology Assessment (EnTA). The EnTA Manual and Primer were published in 1995 and have since been used in a variety of international workshops, and several studies concerning different industrial technologies. The work is in part based on earlier experience with Technology Assessment in several national jurisdictions.

Environmental Technology Assessment (EnTA) is an analytical tool, designed to ensure that decision making processes related to technology adaptation, implementation and use are sustainable. EnTA promotes the use of technology assessment to encourage Cleaner Production and discourage the use of hazardous technologies and the unsustainable production and consumption patterns they perpetuate. The assessment process looks at the costs of the technology, the monetary benefits, and its environmental, social and political impacts.

The goal of EnTA is to assist in making informed choices on technologies that are compatible with sound environmental performance; through the use of EnTA more information is gained about new technologies and potential environmental problems and costs can be identified and avoided from the outset.

The key elements include:

- Description of the technology – the goal it intends to satisfy, the stakeholders, characteristics of the technology, etc.;
- Assessment of the environmental pressure and impacts of using the technology – resource, labour, infrastructure and supporting technologies required;
- Evaluation of environmental risks and the significance of the impacts, including societal impacts;
- Comparative assessment of alternative technologies, supporting technologies, and impacts;
- Evaluation of societal descriptors and trends;
- Recommendations on technology choices.

More conventional analytical tools such as Environmental Impact Assessment (EIA) and Social Impact Assessment (SIA) fail to address issues at the higher tiers of decision making, while the EnTA, a flexible, informal approach to technology related decision making is well positioned to fill this gap.

Existing knowledge on cleaner processes or products could help to set realistic objectives for implementing a convention in partnership with the industry. Cleaner Production indicators and benchmarks could be developed and used in the prioritisation criteria. They could help to focus the attention of industry and other stakeholders on preventative strategies, and emphasise the possibility of reaching economic objectives while complying with conventions.

Cleaner Production Centres could help in elaborating Best Available Techniques (BAT) and Best Environmental Practices (BEP) suitable to local conditions. The Czech Cleaner Production Centre has worked for adaptation of the European Union Integrated Pollution Prevention and Control (IPPC) Directive at national level (see Box 7). The implementing actors of the Convention could use this tested approach for the goals of the Convention. The NCPCs could perform similar work for the Basel and Stockholm Convention to respond to the needs for analysis of current situation in regard to waste generation and dioxin/furan emissions.

Box 7. BAT Concept for the Czech Republic

In 1998, the Czech Cleaner Production Centre (CPC) participated in the project "Implication of the IPPC Directive and the BAT Concept for the Czech Republic". Based on analysis of the current practices in the Czech Republic and using experience of EU countries, CPC proposed an approximation programme for Best Available Techniques in the Czech Republic. As a follow up CPC participated in the preparation of Czech IPPC law in 1999. CPC is being considered to play the role of Czech IPPC office.

Presently CPC works on the project 'The Indicators of BAT and their Statistical Monitoring'. Main parts of the projects are:

- analysis of the current status of BAT in the Czech Republic based on the current environmental monitoring channels used by the state administration.
- analysis of the suitable environmental indicators for identifying BAT
- monitoring of environmental performance of two selected industrial sectors, (pulp and paper, cement industry)
- Gather data from the pilot company for permitting process simulation
- comprehensive guidelines for BAT for improving environmental parameters of industrial operators.

Source: Czech National Cleaner Production Centre: <http://www.cpc.cz/eng/index2.htm>

Policy expertise on preventative environmental strategy, on barriers to pollution prevention and ways to overcome them is another contribution that Cleaner Production Centres could deliver. The range of policy work implemented by the Hungarian National Cleaner Production Centre illustrates the potential of the Cleaner Production Centres to assist in policy development under the conventions. (Box 8).

Box 8. Hungary Cleaner Production Centre: Environmental and industrial policy advice

Environmental policy advice has been one of the strategic areas of the operations of the Hungarian Cleaner Production Centre, backed by its host institution - the Department of Environmental Economics and Technology. A number of environmental policy studies have been prepared during the last four years, while representatives of the HCPC have played an important role in national environmental policy organisations.

Based on this accumulated experience of the HCPC, a policy guide was prepared for the UNIDO in the first half of 2000, describing the most important economic considerations of Cleaner Production supporting policies and the possible set of tools available to governments fostering preventive environmental solutions.

The most important policy research papers prepared during the period from 1998 to 2001 include:

- "Hungary's Green Path to the EU. Summary and progress report" (1998),
- "The indirect costs and benefits of greenhouse gas limitation: Hungary case study" (1998), "The mitigation of CO₂ emissions in Hungary and the accession to the EU" (1999),
- "Evaluation of environmental management practices of Hungarian Companies" (1999), "Elaboration of a macroeconomic index incorporating environmental changes – the calculation of the Genuine Progress Index for Hungary" (1999),
- "Integration of Cleaner Production principles and environmental management systems in Small and Medium Sized companies" (1999),
- "Integration of Cleaner Production principles and environmental management systems in Small and medium Sized Companies" (2000),
- "Cleaner Production policy best practice manual" (2000)
- "Analysis of proposed Hungarian regulation for Council Directive 96/61/EC on Integrated Pollution Prevention Control" (2001),
- "Analysis of Social and economic Impacts of the introduction of the European Union's EMAS Directive in Hungary" (2001).

Source: Hungarian Cleaner Production Centre. (2001). Website: <http://hcpc.bke.hu>

The implementing actors of the conventions could utilise the experience of Cleaner Production institutions in delivering effective training, creating information exchange and distribution channels, facilitating cleaner technologies transfer, raising awareness via demonstration projects etc.

Cleaner Production practitioners could also render to the implementation bodies of the Convention the knowledge of local conditions, the strong liaisons and recognition by industry and other stakeholders and expertise in delivering tailor-made Cleaner Production solutions. These advantages have been demonstrated in the Project on "Transfer of environmentally sound technology to reduce transboundary pollution in the Danube River Basin". This project can be used as a model for the expeditious transfer of technology to reduce dioxin/furan emissions.

Box 9. Transfer of environmentally sound technology (TEST) to reduce transboundary pollution in the Danube river basin

The main goal of the project “Transfer of Environmentally Sound Technology To Reduce Transboundary Pollution in the Danube River Basin” is to facilitate the implementation of the Danube River Protection Convention (DRCP). The Convention came into force in 1998. It commits countries in the Basin to reduce transboundary pollution in the Danube River Basin and the Black Sea.

The project was developed as a result of consultations with the main stakeholders: the Secretariat for the Protection of the Danube River, Country Programme Co-ordinators for the Danube River Protection Convention, National Cleaner Production or Pollution Prevention Centres in the five participating countries and United Nations Industrial Development Organisation. The project is implemented by UNDP and funded by GEF within its “International Waters” focal area.

The goal of the project is to build capacity in existing Cleaner Production institutions to apply the UNIDO's Transfer of Environmentally Sound Technology (TEST) procedure to 20 pilot enterprises that contribute to transboundary pollution in five countries of the basin: Bulgaria, Croatia, Hungary, Romania and Slovakia, signatories to the Convention. Those 20 enterprises are among 130 industrial polluters identified as the major sources of pollution in the Basin.

The TEST procedure is a combination of analytical tools, including industrial management, environmentally sound technical assessment, sustainable enterprise strategy, environmental management systems, investment negotiations, enterprise viability analysis.

The TEST procedure has the following advantages:

- It identifies the least costly path to compliance with environmental norms.
- The application of Cleaner Production often changes the perspective of the type of EST needed to come into compliance with environmental norms. The change is usually a less costly configuration of EST than originally envisaged before application of the TEST procedure.

