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APPLYING CLEANER PRODUCTION TO MEAs

Global Status Report

UNITED NATIONS ENVIRONMENT PROGRAMME



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Applying Cleaner Production to Multilateral Environmental Agreements

Global Status Report

United Nations Environment Programme
Division of Technology, Industry and Economics

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CONTENT

Chapter 1 - General introduction	1
Chapter 2 – MEA and Cleaner Production	4
Chapter 3 – UN Framework Climate Change Convention	7
3.1 Main objectives and goals	7
3.2 Preventive approach	8
3.3 Baseline activities and current approach	9
3.4 Present implementation status	13
3.5 Problems / barriers	19
3.6 Can CP (further) contribute to the implementation process?	20
3.7 Conclusions	24
Chapter 4 – Basel Convention	26
4.1 Main objectives and goals	26
4.2 Preventive approach	27
4.3 Baseline activities and current approach	28
4.4 Present implementation status	32
4.5 Problems / barriers	34
4.6 Can CP (further) contribute to the implementation process?	34
4.7 Conclusions	37
Chapter 5 – Stockholm Convention on POPs	39
5.1 Main objectives and goals	39
5.2 Preventive approach	40
5.3 Baseline activities and current approach	41
5.4 Present implementation status	44
5.5 Problems / barriers	46
5.6 Can CP (further) contribute to the implementation process?	48
5.7 Conclusions	54
Chapter 6 - Cleaner Production	56
Chapter 7 – Synergy between then MEAs and CP	61
Chapter 8 – Conclusions and recommendations	63
References	67
Annexe 1 – Ukraine country status report	69
Annexe 2 – India country status report	70

Chapter 1 - General introduction

Introduction

Despite technological progress, improved human resources and development of progressive policies, global production and consumption patterns generally remain unsustainable. Since the Stockholm Conference on the Human Environment held in 1972, the natural environment has borne the stress imposed by increasing human numbers and growth in economic output.

The need for sustainable development has been reflected in the adoption of Multinational Environmental Agreements (MEAs). Over 300 agreements have been negotiated since 1972, and they have provided the platform for international co-operation to address common environmental challenges. Despite their growing number, however, their overall effectiveness in addressing crosscutting and transboundary environmental problems still remains low.

This project "Applying Cleaner Production to Multilateral Environmental Agreements" want to contribute to leverage the implementation of MEAs through applying the Cleaner Production concept; focusing on three MEAs that are especially important to industry - the Kyoto Protocol to the UN Framework on Climate Change (UNFCCC), Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, and the Stockholm Convention on Persistent Organic Pollutants (POPs).

Climate Change

Increasing floods, typhoons, and droughts due to climate change are ongoing concerns not just for Asian nations whose human settlements and economies are affected by short-term climatic variability, but also for East European countries. Flooding conditions not seen for centuries hit Eastern Europe recently impacting, among other things, the region's water availability and agricultural productivity. In addition, in Asia, there are large populations living in low-lying coastal areas or adjacent to river deltas and are especially vulnerable to sea level rise with increase in average global temperatures.

The UNFCCC sets the overall framework for intergovernmental efforts to address climate change. Its ultimate objective is to achieve stabilisation of atmospheric concentrations of greenhouse gases that would otherwise interfere with the climate system. The Kyoto Protocol supplements and strengthens the Convention, and its rules and procedures are set out in the Marrakech Accords.

All Parties to the Convention are subject to an important set of general commitments, which place a fundamental obligation on both industrialised, and developing countries to respond to climate change. As part of these general commitments, Parties must also promote the development, application and transfer of climate-friendly technologies and practices.

Hazardous Waste

In the late 1980s, a tightening of environmental regulations in industrialised countries led to a dramatic rise in the cost of hazardous waste disposal. Searching for cheaper ways to get rid of the wastes, "toxic traders" began shipping hazardous waste to developing countries. When this activity was revealed, international concern led to the drafting and adoption of the Basel Convention.

The Basel Convention of 1989 requires exporters of hazardous waste to obtain prior consent from importing nations. Trading toxic waste without permission is a criminal act, and illegally dumped waste generally must be disposed of or taken back by the exporter. To date 158 nations have signed the Convention. Recognising that permission can be purchased from cash-strapped officials, an amendment banning toxic waste exports from rich nations to developing ones was adopted in 1995. So far 62 nations have ratified the amendment, insufficient for entering into force (required is 75% of the countries that accepted the amendment (82 countries)).