The expected outcomes of the project include:

1. Establishment of a TEST focal point at the National Cleaner Production Centres in the respective countries;
2. Achievement of a significant reduction (at least 30%) of discharge of transboundary pollutants into the Danube River and the Black Sea by twenty pilot enterprises in the five selected countries;
3. Development of a Sustainable Enterprise Strategy by all pilot enterprises. It will include plans for the implementation of best available techniques and best environmental practices needed to integrate EST into their production processes, as well as negotiated environmental compliance schedules, business plans, and social action commitments;
4. Identification of the environmentally sound technology options for three-quarters of the 20 enterprises;
5. Sharing of the experiences of 20 pilot enterprises on how to implement the TEST procedure to other enterprises in the Danubian countries
6. Publication of a TEST management toolkit including technical manuals and 20 case studies.

The strategy to achieve the project goal includes:

1. Establishment of TEST focal points in the National Cleaner Production or Pollution Prevention Centres. These units already have the necessary management and office support to carry out the project
2. Application of TEST procedure in 20 enterprises:
 - Selecting enterprises and securing their commitment to participate
 - Training of TEST teams in analytical techniques (Cleaner Production, environmentally sound technology selection, sustainable enterprise strategy, etc) that constitute TEST
 - Applying the TEST procedure to the enterprises in order to identify the least-cost solution for complying with water-related and other environmental regulations and norms.
3. Dissemination of results:
 - Publishing information materials for the TEST procedure
 - Hosting national seminars in each of the countries
 - One-day assessments of the enterprises to show them potential benefits of applying the TEST procedure
 - Introducing the TEST procedure to the other enterprises in six Danubian countries in a regional workshop

Source: GEF website: www.gefweb.org

3.4 Issue Linkage and Positive Incentives for Compliance.

Integration of Cleaner Production into international environmental agreements could assist countries who want to, but are unable to comply. It could as well provide incentives to countries to re-examine the costs or/and priority given to compliance. It therefore helps to improve effectiveness of implementation by offering ways to link goals of international environmental governance to the social and economic benefits at the national level.

The lack of political will to participate in global and regional international agreements is often rooted in the perception that the costs of environmental protection could slow down economic development by diverting limited financial resources from areas that are more important from the point of view of the local population. Indeed, when implementation of MEAs relies mainly on end-of-pipe solutions, associated high costs of abatement technologies and administration can hamper economic development. In the 1970s-80s, prior to adopting preventative policies in industrialised countries, investments in pollution control in industrialised countries were more than 5% of total industrial investment.⁸

The issue of linkage between environment and development can be more successfully resolved if Cleaner Production becomes a core strategy for implementing MEAs, because it fosters economic development while simultaneously improving environmental performance (Box 10).

Increased use of Cleaner Production-based strategies for implementing MEAs would provide national and local authorities with important, presently often missing⁹, *positive* incentives to work toward MEAs goals. “Emphasising gains resulting from wiser resource management and the ways they might be shared”, instead of focusing on allocation of losses incurred through environmental regulations,¹⁰ would secure wider participation in MEAs and their implementation. Even developing countries would be more willing to join and implement MEAs, as they would see ways to meet environmental commitments without compromising their development objectives. Industry, encouraged to research profitable alternatives, could also take a more proactive approach in complying with MEAs.

8 El-Kholy O. (2001). Cleaner Production, Encyclopaedia of Global Environmental Change, John Wiley and Sons Ltd.

9 Some treaties do incorporate mechanisms for compensation for participation to developing countries, based on market mechanisms for lowering costs, such as Clean Development Mechanism under the Kyoto Protocol or the Montreal Protocol Multilateral Fund. Applying Cleaner Production strategies goes, however, beyond the scope of those mechanisms. Providing a country has Cleaner Production capacities, it can use Cleaner Production in all national policies and strategies, including the projects not covered by the specific mechanisms under a treaty.

10 Susskind L., Ozawa C. (1994). Environmental Diplomacy: Negotiating More Effective Global Agreements. New York: Oxford University Press, Inc.

Box 10. Cleaner Production: Development and Economic Benefits: Case Study of CP in Pulp and Paper Sector in Canada

In the late 60s, the Canadian pulp and paper sector represented, on an aggregated basis, the largest source of organic water pollution from industrial sources. The industry was at the same time a significant contributor to the GNP, a major employer and major foreign currency earner.

To resolve the problem, the Canadian Government drafted a regulation of almost exclusively end-of-pipe nature, requiring higher levels of environmental control through tertiary levels of treatment. But the industry's message to the government was not to require chemical recovery at old sulphite mills, but to allow industry to consider alternative process technologies that would be more cost effective.

The stakeholder dialogue resulted in the re-drafting of the legislation. It required new investment to apply so-called "best practicable technologies", that were more resource efficient, thereby reducing the generation of wastes and pollution load. Existing industry was also given targets for control in the regulations, but the date of application was left open, to allow for plant by plant negotiated compliance schedules. To enhance compliance, the Canadian government instituted industry modernisation/expansion programmes. As the result, many mills opted for TCMP processes (thermal/chemical/mechanical combinations) which allowed industry to produce pulp more cheaply and utilise a higher proportion of the fibre from their wood supply. This was effectively the adoption of "Cleaner Production" technology – not for environmental reasons, but for business reasons.

Today the industry is in compliance. It has instituted sustainable practices both in its forestry operations and in its production facilities. It is a more competitive industry and better able to respond to the cycles in world demand and pricing of their product. Still a major contributor to GNP and Canada's largest industrial employer, the industry has added a workforce of 22,700 since 1973. A record \$ 9.0 billion (in different forms of taxation) was paid to all levels of government in Canada by the Canadian forest industry. The capacity of the industry has increased by almost 20% since the first pulp and paper regulations were enacted, and the reduction of pollution load as measured by BOD (Biochemical Oxygen Demand) and Suspended Solids has been reduced by almost 90%. An industry that has embraced Cleaner Production options is more efficient, more competitive, and is positioned to continue to participate profitably in global markets. It was driven there by the market place and allowed to make its technology choices by a regulatory regime that permitted those choices to be made.

Source: China-Canada Co-operation Project in Cleaner Production <http://www.chinacp.com/>

3.5 Ground for Synergies.

Cleaner Production can be an effective strategy to integrate the goals of different Conventions. Tackling environmental problems in a holistic way, based on a preventive and a life cycle approach, is a way to synergise efforts of different Conventions in pursuing a common goal of sustainable development. For example, Cleaner Production could be an effective strategy to resolve contradictions between goals of the Kyoto and Montreal Protocols. The Montreal Protocol regime resulted in an increased use of hydrofluorocarbons (HFCs) as substitutes for ozone depleting substances. This creates an apparent conflict with the goals of the Kyoto Protocol, because HFCs are gases with high global warming potential and are included in the Kyoto "basket of gases". The Cleaner Production approach to reconcile the goals of both protocols is to develop systems and mechanisms that use HFC in such a way that the combined greenhouse effect of HFCs and carbon dioxide is lower than that of carbon dioxide emissions from the old technology.¹¹

Similarly, efforts of the Rotterdam, Basel, the Stockholm Conventions and Global Programme of Actions for Protecting the Marine Environment from the Land-Based Sources (GPA) could be synergised via systematic preventative management of hazardous chemicals. Cleaner Production strategies could help in elimination of the organic persistent pollutants (addressed by the Stockholm Convention), reduce the need for their disposal (covered by the Basel Convention) and trade (addressed by the Rotterdam Convention) thus contribute to the GPA's goal of protecting the marine environment from the land-based sources.

¹¹ Synergies, UNEP (1999). Finding Synergies, Issue 2.

3.6 Flexibility

The concept of Cleaner Production includes the emphasis on continuous improvement of environmental performance, through an elaborate procedure of review and innovation built into the Cleaner Production assessment process. Cleaner Production encourages measuring of not only environmental, but also economic performance, and evaluating progress on a continuous basis. It minimises the need for a rigid set of standards or rules that quickly become outdated due to rapid developments in technology and society and helps to add flexibility to the implementation framework of MEAs.

To summarise and highlight the benefits of Cleaner Production for MEAs, their implementation via prevention is compared to that via traditional curative end-of-pipe approaches in the Box 11. Many modern MEAs recognise the advantages of preventative strategies and contain references to Cleaner Production or its components.

Box 11. Comparison of implementing MEAs via Cleaner production versus via end-of-pipe strategies.

END of PIPE	CLEANER PRODUCTION
Economic effectiveness	
Can hinder development due to high capital requirements and operating costs for end-of-pipe solutions without increasing the production output	Brings economic gains due to reduced costs of input materials and energy because of higher energy and material efficiency; increased innovation and competitiveness
High costs of end-of-pipe equipment increases the reliance of developing countries on financial aid	Has potential to let developing countries meet goals of MEAs via innovative solutions to environmental problems
Often involves high administrative costs for legislation enforcement	Reduces the costs of enforcing legislation by offering incentives for self-compliance
Shifts the inevitable burden of clean-up costs forward in time, so that future generations have to bear them	Countries with capability in Cleaner Production avoid, or minimise, the necessity to incur clean-up costs of environmental pollution in the present and in future
Environmental Effectiveness	
Shifts environmental problems from one environmental medium to another; or forward in time	Prevents environmental problems from occurring in the first place Reduces negative environmental impacts along the life cycle of a product, process or service along its life cycle
Requires increased input of energy and materials to operate the additional end-of-pipe installations	Improves resource efficiency Reduces the consumption of energy and materials
Can lead to contradiction between goals of the different MEAs	Has potential to meet goals of several MEAs at the same time, contributing to sustainable development
Has no or low potential for resolving some complex environmental problems (ozone layer depletion, global warming)	Has potential to mitigate environmental problems which cannot be tackled with end-of-pipe approaches
Relies on solving environmental problems via narrowly defined environmental policies	Encourages integration of environmental policies into all sectors of decision-making
Social Effects	
Results in low participation in and compliance with MEAs due to the persistent opinion that environmental protection is burdensome for the environment	Can improve implementation of the MEAs by offering to the Parties and implementation actors positive incentives for participation, compliance and implementation of the environmental agreements
Can result in adverse response to the regulation from the regulated actors	Encourages stakeholder dialogue by emphasising the multiple benefits of environmental protection via Cleaner Production

4.0 Cleaner Production in Multilateral Environmental Agreements: Current Status and baseline activities

In this section, the status and relevance of Cleaner Production in modern MEAs is outlined. The focus is on the core environmental conventions and agreements of global significance whose negotiation and/or activities have been associated with UNEP's work. These core MEAs are basically divided into five clusters: the biodiversity-related MEAs, the atmosphere conventions, the land conventions, the chemicals and hazardous wastes conventions, and the regional seas and related agreements.¹² A comprehensive analysis of existing MEAs, numbering over 500, is virtually impossible. Instead, examples of MEAs are chosen from each cluster to demonstrate the application of Cleaner Production strategies. Special attention is given to the MEAs incorporating precautionary approach as these can directly benefit from Cleaner Production as a strategy to put precautionary approach into practical actions.

Chemical and Hazardous Waste Cluster

The MEAs in this cluster all deal with management of chemicals and are directly relevant to Cleaner Production¹³. The main treaties of the cluster are the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, the Rotterdam Convention on the Prior Informed Consent for Certain Hazardous Chemicals and Pesticides in International Trade, the Stockholm Convention on Persistent Organic Pollutants (POPs) and the Montreal Protocol on Substances that Deplete the Ozone Layer. These Conventions are complemented by a number of other legal documents and regional agreements. (Rotterdam and Stockholm are not yet in force)

The Basel Convention has strong focus on Cleaner Production, both in its objectives and in the implementation mechanisms. The Parties have a general obligation for waste minimisation, as well as more specific obligations to co-operate in developing environmentally sound low waste technologies, to provide training and information exchange on waste minimisation and Cleaner Production. The Ministerial Declaration on Environmentally Sound Management, adopted by the 5th Conference of Parties to the Basel Convention, further strengthened the Convention's objective to prevent and minimise waste generation, and to promote transfer and use of cleaner technologies.

Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movements and Management of Hazardous Wastes within Africa is a part of the hazardous waste cluster (not yet in force). This agreement provides an example of the strongest legal text on Cleaner Production. Parties are required to take "measures to implement the precautionary principle to prevent pollution through the application of clean production methods, rather than the pursuit of a permissible emissions approach based on assimilative capacity assumptions". The Convention clearly distinguishes between Cleaner Production and "end-of-pipe" methods as well as prescribes concrete measures to promote Cleaner Production (Box 12).

The Stockholm Convention and the Rotterdam Convention both contain provisions relevant to Cleaner Production. The Stockholm Convention contains direct references to preventative approaches in its preamble and key control provisions. Cleaner Production is of crucial importance for implementing the POPs treaty, particularly in

¹² UNEP Open-ended Intergovernmental Group of Ministers on International Environmental Governance (2001). International Environmental Governance: Multilateral Environmental Agreements, (UNEP/IGM/2/INF/3), Bonn Germany, 17 July.

¹³ The key provisions of those conventions relevant to Cleaner Production are presented in the Annex 1.

regard to the Convention's goal of continuing minimisation and, where feasible, elimination of the unintentionally produced POPs, since this goal can be most realistically and efficiently achieved through Cleaner Production. All articles of the Convention contain references to one or another component of Cleaner Production, including prevention-oriented policymaking, cleaner technologies, information exchange and training. The overview demonstrates that Cleaner Production is relevant to all Conventions of the cluster and, therefore, could not only contribute to the goals of each treaty, but also enhance synergies among them.¹⁴

Although the Rotterdam Convention does not explicitly mandate preventative strategies, it aims to contribute to environmentally sound use of chemicals. Thus, the treaty's requirements on information exchange cover certain aspects of Cleaner Production, such as safer alternatives to hazardous chemicals; cleaner technology, and developing infrastructure to manage chemicals throughout their life cycle.

Box 12. Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movements and Management of Hazardous Wastes within Africa

Article 3. Waste Generation in Africa

Adoption of Precautionary Measures:

(f) Each Party shall strive to adopt and implement the preventive, precautionary approach to pollution problems which entails, inter-alia, preventing the release into the environment of substances which may cause harm to humans or the environment without waiting for scientific proof regarding such harm.

The Parties shall co-operate with each other in taking the appropriate measures to implement the precautionary principle to pollution prevention through the application of clean production methods, rather than the pursuit of a permissible emissions approach based on assimilative capacity assumptions;

(g) In this respect Parties shall promote clean production methods applicable to entire product life cycles including

raw material selection, extraction and processing;

product conceptualisation, design, manufacture and assemblage;

materials transport during all phases; industrial and household usage;

reintroduction of the product into industrial systems or nature when it no longer serves a useful function.

Clean production shall not include "end-of-pipe" pollution controls such as filters and scrubbers, or chemical, physical or biological treatment. Measures which reduce the volume of waste by incineration or concentration, mask the hazard by dilution, or transfer pollutants from one environmental medium to another, are also excluded

Under the Montreal Protocol, Cleaner Production strategies for safer alternatives are a cornerstone of compliance with control measures to eliminate ozone-depleting substances. The Protocol requires information exchange on "possible alternatives to controlled substances, to products containing such substances, and to products manufactured with them". Parties are also required to take every practical step to (see article 10A) ensure transfer to the Parties in the need for assistance of "the best available, environmentally safe substitutes and related technologies". Implementation of the Protocol involves practical application of Cleaner Production, including UNIDO assistance in technology transfer and training on Cleaner Production.¹⁵ UNIDO, UNDP, World Bank and UNEP are all implementing agencies.

Biodiversity Cluster

Protection of biodiversity is directly relevant to pollution management and efficient use of resources, and, therefore, to Cleaner Production as a strategy to minimise pollution.