The Basel Convention has gone a long way towards bringing toxic waste trade under control, but more needs to be done. The ban on exports from rich to poor still allows toxic waste trade between developing nations. As a first step, the target countries in Asia and Eastern Europe - favourite dumping grounds - need to build capacity to manage hazardous waste coming from their own facilities in an environmentally sound way, which is the central goal of the Basel Convention. Environmentally sound management means addressing the issue through an integrated preventive approach, or adopting Cleaner Production, to reduce in the first place, the generation of hazardous wastes, and then manage its storage, transport, treatment and final disposal.

Persistent Organic Pollutants

The Stockholm Convention on POPs is a global treaty to protect human health and the environment from persistent organic pollutants (POPs). POPs are toxic chemicals that remain intact in the environment for long periods, become widely distributed geographically and accumulate in the fatty tissue of living organisms. Through a variety of distribution mechanisms involving wind and water, POPs circulate globally and can cause damage far from their point of release.

Studies of persistent organic pollutants (POPs), including huge stockpiles of pesticides, reveal evidence of continuous and widespread production and use of some of the most hazardous POPs, thus contributing significantly to the global POPs pollution problem. In implementing the Convention, governments can take measures to eliminate or reduce the release of POPs into the environment.

Addressing the Needs

Although the target countries have actively been engaged in the negotiation process of the three MEAs, progress in implementing them has generally been slow, due in part to the lack of institutional, administrative and financial capacity. Despite existing national plans and programmes, institutional arrangements for implementing MEAs are not well developed, and approaches to MEAs have been predominantly government-driven from

a regulatory "command-and-control" perspective. Preventive measures such as Cleaner Production and other indirect measures are still not fully utilised. Stakeholders such as the industry and financial sector, have yet to be effectively involved despite their critical role in effective MEA implementation at the national level.

This Global Status Report will address the 3 specific MEAs (global climate change, hazardous wastes and POPs). After a general introduction on Multilateral Environmental Agreements, from each specific MEA the main objectives and goals will be described with main emphasis on the preventive elements in it. Followed by a brief introduction and current approach and the present implementation status. Finally insight will be given in the potential application of a preventive environmental strategy in each MEA implementation, with best practices in national policies, legislation and industrial practices. After giving a short status on Cleaner Production the report will analyse the generic links between CP and MEA and generate conclusions and recommendations how to further enhanced the effectiveness of MEA-implementation by integrating preventive environmental strategies.

Chapter 2 – MEA 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, counterpoised 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

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. 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 transsectoral. 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 (CBD) and the Framework Convention on Climate Change (UNFCCC)) 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).

Main institutional elements of Multilateral Environmental Agreements (MEAs)

- *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 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, to review and advise their Secretariats on implementation. Subsidiary bodies, which are generally advisory in nature, report to COPs 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*: 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 COP's.
 - 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 MEAs 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.

It is recognised that modern MEAs also face several common challenges. Those challenges include:

- Need to 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 preventive strategies.

Chapter 3 – UN Framework Climate Change Convention

3.1 Main objectives and goals

The ultimate objective of the Convention is "... to achieve stabilization of atmospheric concentrations of greenhouse gases at levels that would prevent dangerous anthropogenic (human-induced) interference with the climate system . . ."

Defining what is meant by 'dangerous' involves social and economic considerations as well as scientific judgement. The Convention does, however, state that the level of concentrations should be reached in a time frame that allows ecosystems to adapt naturally, food security to be preserved and economic development to proceed in a sustainable manner. The Convention's principles hinge on:

- Equity and common but differentiated responsibilities, which reflect the reality that, although climate change is a global issue and must be tackled as such, industrialized countries have historically contributed most to the problem and have more resources with which to remedy it. Developing countries, for their part, are more vulnerable to adverse effects and their capacity to respond is likely to be lower.
- A precautionary approach, or recognition that though many uncertainties surround climate change, waiting for certainty before taking action, or precautionary measures, runs the risk of being too late to avert the worst impacts. The Convention notes "where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures."
- Recognition that development and climate change are interlinked and those patterns of energy consumption, land use and demographic growth are key drivers of both. The Convention sees sustainable economic growth and development as essential ingredients of successful policies to tackle climate change. It also calls for policies and measures dealing with climate change to be cost effective, delivering global benefits at the lowest possible cost.