¹⁴ See also section Multilateral Environmental Agreements and Cleaner Production.

¹⁵ UN International Development Organisation (2001). Montreal Protocol Branch. Available: <http://www.unido.org>.

The text of the Convention on Biodiversity (CBD) – the key convention of the cluster – does not explicitly refer to Cleaner Production. However, it encourages one of the components of Cleaner Production - "transfer of technologies relevant to conservation and sustainable use of biological diversity and do not cause significant damage to the environment". Cleaner Production is also recognised as a key strategy for implementation of the Convention in some areas, such as inland waters biodiversity. The Parties to CBD are requested to develop "preventative strategies such as Cleaner Production, continual environmental improvement, corporate environmental reporting, product stewardship and environmentally sound technologies to avoid degradation and promote restoration of inland water ecosystems" (CBD, COP-4, Decision IV/4).

Atmosphere Cluster

Several agreements of the cluster encourage Cleaner Production, including the Vienna Convention, the Kyoto Protocol to the United Nations Framework Convention on Climate Change.

The Kyoto Protocol on Climate Change – one of the most far-reaching agreements on environment and sustainable development affecting all sectors of the society – also strongly encourages Cleaner Production. It sets out the goals of reducing emission of greenhouse gases that, without compromising economic or social needs, can be only achieved via Cleaner Production-based "win-win" strategies. There are simply no end-of-pipe technologies feasible for eliminating carbon dioxide emissions. The Protocol's Clean Development Mechanism (CDM) will provide credit for financing emissions-reducing or emissions-avoiding projects in developing countries, and can become an efficient vehicle for transferring clean technologies and Cleaner Production practices.

Marine Environment Cluster

Conventions relevant to marine environment represent the largest cluster of MEAs. It includes, among others, 17 Regional Seas conventions and action plans and the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA). GPA provides conceptual and practical guidance for protection of the marine environment from land-based sources of pollution, and is founded on "the precautionary, preventative and anticipatory approaches". Actions recommended by GPA cover most, if not all, of the components of Cleaner Production: policies aimed at encouraging prevention, use of substitutes for hazardous chemicals, use of BAT and BEP, Cleaner Production processes, etc.

The Regional Seas conventions and action plans are multi-sectoral agreements, most of which incorporate the precautionary principle and a high-priority aim to prevent and eliminate pollution of a specific sea as highest priority. They strongly emphasise the role of Cleaner Production in implementation through the provisions on implementation, including those on international co-operation and technological assistance. The Contracting Parties are required, inter alia, to define pollution prevention criteria, promote environmental education and awareness on the need to prevent pollution, and implement programs of technological and scientific assistance with a view to preventing pollution.

Other international agreements

The developments in EU regulation represent worthy examples of incorporating Cleaner Production into international regulatory framework. The EU Maastricht Treaty stated that the Community environmental policy "shall be based on the precautionary principle and on the principles that preventative action should be taken". The 5th Environmental Action Programme (EAP) "Towards Sustainability" clearly stated that incorporating Cleaner Production into the EU policy in general, and especially in its industrial and

environmental policy, is one of its priorities and major objectives¹⁶. Though not legally binding, EAP enables the Commission to bring in new pieces of legislation, and currently Cleaner Production is pertaining to all areas of EU environmental regulation, including the Integrated Pollution Control Directive, directives on waste management and energy, on environmental management systems and many others.

The overview presented above covers only international agreements. Two recently adopted declarations relevant to Cleaner Production confirm ever-growing attention to Cleaner Production in the international arena.

The Malmo Ministerial Declaration adopted at the UNEP Global Ministerial Environment Forum, May 2000, set Cleaner Production high in the environmental agenda for the 21st century. The Declaration asserted the need to “intensify our efforts in developing preventive action and a concerted response, including national environmental governance and the international rule of law”. It also called for further “establishment of a precautionary approach in investment and technology decisions [...] linked to the development of cleaner and more resource efficient technologies for a life-cycle economy and efforts to facilitate the transfer of environmentally sound technologies”.

The discussion would be incomplete without mentioning the International Declaration on Cleaner Production. It has been developed by UNEP after extensive consultation with diverse interest groups, and to date, 42 governments have signed the Declaration. The Declaration aims to prompt political, public and private business leaders to reinforce the endorsement of a more diverse, intense and broader adoption of Cleaner Production world - wide. The UNEP has also prepared the Implementation Guidelines to facilitate implementation of the six Principles in the Declaration and measuring progress. The Declaration on Cleaner Production enables commitments to Cleaner Production and thus strengthens the mandate of Cleaner Production-related Conventions and regulations.

¹⁶ European Environmental Agency. (2001). Available:
http://service.eea.eu.int/environtwindows/ii_2_1.shtml

5.0 Incorporating Cleaner Production to facilitate implementation of MEAs --The ISSUES

Notwithstanding the progress achieved in global environmental governance, there remain serious challenges to improve the effectiveness of MEAs as the key tools of global environmental protection, including providing strong incentives for compliance and implementation, and creating adequate financial and human resources for environmental protection.

Vision:

Global environmental protection efforts are directed towards preventing environmental problems at source. Multi-stakeholder partnerships effectively implement MEAs via Cleaner Production strategies that produce environmental, economic and social benefits shared among all actors and help advance the agenda of sustainable development by altering unsustainable patterns of production and consumption.

Values:

- Cleaner Production and MEAs share a common goal of sustainable development.
- Cleaner Production is a preventative strategy to deal with current and future environmental problems.
- Interrelated environmental, economic, and social benefits of Cleaner Production offer positive incentives to actors to join MEAs and comply with their spirit.
- Multiple benefits of Cleaner Production can help to foster multi-level partnerships crucial to reaching the goals of MEAs.
- Incorporation of Cleaner Production allows avoidance of duplication of efforts and the most efficient use of resources for implementing MEAs
- Cleaner Production can help to ensure flexibility and synergies among MEAs
- Capacity building activities under MEAs should focus on preventative strategies. This will lead to strengthened partnerships, a more coherent approach to complex environmental problems, and improved capacity building for sustainable development.
- MEAs can support and facilitate widespread application of Cleaner Production

Current Situation:

- The effectiveness, compliance with and implementation of MEAs remains rather low and needs to be improved.
- Cleaner Production experiences and expertise are readily available but widespread awareness about Cleaner Production is lacking.
- There are currently no strong links between implementation of MEAs and Cleaner Production, its tools, methodologies and promoters. Only a few Cleaner Production joint projects are implemented under MEAs.
- Implementation of MEAs tends to facilitate mainly end-of-pipe strategies

Gaps between current situation and future vision/objectives:

- Catalytic activities are needed to link the goals of MEAs and Cleaner Production
- There is a lack of awareness and commitment to Cleaner Production among MEAs implementation bodies
- There is a lack of awareness on needs and goals of MEAs among Cleaner Production practitioners
- Consequently there is a lack of concerted joint efforts between MEAs' implementation agencies and Cleaner Production practitioners to reach MEAs goals
- Lack of clear criteria to measure progress of MEAs in encouraging preventative strategies

- Not sufficient emphasis on preventative strategies in current capacity building activities
- Cleaner Production methodologies, tools, experience and experts are not sufficiently involved in implementation efforts under the Conventions, which often lead to duplication of efforts
- Only limited communication exists among MEAs implementation bodies on all levels and Cleaner Production practitioners
- Lack of financing for current and future Cleaner Production initiatives

Preventative strategies, embodied by Cleaner Production, could help to bridge these gaps and thus meet the emerging challenges. However, currently a large potential of Cleaner Production remains untapped due to a lack of awareness about Cleaner Production among decision-makers on all levels and a lack of co-operation among MEAs implementation bodies and Cleaner Production practitioners at all levels. **ISSUE 1: HOW TO DISSEMINATE AND DEMONSTRATE THE POTENTIAL OF PREVENTIVE STRATEGIES IN IMPLEMENTATION OF MEAs**

In order to change the situation, and ensure that the potential of Cleaner Production is adequately utilised in global environmental protection efforts, it is necessary to apply a strategic approach to promoting integration of Cleaner Production and implementation of MEAs. The strategy should elaborate various actions that different stakeholders could take. It should provide a basis for formulating a concrete action plan on integrating Cleaner Production as a strategy and its networks in implementation efforts of MEAs. The UNEP DTIE Cleaner Production Unit has been successful in promoting Cleaner Production world-wide, and it is logical that it continues to play a role of a catalyst in further promoting preventative strategies. **ISSUE2: HOW TO PROMOTE AND ENSURE PRACTICAL ADOPTION OF CLEANER PRODUCTION STRATEGIES IN THE IMPLEMENTATION OF MEAs.**

A multi-stakeholder dialogue for incorporating Cleaner Production to facilitate implementation of MEAs needs to be initiated. Direct efforts of all involved actors is solicited to ensure that results and benefits of the strategy are shared among all stakeholders, and monitoring, learning and continuous improvement are provided for. Successful integration of Cleaner Production in the implementation of MEAs requires that all involved actors are fully aware of Cleaner Production benefits and willing to co-operate in building capacity to apply Cleaner Production strategies into practice. **ISSUE 3: HOW TO EFFECTIVELY ENGAGE THE STAKEHOLDERS (GOVERNMENT, INDUSTRY, MEA SECRETARIATS AND IMPLEMENTATION AUTHORITIES, CLEANER PRODUCTION PRACTITIONERS, CIVIL SOCIETY ETC.) IN INTEGRATING PREVENTIVE STRATEGIES IN THE IMPLEMENTATION PROCESS OF MEAs.**

As mentioned earlier, most of the MEAs are implemented via national legislation and regulatory measures. Domestic implementation of MEAs is a "long term process of converting international commitments and behavioural change of target groups i.e. those causing the problem in question". Quite often, there is a communication and inter action gap between the implementation authorities and target groups. Cleaner Production practitioners work closely both with the implementation authorities and target groups. They often have established strong bonds with industry and national governments. In accordance with the GEF recommendation to make use of the existing structures and local consultants, networks of Cleaner Production Centres could be involved, where appropriate, to bridge the gap and facilitate stakeholder consultation. This could lead to the formulation of strategic partnerships for implementing MEAs through preventative strategies. **ISSUE 4: WHICH AGENCIES (e.g. NATIONAL**

CLEANER PRODUCTION CENTRES) AT THE LOCAL LEVEL, COULD BE INVOLVED TO FACILITATE THE PROCESS OF IMPLEMENTATION OF MEAs THROUGH PREVENTATIVE STRATEGIES.

An important aspect in the implementation of MEAs relates to capacity building at the national and local level so that the MEA is understood, not only in terms of legal provisions, but also, in spirit by all the stakeholders. Implementation of MEAs has to be viewed from the broader perspective of whether the problem, which necessitated the creation of the particular MEA has been resolved. This requires, inter-alia, a thorough understanding of the context and issues involved by all the stakeholders. Typically, the capacity building process has focussed mostly on the legal aspects targeted at implementation authorities. Using preventative strategies for facilitating implementation of MEAs would ensure that the importance and potential of such strategies be understood by the implementation authorities as well as industries. Simultaneously, the facilitators of preventative strategies also need to understand the MEAs so that they are able to tailor-make preventative strategies to suit the MEAs. The obvious benefit of this dual capacity building process would be enhanced effectiveness of implementation of MEAs extending beyond legal provisions. **ISSUE 5: HOW TO INTEGRATE CLEANER PRODUCTION INTO THE CAPACITY BUILDING PROCESS OF VARIOUS MEAs.**

Using Cleaner Production as a strategy for practical implementation can facilitate attaining the objectives of most, if not all, MEAs. Use of such precautionary and preventative approach, also stressed in Agenda 21, would enable economic growth in an environmentally sound and cost effective manner.

Cleaner Production can be an effective strategy to integrate the goals of different MEAs and thus make them supportive of each other. Incorporating preventive approaches on a life cycle basis is a way to synergise efforts of different Conventions in pursuing the common goal of sustainable development. It also helps to optimise the response to the requirements of the Conventions. From the business point of view, Cleaner Production enables addressing different Conventions in a holistic way thus making the entire implementation system more cost effective.

The concept of Cleaner Production includes the emphasis on continuous improvement of environmental performance, through a procedure of review and innovation built into the Cleaner Production assessment process. Incorporating Cleaner Production into the implementation framework of MEAs could add flexibility to them and help in reducing the adverse impacts of the rigid sets of standards or rules that quickly become outdated due to rapid developments in technology. Cleaner Production can be a sound addition to the set of traditional techniques to render flexibility to the MEAs. The UNEP DTIE, with its experience in promoting Cleaner Production as well as with its links to MEAs implementation bodies could play the catalytic role in the process of increasing effectiveness of MEAs via Cleaner Production.

Annex: Key Provisions in the text of MEAs relevant to Cleaner Production

A. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes

Summary:

The Convention has a strong focus on prevention both in its mandate and in the provisions on the implementation mechanisms. The focus on Cleaner Production is further reiterated by the Ministerial Declaration on Environmentally Sound Management adopted by the Fifth Conference of Parties (COP-5). Furthermore, the recent documents produced by the Convention Subsidiary Bodies clearly indicate that Cleaner Production and co-operation with parties having expertise in Cleaner Production are recognised to be of the growing importance for the implementation of the Convention.

Preamble, Objective and General Obligations

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal is one of the conventions with the biggest emphasis on preventative strategies. Its preamble explicitly recognises that *“the most effective way of protecting human health and environment is the reduction of their [hazardous wastes] generation to a minimum in terms of quantity and /or hazard potential”*.

The Convention places general obligations for the Parties (Article 4, para 2. “General Obligations”) *“to ensure that the generation of hazardous wastes and other wastes within it is reduced to a minimum, taking into account social, technological and economic aspects”*.

According to clarification by the Basel Convention Secretariat, overall, the objective of the Convention is “the reduction of transboundary movements of hazardous and other wastes subject to the Basel Convention, the prevention and minimisation of their generation, the environmentally sound management of such wastes and the active promotion of the transfer and use of cleaner technologies”.¹⁷

Therefore, the mandate of the Convention strongly requires preventative approach from the Parties and provides a solid basis for Cleaner Production.

A fundamental objective of the prevention and minimisation of generation of wastes is reaffirmed by the Basel Declaration on Environmentally Sound Management of Hazardous Waste

Implementation mechanisms

The Convention is governed by the Conference of Parties and a number of subsidiary bodies. Currently subsidiary bodies include, as established by COP-5, the Working Group for Implementation of the Convention (IWG), Technical and Legal Working Groups (TWG and LWG), and the Expanded Bureau. The Secretariat of the Convention collects and disseminates information needed for the tasks and co-ordinates contacts with all Parties and partners involved. It also involved directly in some of the implementing activities at the national level.

¹⁷ As clarified by the Basel Declaration on Environmentally Sound Management.

The Parties, consistent with national laws and regulations shall transmit, through the Secretariat, to the Conference of the Parties information on the implementation of the Convention before the end of each calendar year.

The Convention operates through the designated Focal Points and Competent Authorities in each Party. Regional Training Centres are also establishments important for implementing the Convention.

The preventative mandate of the Convention is reflected in the provisions on implementation mechanisms. Strong emphasis on the prevention is also reflected in the latest documents of the COPs and reports of the subsidiary bodies.