The Convention sets an overall framework for intergovernmental efforts to tackle climate change. It establishes the objective and principles and spells out commitments for different groups of countries according to their circumstances and needs. It also provides a set of institutions to enable governments to monitor efforts to implement the Convention and to share insights on how best to pursue the Convention's aims.

The Convention divides countries into three main groups according to differing commitments:

- Annex I Parties (currently 41 countries) include the industrialised countries that were members of the OECD (Organisation for Economic Co-operation and Development) in 1992, plus countries with economies in transition (the EIT Parties), including the Russian Federation, the Baltic States, and several Central and Eastern European States. A requirement that affects only Annex I Parties is that they must adopt climate change policies and measures with the aim of reducing their greenhouse gas emissions to 1990 levels by the year 2000. This provision obliges them to set an example of firm resolve to deal with climate change.
 - Annex II Parties (27 highly developed countries) consist of the OECD members of Annex I, but not the EIT Parties. They are required to provide

financial resources to enable developing countries to undertake emissions reduction activities under the Convention and to help them adapt to adverse effects of climate change. In addition, they have to "take all practicable steps" to promote the development and transfer of environmentally friendly technologies to EIT Parties and developing countries. Funding provided by Annex II Parties is channelled mostly through the Convention's financial mechanism.

- Countries with Economies in Transition (EIT's). There are 14 of them. These are mostly countries of Eastern and Central Europe and the former Soviet Union, eight of whom are now members of the European Union. They are listed in Annex 1, but they do not have the additional obligations of the Annex II Parties.
- Non-Annex I Parties – as they are termed for ease of reference – are mostly developing countries. Certain groups of developing countries are recognized by the Convention as being specially vulnerable to the adverse impacts of climate change, including countries with low-lying coastal areas and those prone to desertification and drought. Others (such as countries that rely heavily on income from fossil fuel production and commerce) feel more vulnerable to the potential economic impacts of climate change response measures. The Convention emphasizes activities that promise to answer the special needs and concerns of these vulnerable countries, such as investment, insurance and technology-transfer.
- All Parties to the Convention – those countries that have ratified, accepted, approved, or acceded to it – are subject to general commitments to respond to climate change. They agree to compile an inventory of their greenhouse gas emissions, and submit reports – known as national communications – on actions they are taking to implement the Convention. To focus such actions, they must prepare national programmes containing:
 - Climate change mitigation measures
 - Provisions for developing and transferring environmentally friendly technologies
 - Provisions for sustainable managing carbon 'sinks'
 - Preparations to adapt to climate change
 - Plans to engage in climate research, observation of the global climate system and information exchange Plans to promote education, training and public awareness relating to climate change.

3.2 Preventive approach

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. At the same time carbon dioxide emissions are generated mainly because of conversion of fossil fuels during energy consuming processes. Therefore energy efficiency is part of the solution, besides amongst others substitution of fossil fuels, use of renewable energy, etc., to reduce those emissions. Cleaner Production is the approach to achieve material and energy resources efficiency in processes.

3.3 Baseline activities and current approach

Institutions

The ultimate decision-making body of the Convention is its Conference of the Parties (COP). It meets every year and reviews the implementation of the Convention, adopts decisions to further develop the Convention's rules, and negotiates substantive new commitments.

Two subsidiary bodies meet at least twice a year to carry out preparatory work for the COP:

- The Subsidiary Body for Scientific and Technological Advice (SBSTA) provides advice to the COP on matters of science, technology and methodology, including guidelines for improving standards of national communications and emission inventories.
- The Subsidiary Body for Implementation (SBI) helps to assess and review the Convention's implementation, for instance by analysing national communications submitted by Parties. It also deals with financial and administrative matters.

Furthermore the Intergovernmental Panel on Climate Change (IPCC), an independent body established in 1988, supports the Convention for its (scientific) research. Under the auspices of the World Meteorological Organisation (WMO) and UNEP the IPCC assess the magnitude and timing of climate changes, estimate their potential environmental and socio-economic impacts present realistic strategies for responses. The Panel has issued a series of reports describing the trends in climate change via different scenarios.

Reporting mechanisms

Article 12 of the Convention requires all Parties to report on the steps they are taking to implement the Convention. In accordance with this article, the Conference of the Parties has elaborated several different types of reports and related guidelines and procedures consistent with the common but differentiated responsibilities of Parties.

- National communications (Annex I): periodic submissions by developed countries covering all aspects of implementation
- National communications (Non-Annex I): periodic submissions by Parties not included in Annex I to the Convention on all aspects of implementation
- Greenhouse gas inventories (Annex I): annual submission by developed countries on greenhouse gas emissions and removals
- National Adaptation Programmes of Action (NAPAs): submissions by least-developed countries on their needs and priorities for adaptation

Implementation mechanisms - The Kyoto Protocol to the UNFCCC

The Kyoto Protocol supplements and strengthens the Convention. Only Parties to the Convention can become Parties to the Protocol. The Protocol is founded on the same principles as the Convention and shares its ultimate objective, as well as the way it groups countries into Annex I, Annex II and non-Annex I Parties. It will also share the Convention's institutions, including its two subsidiary bodies and secretariat. The Conference of the Parties will serve as the 'Meeting of the Parties' to the Protocol.

The Protocol's rules focus on:

- Commitments, including legally binding emissions targets and general commitments
- Implementation, including domestic steps and three novel implementing mechanisms
- Minimizing impacts on developing countries, including use of an Adaptation Fund
- Accounting, reporting and review, including in-depth review of national reporting
- Compliance, including a Compliance Committee to assess and deal with problem cases.

In addition to emissions targets for Annex I Parties, the Kyoto Protocol also contains a set of general commitments (mirroring those in the Convention) that apply to all Parties, such as:

- Taking steps to improve the quality of emissions data
- Mounting national mitigation and adaptation programmes
- Promoting environmentally friendly technology transfer
- Cooperating in scientific research and international climate observation networks
- Supporting education, training, public awareness and capacity building initiatives.

The Protocol broke new ground with three innovative mechanisms – joint implementation, the clean development mechanism (CDM) and emissions trading – designed to boost the cost-effectiveness of climate change mitigation by opening ways for Parties to cut emissions, or enhance carbon 'sinks', more cheaply abroad than at home.

1. Clean Development Mechanism

The Clean Development Mechanism (CDM) allows industrialised countries to invest in "clean" projects in developing countries and gain emissions credits. These credits are given in the form of certified emission reductions (CERs), which are expressed in tons of carbon dioxide equivalent. The financing country can use these units to offset its own emissions of GHG during a given period, or sell them to another country. It can also bank them for use during a subsequent period. At the same time the recipient country gains from an increase in investment in sustainable development. This is very much a bottom-up approach: anyone can propose a CDM project. Their proposal will be accepted if it is environmentally sound, satisfies the CDM Executive Board and meets the host country's criteria for sustainable development. The only exceptions are nuclear energy projects for which it is not possible to gain CERs. Another benefit of the CDM is that it can also help the most vulnerable developing countries through the Adaptation Fund to be established under the Protocol: 2% of the proceeds of each project are contributed to this Fund, though the least developed countries are exempt from this requirement.

The CDM executive board was established in 2001 and their main function is to approve methodologies for baseline and monitoring, to register projects and to issue credits. More than 100 methodologies have been received of which, at this moment, 54 methodologies have been cleared for use by projects across a wide range of sectors (e.g. 26 for large scale activities, 19 for small scale activities and 9 specifically for consolidated activities). The board also serves as an accreditation body for 'designated operational entities' (DOEs) – companies which at the global level are permitted to validate and request the registration of projects, to verify and certify resulting emission reductions or removals and accordingly request the issuance of CERs. So far, the Board has accredited 16 companies that can thus now work as its 'extended arms'.

2. Joint Implementation

Joint Implementation (JI) works in a fashion similar to the CDM, except that in this case both countries are Annex I Parties having emission targets under the Protocol. There are two ways in which the projects can be carried out. 'Track 1' is for countries that have effective accounting systems in place, with reliable inventories and registries. Credits can be transferred, as of 2008, without any international supervision. 'Track 2' is for countries that cannot meet these requirements or if the countries prefer this option. In this case, the activity is to be supervised by an international body, the Article 6 Supervisory Committee. This body can accredit companies to act on its behalf as 'accredited independent entities'. Countries interested in this mechanism build on considerable work undertaken during the pilot phase of 'activities implemented jointly' (AIJ) under the Convention. Since 1995 there have been a number of AIJ projects and programmes in many sectors and regions. Official JI projects could not start until the Protocol entered into force, so officially only since early 2005. The Supervisory Committee is now established, and had its first meeting at February 2006.

3. Emission Trading

The principles for emissions trading were established in the Marrakech Accords, whose rulebook determines the Parties that are eligible, the units they can trade, and the reserves that they have to keep. In fact, some – the European Union, Canada and Japan – have already been developing their own trading systems along these lines. The EU launched its system (EU-ETS) on 1 January 2005; CDM credits can be fed into this system from the outset, and JI credits from 2008.