More specifically, the following provisions on implementation mechanisms are directly pertinent to Cleaner Production provisions:

International Co-operation

The Convention requires (Article 10 “International Co-operation”: Parties to:

- “co-operate /.../ in the development and implementation of new environmentally sound low-waste technologies and the improvement of existing technologies with a view to eliminating, as far as practicable, the generation of hazardous wastes and achieving more effective and efficient methods of ensuring their management in an environmentally sound manner, including the study of economic, social and environmental effects of the adoption of such new or improved technologies”;
- “co-operate in developing appropriate technical standards and/or codes of practice”;
- “assist developing countries in the implementation” of provisions on monitoring, reporting, development and transfer of new technologies, and meeting general obligations (incl. an obligation for waste minimisation).

The article encourages [para 4] co-operation between Parties and international organisations “to promote, inter alia, public awareness, and the adoption of new low-waste technologies, taking into account the needs of developing countries”.

Transmission of Information

Article 13 “Transmission of Information”, para (h). The Parties are required to transmit, inter alia, through the Secretariat to the COP, before the end of each calendar year, a report on previous calendar year, containing, inter alia, the “information on measures undertaken for development of technologies for the reduction and/or elimination of production of hazardous wastes and other wastes”.

Capacity Building and Financial Aspects

Under Article 14 “Financial Aspects, Parties agree that “regional and sub-regional centres for training and technology transfers regarding the management of /.../ wastes and the minimisation of their generation should be established”.

The article also provides for establishing a revolving fund. The Fund of the Implementation of the Basel Convention and the Trust Fund to Assist Developing and Other Countries in Need of Technical Assistance (BD Trust Fund) have been created.

Functions of the Secretariat

Article 16 “Secretariat”. The Secretariat is obliged to prepare and transmit reports based upon information received in accordance with provisions of the Convention, including information on minimisation of waste generation. Inter alia, it is obliged to provide

information on sources of technical assistance and training, available technical and scientific know-how, sources of advice and expertise, and availability of resources with a view to assisting to the Parties, “in the area of environmentally sound technologies relating to hazardous wastes; such as low- and non-waste technology”.

Annex I – Wastes to be controlled

Annex II – Wastes requiring special consideration

Annex III – List of Hazardous Characteristics

Annex IV – Disposal Operations

Annex V- Information to be provided on notification

Annex V- Information to be provided on the movement document

Annex VI – Arbitration

Annex VII – Wastes that are characterised as the hazardous but their designation on this list does not preclude the use of the Annex III to demonstrate that a waste is NOT hazardous

Annex VIII –Waste that are not characterised as the hazardous and are not to be controlled, unless they contain Annex I material to the amount causing them to demonstrate the characteristics of the Annex III

The Secretariat is involved in the implementation of projects on the regional and national levels.

B. The Basel Ministerial Declaration on Environmentally Sound Management

Mandate

The Declaration further strengthened the mandate of the Convention in regard to the minimisation of generation of wastes, reaffirming (para 2) fundamental aims of Basel Convention, “namely, the prevention and minimisation of their [wastes] generation, [...] and the active promotion of the transfer and use of cleaner technologies”.

Prevention and minimisation of wastes, as well as active promotion and use of cleaner technologies and production are the top activities to be strengthened and enhanced by the Declaration (para 6).

The Declaration decided that for the next decade of the Basel Convention, the following activities, directly linked to Cleaner Production, should be undertaken:

- “Prevention, minimisation of waste”, including “elaboration of a concept and a programme for the environmentally sound management of hazardous and other wastes, with an emphasis on waste prevention and minimisation”.
- “Active promotion and use of cleaner technologies with the aim of the prevention and minimisation of hazardous and other wastes subject to the Basel Convention”. Of special importance to Cleaner Production is also a call for the “co-operation of the regional and subregional centres for training and technology transfer with Cleaner Production centres and similar institution having expertise in areas related to the minimisation of [...] hazards and other wastes [...] for the purpose of sharing information and knowledge and streamlining activities”.
- “Improvement and promotion of institutional and technical capacity-building, and development, and of the transfer of environmentally sound technologies, especially for developing countries and countries with economies in transition”, including “the advancement and improvement of strategies for the practical implementation of the minimisation and environmentally sound management” of wastes.
- “Further development of regional and subregional centres for training and technology transfer”, including “the advancement and improvement of strategies for the practical implementation of the minimisation and environmentally sound management” of wastes and involvement in “activities related to training, public awareness and information exchange on waste minimisation”.
- “Enhancement of information exchange, education and awareness-raising in all sectors of society”. Important to note that it includes also development of a “world-wide information system to provide information on available expertise and solutions for waste-related problems”, and, in spirit of the Declaration, it means that information on waste minimisation should be a part of this information system.
- “Co-operation with the relevant programmes on Cleaner Production, such as with the joint programme on Cleaner Production of the UNEP and the UNDP”.

Noteworthy feature is also that the Declaration request upon “the Technical Working Group to work on the selection of waste streams in countries or regions, for the purpose of developing pilot projects on the state of the art in the field of Cleaner Production and the environmentally sound management of hazardous and other wastes, including the development of contingency emergency plans”

It is important that the Declaration decided that “to implement these activities access to financial resources and mechanisms is essential” and requires to undertake activities on development of projects with UNEP for funding by GEF and other international financial mechanisms, and “developing strategies that will harness market forces to promote waste minimisation and environmentally sound management”.

The following activities should be undertaken for implementing the Declaration:

- under the guidance of the Expanded Bureau, the subsidiary bodies of the COP must elaborate on and prioritise the activities for the years 2000-2002 and to start work as soon as possible;
- the subsidiary bodies should prepare a strategic plan for the period up to the year 2010 to address the objectives of the Declaration and to develop a work programme by areas for work based on this decision for years 2003-2004, for consideration and adoption by COP-6;
- the subsidiary bodies should provide periodic information to the COP on progress of implementation of the agenda for the next decade on environmentally sound management;
- the Secretariat should collect and disseminate information needed for tasks and co-ordinate contracts with partners involved; and
- Parties should provide comments to the Secretariat.

C. The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade

Summary:

The Convention does not have an explicitly stated mandate for preventative strategies. The Convention does not contain direct references to Cleaner Production. Nevertheless, the Convention is relevant to Cleaner Production, since the provisions on key mechanisms of implementation of the treaty (incl. on information exchange, technical assistance) cover some aspects of Cleaner Production, such as providing information on safer alternatives to the hazardous chemicals, technical assistance on developing infrastructure and capacity to manage chemicals throughout their life cycle, cleaner technology. Important to note though, that aspects pertaining to Cleaner Production in the Convention have lower priority in comparison with provisions on providing other (legal, relevant to trade, safety and risks) information.

Overall, the Convention, by establishing mechanisms for the information exchange, could possibly contribute to dissemination of information on Cleaner Production, providing the Parties and implementation bodies are willing to do so.

Mandate

Mandate of the Convention does not mention explicitly preventative strategies. However, the Convention's preamble builds upon the UNEP Code of Ethics. The Code has an objective "to set forth principles and guidance for "management of chemicals in international trade taking into account their entire life cycle, with the purpose of reducing risks to human health and the environment", i.e. it contains one of the key elements of Cleaner Production - life cycle approach to reducing risks to human health and environment.

The objective of the Convention also do not mention directly preventative strategies or their components, but it might be implied that it is relevant to Cleaner Production, as the Convention aims to contribute to the "environmentally sound use" of chemicals, which requires application of the preventative approaches.

Objective

Article 1 "Objective". The objective of this Convention is "to promote shared responsibility and co-operative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm and to contribute to their environmentally sound use, by facilitating information exchange about their characteristics, by providing for a national decision making process on their import and export and by disseminating these decisions to Parties.

Implementation mechanisms

In the interim period the Convention is governed by the Intergovernmental Negotiation Committee. FAO and UNEP serve as the Secretariat for the interim period. Information exchange will be co-ordinated by the Secretariat and operated through a network of designated national authorities (DNA) in each Party. Provisions on the implementation mechanisms are described below.

Information Exchange

The key mechanism for the implementation is formal information exchange covered by several provisions. These provisions require or encourage information exchange on some elements of preventative strategies. Detailed information requirements are

specified in the relevant Annexes. However, information requirements on preventative aspects do not have high priority in the articles and annexes. More specifically, the most relevant to Cleaner Production provisions are:

Article 5 “Procedures for Banned or Severely Restricted Chemicals”. The requirement for a Party to notify other parties of each ban or severe restrictions on a chemical it implements. The notification may cover “information on alternatives and their relative risks, where available, such as: integrated pest management strategies; industrial practices and processes including cleaner technology”.

Article 6 “Procedures for Severely Restricted Pesticide Formulations”. The possibility for a developing country Party or a Party with an economy in transition to inform other Parties that it is experiencing problems caused by a severely hazardous pesticide formulation under conditions of use in its territory and propose listing of the formulation under the Convention. This proposal should contain, among alia, information “on alternative pest-control practices” and “other information which the Chemical Review Committee may identify as relevant”.¹⁸

Article 7 “Listing of Chemicals in Annex III”. This article requires the Chemical Review Committee, a body a body that takes decisions on whether a chemical should be subject to the PIC, to prepare and distribute on each chemical which is subject to the PIC procedure a decision guidance document. That document should or may contain¹⁹ “information on alternatives and their relative risks, where available, such as: integrated pest management strategies; industrial practices and processes including cleaner technology”.²⁰

Article 12 “Export Notification”. Requirement to provide an export notification, which shall contain²¹ information on precautionary measures to reduce exposure to, and emission of, a hazardous chemical.

Article 14 “Information Exchange”. Requirement to “facilitate exchange of scientific, technical, economic and legal information concerning the chemicals within the scope of the Convention”. That might imply that information on the available alternatives and Cleaner Production practices should be covered by the exchange.

Other articles

Article 15 “Implementation of the Convention” requires each Party to take measures for the implementation of the Convention. These measures may include “ establishment of national registers and databases, including safety information for chemicals; encouragement of initiatives by industry to promote chemical safety, promotion of voluntary agreements, taking into consideration the provisions of Article 16’. Parties shall also “ensure to the extent practicable, public access to the information on chemical handling and accident management, and on alternatives that are safer for human health or the environment”.

The article also encourages co-operation with other international organisations.

Article 16 “Technical Assistance”. This article, although it does not explicitly mention preventative strategies, is pertinent to Cleaner Production, as the Parties are required to “co-operate in promoting technical assistance for the development of the

¹⁸ Annex IV. Information and Criteria for Listing Severely Hazardous Pesticide Formulations in Annex III.

¹⁹ As specified, at a minimum, by the Annex I, or, as the case may be, by Annex IV.

²⁰ As specified by the **Annex 1, para D. (ii)**

²¹ As specified in the Annex V.

infrastructure and the capacity necessary to manage chemicals to enable implementation of this Convention. Parties with more advanced programmes for regulating chemicals should provide technical assistance, including training, to other Parties in developing their infrastructure and capacity to manage chemicals throughout their life cycle”.

Article 19 “Secretariat”. The Secretariat is obliged to facilitate assistance to the developing Parties and Parties with economies in transition, and to ensure the necessary co-ordination with the secretariats of other relevant international bodies. The Secretariat is obliged to collect and transmit information to the Parties, the Chemical Review Committee, and to the Conference of Parties.

D. The Stockholm Convention on Persistent Organic Pollutants

Summary

The Convention mandates preventative approaches, both in the objective and in the provisions on the implementation, including those on technological assistance and information exchange. Preventative approaches, such as use of safer alternatives, life cycle thinking are relevant both in regard to the intentionally and unintentionally produced POPs, however, in latter case Cleaner Production is of the utmost importance, while in former case higher priority under the Convention is given to the final regulatory actions. The Convention contains also general guidance on preventing and reducing releases of unintentionally produced POPs and further development of more specific guidelines is envisaged.

Preamble and Objective

The Convention's mandate has a strong focus on the preventative strategies, set out by the direct references to Cleaner Production components in the preamble and objective. The preamble recognises "the need to take measures to prevent adverse effects caused by the persistent organic pollutants at all stages of their life cycle" and "the importance of developing and using environmentally sound alternative processes and chemicals".

The objective of the Convention is "mindful of the precautionary approach as set forth in Principle 15 of the Rio Declaration on Environment and Development [...] to protect human health and the environment from persistent organic pollutants". Because precautionary approach is implemented into practice through preventative strategies, therefore Cleaner Production is embodied into the Convention's mandate.

The main provisions of the Convention may be briefly summarised under four headings:

1. Control provisions
2. Provisions on implementation mechanism
3. Procedure for adding new POPs
4. Financial and technical assistance

Control provisions

Control provisions include separate articles for the intentionally and unintentionally produced substances, both pertaining to Cleaner Production. However, the article on unintentionally produced substances setting a goal of continuous minimisation of these POPs is the most relevant, as it contains many direct references to Cleaner Production.

Article 3. Measures to reduce or eliminate releases from intentional production and use. Control provisions for the most of intentionally produced substances, with several exemptions, set forward a goal of the elimination of production and use. The article is relevant to Cleaner Production, as it requires (Article 3. para 3.) Parties "to take measures to regulate with the aim of preventing the production and use of new pesticides or new industrial chemicals, which [...] exhibit the characteristics of persistent organic pollutants", or, in other words, to adopt preventative regulatory approach, which is one of the Cleaner Production components.

Article 4. Measures to reduce or eliminate releases from unintentional production. The article sets a goal to reduce total releases from anthropogenic sources to achieve "continuing minimisation and, where feasible, ultimate elimination". All paragraphs of the article are relevant to Cleaner Production and its different components, including those at policy, technological, methodological levels.

Para a. (i-vi). Parties are to develop action plans within two years of entry into force of Convention and also to implement the plan, which should, inter alia, contain actions to:

- evaluate current and projected releases (source inventories, release estimates)
- evaluate efficacy of laws and policies to manage such releases
- develop strategies, and promote education and training on them
- review success of strategies every five years and report to the COP
- develop schedule for implementation of action plan

Particularly relevant to the preventative strategies are the following requirements:

- promote measures to achieve realistic and meaningful level of release reduction or source elimination (Para b)
- promote the development and, where appropriate, require the use of substitute or modified materials, products and processes to prevent the formation and release of by-product POPs (Para c)
- promote, and as provided for in an action plan, require the use of Best Available Technology (BAT) for new sources within specified source categories in (Part II of) Annex C, and phase in BAT requirements for new sources in Part II of Annex C within four years of the entry into force of the Convention for a Party and for identified new source categories, Parties shall promote the use of Best Environmental Practice (BEP) (Para d)
- promote the use of BAT and BEP for existing sources within identified source categories and for new sources which are not otherwise addressed (Para e)
- the COP will adopt the guidance on BEP (Para e)

The Parties have to use release limit values or performance standards to fulfil commitments for BAT.

The Annex C, Part V (A,B,C) pertaining to the article 4, provides a general guidance on preventing or reducing releases of the chemicals unintentionally produced. It covers most components of Cleaner Production, including low waste technologies, use of alternatives, good housekeeping, process changes.

Implementation mechanisms

The Convention is managed by the INC in the interim period. Guidance on BEP will be adopted by COP. The Secretariat will serve as a clearinghouse for the Convention. The Convention requires each Party to designate national focal points for information exchange. It also encourages establishing regional and Subregional Centers for the capacity building and transfer of technology. Capacity Assistance Network, matching needs for financing and funds, is established. (Managed by GEF-UNEP). Eight ratification workshops will be urgently conducted.

Article 7 “Implementation Plans” requires develop an action plan within two years, involve all relevant stakeholders in doing so, and endeavour to implement, review and update the plan on a periodic basis.

Article 9 “Information Exchange” obliges Parties to facilitate and undertake information exchange relevant to the reduction or elimination of POPs and alternatives to POPs. The Secretariat will serve as a clearing-house mechanism for information. Each Party is required to designate a focal national point for the information exchange.

Article 10 “Public Information, Awareness and Education” obliges Parties to promote public awareness all aspects of POP, develop training programmes, and encourage industry to promote and facilitate the provision of information. Parties are also encouraged to establish national and regional information centres.

Article 11 “Research and Development” requires Parties to encourage research and development on all aspects of POPs, including aspects relating to their environmental releases, presence, transformation, effects, socio-economic impacts, and release reduction and/or elimination.

Parties are also encouraged to define, conduct, assess and finance research, data collection and monitoring, taking into account the need to minimise duplication of efforts.

Parties are also required to support and further develop, as appropriate, international programs, networks and organisations aiming at defining, conducting, assessing and financing research, data collection and monitoring, with a view to minimising duplication of efforts.

Article 20 “Secretariat” requires the Secretariat, inter alia, to facilitate assistance to the Parties, to ensure the necessary co-ordination. Unlike the Basel Secretariat, not involved into the regional/national projects directly. But it manages all financial aspects, incl. training workshops. Will work with CAN.

Financial and Technical Assistance

Article 12 “Technical Assistance”. Technical assistance to be provided by developed Parties, and other Parties in accordance with their capabilities, for capacity building. Arrangements, including regional and subregional centres for capacity building and transfer of technology, the purpose of providing technical assistance and promoting transfer of technology to developing countries to be made.

Article 13 “Financial Resources and Mechanisms”. The developed Parties will provide new and additional resources to enable developing Parties to meet the agreed full incremental costs of implementing measures that fulfil their obligations. The GEF was designated as an interim financial mechanism.

E. The Global Programme of Action (GPA) for the Protection of the Marine Environment from Land-based Activities

The Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) and the Washington Declaration was adopted in 1995 are not legally binding, yet GPA prompts development of national and regional programmes of action and strengthening of regional and sub-region arrangements.

Mandate

GPA “aims at preventing the degradation of the marine environment from land-based activities” and “designed to assist States in taking actions [...], which will lead to the prevention, reduction, control and/or elimination of the degradation of the marine environment, as well as to its recovery from the impacts of land-based activities”.

GPA is based on an agreement “to apply preventive, precautionary, and anticipatory approaches so as to avoid degradation of the marine environment, as well as to reduce the risk of long-term or irreversible adverse effects upon it”.

States are asked to: identify and assess pollution and physical alteration problems; establish priorities for action; set management objectives for priority actions; identify, evaluate and select management strategies; develop criteria for evaluating management strategies; and ensure adequate programme support elements, such as new legislation and innovative financial arrangements.

The GPA suggests specific objectives and actions to address the priority areas - eight pollutant-source categories (sewage, POPs, radioactive substances, heavy metals, oils, nutrients, sediment mobilisation, and litter) and physical alteration.

Implementation mechanisms

The implementation of GPA reviewed by the UNEP Governing Council and Intergovernmental Review meetings. GPA is administered by UNEP, which involved into development of plans and programmes at national and regional levels, as well as in implementation of several projects, including GEF (co-) funded projects. GPA is delivered through the Regional Seas Programme.

International Co-operation

Provisions on international co-operation (Chapter IV) in four areas (capacity-building, mobilising financial resources; international institutional framework, POPs and waste water treatment and management) are all relevant to Cleaner Production, because they place a high priority on co-operation for promoting and facilitating economically rational, environmentally sound and cleaner practices, techniques and technologies to prevent adverse impacts on marine environment.

Recommended Approaches

Recommended approaches by source category (Chapter V) cover the most, if not all, components of Cleaner Production: integrated pollution control, policies aimed at encouraging prevention, use of substitutes for hazardous chemicals, use of BAT and BEP, Cleaner Production processes, etc.

F. Regional Seas Programme

UNEP Regional Seas Programme fosters co-operation on behalf of marine and coastal environment. It stimulates creation of “Action Plans” - prescriptions for sound environmental management - for each region. UNEP helps to draft the text of the Action Plan and organises intergovernmental meeting for its adoption. Out of 17 Regional Programs 14 are initiated by UNEP. Of these, 13 adopted regional action plans. An umbrella convention, elaborated by the specific protocols, most often provides the legal framework for co-operative regional and national actions. Protocols for the Protection of the regional seas against pollution from land-based sources are commonly legal tools for implementing Global Program of Actions²². Provisions on land-based sources of pollution exist also under the Convention for the Protection of the Marine Environment of the North-East Atlantic and Convention for the Protection of the Natural Resources and Environment of the Baltic Sea Area (HELCOM), which are not included in the UNEP Regional Sea Programme.

Mandate

Most of the regional sea conventions and subsequent protocols for land based sources of pollution place a strong obligation on Parties to apply precautionary principle, by virtue of which preventative measures to be taken. Parties are obliged to “prevent, reduce and control pollution” usually by the articles on general obligations. Some of the Conventions (e.g. HELCOM, OSPAR, the Barcelona Convention) place special emphasis on the general obligation to apply BAT, BEP and clean technology. The Regional Sea conventions therefore are extremely relevant to and supportive to CP.

Implementation mechanisms

Most of the Conventions are governed by the Intergovernmental Meetings, have a Secretariat, which is often involved into implementation and co-ordination of activities at the national level, and a number of subsidiary bodies (e.g. scientific, technical and advisory committees). Some of the Conventions operate through regional activity centres or units (e.g. the Cartagena and the Barcelona Conventions). Funding is provided through the GEF, UNEP and/or voluntary contributions to the trust funds or other donor agreements.

The conventions include the provisions on implementation, which, depending on a convention, cover a range of issues, including international co-operation, research and development, etc. The provisions on implementation, in accordance with the overall prevention-oriented spirit of the conventions, reflect need for Cleaner Production.

For example, Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean requires Parties to co-operate (**Article 13 “Scientific and Technological Co-operation”**) in:

- promoting *“the research on, access to and transfer of environmentally sound technologies, including clean production technologies”*,

²² These protocols exist under: the Barcelona Convention for the Protection of the Mediterranean Sea; Kuwait Regional Convention for Co-operation and Protection of Marine Environment from Pollution; Convention for the Protection of the Marine Environmental and Coastal Area of the South-East Pacific; Convention of the Protection and Development of the Marine Environment of the Wider Caribbean Region; and Convention on the Protection of the Black Sea against Pollution.

- *“the formulation, establishment and implementation of clean production processes” and elaboration of rules, standards, and [...] practices and procedures for prevention, reduction and control of pollution”;*
- *“the development, acquisition and introduction of clean and low-waste technology”.*

The subsequent to the Barcelona Convention Protocol for the Protection of the Mediterranean Sea Against Pollution from Land-Based Sources, requires Parties to implement *“programmes of assistance to developing countries, particularly in the field of science, education and technology, with a view to preventing pollution from land-based sources”* (Article 10), and to develop “common guidelines, standards and criteria dealing with *“the control and progressive replacement of products, installations and industrial and other processes causing significant pollution of the marine environment”*”.

Overview of some of the regional sea conventions and subsequent protocols (Convention for the Protection of Marine Environment of the North-East Atlantic, Convention on the Protection of the Marine Environment of the Baltic Sea Area (HELCOM); Bucharest Convention on the Protection of the Black Sea against Pollution and Protocol on the Protection of the Black Sea Marine Environment against Pollution from Land Based Sources, and Protocol Concerning Pollution from Land-Based Sources for the Protection and Development of Marine Environment of the Wider Caribbean Region) shows that most of them are similarly emphasise Cleaner Production both in the articles on general obligations and in the provisions on the implementation mechanisms.

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