Financial Assistance

Financial resources for the implementation of the Convention are available through the Global Environmental Facility (GEF) Trust Fund, the Special Climate Change Fund (SCCF), the Least Developed Countries Fund (LDCF) and the Adaptation Fund. Funding is also available through bilateral, regional and multilateral channels. These funds will be managed by the GEF in addition to the GEF Trust Fund that also covers the climate change focal area. Since 1991, about US\$ 1.3 billion have been provided in grants from the GEF Trust Fund for climate change activities in developing countries, of this total only 3% was used to fund national communications of non-Annex I Parties. Another US\$ 6.9 billion was contributed through co-financing from bilateral agencies, recipient countries and the private sector, making a total of US\$ 8.2 billion. As part of the Marrakech Accords, the COP advised the GEF to expand the scope of activities eligible for funding, such as work on adaptation and capacity building. Several Annex II Parties have already declared that they will collectively contribute US\$ 410 million a year in extra funding for developing countries by 2005, with this level to be reviewed in 2008. These funds will be managed by the GEF as the entity operating of the Convention's financial mechanism.

- *Adaptation Fund: The Adaptation Fund was established under the Kyoto Protocol to support the implementation of concrete adaptation projects and programmes. The Fund became operational with the entry into force of the Protocol and the GEF is expected to initiate steps to mobilize resources for the Fund.*
- *Least Developed Country Fund: The LDCF will support a work programme to assist LDs to carry out the preparation and implementation of national adaptation programmes of action (NAPAs).*

- Special Climate Change Fund: *The SCCF under the Convention will finance projects relating to adaptation; technology transfer and capacity building; energy, transport, industry, agriculture, forestry and waste management; and economic diversification.*

Bilateral and multilateral funding

In addition to the GEF and its implementing agencies, there are several agencies and institutions that support the implementation of project and programme activities, which facilitated implementation of the Convention. The Convention stipulates that the developed countries should assist developing countries in their efforts to mitigate climate change. One of the most importance channels for this is official development assistance (ODA) both bilateral and multilateral. This may not have seemed a very promising option since overall ODA seemed to be in decline during the 1990s – dropping by 10% between 1990 and 2000. Since then, however there has been a modest revival: flows increased by 7% in 2002 and by a further 4% in 2003.

Many developing countries too have been trying to integrate climate-friendly approaches into their sustainable development strategies while striving to achieve the overriding goal of poverty eradication. For this, however, they need to rely to some extent on external assistance – bilateral and multilateral. Bilateral aid from the OECD countries for climate change over the period 1998–2000 averaged \$2.7 billion per year. The most significant multilateral source has been the Global Environment Facility, which over the period 1995– 2003 allocated for climate change activities about \$1.25 billion and leveraged \$6.2 billion in other funding.

Overview of CDM/JI-financial programmes

Via the World Bank:

- World Bank funds
- Prototype Carbon Fund
- Bio Carbon Fund
- Community Development Carbon Fund
- Netherlands Clean Development Facility
- IFC-Netherlands Carbon Facility
- Italian Carbon Fund
- Spanish Carbon Fund
- Danish Carbon Fund
- Netherlands Clean Development Mechanism (only CDMB)

Multilateral programmes:

- European Bank for Reconstruction and Development Fund (EBRD)
- Nordic Environmental Finance Corporation (NEFCO)
- ICECAP
- European Carbon Fund
- Andean Development Corporation (CAF) – Latin American Carbon Prog.

Bilateral programmes:

- ERUPT and CERUPT Programmes of the Netherlands
- Japan GHG Reduction Fund and Japan Carbon Finance
- IFC's Carbon Facilities
- Rabobank (Netherlands)
- KfW (Germany)

- Climate Investment Partnership
- Canadian Co-operation Fund on Climate Change (managed by AsDB)
- Austrian JI/CDM Programme
- Danish Carbon Programme
- Swedish International Climate Investment Programme
- Finnish CDM/JI Pilot Programme
- Belgium CDM/JI Tender
- New Zealand Projects to Reduced Emissions Programmes

3.4 Present implementation status

Ratification status of the MEA

The UNFCCC is already into force since 1994, but the important related Kyoto Protocol only entered into force relatively recently (February 16, 2005). It was required that at least 55 countries should ratify the Protocol, but more important, also covering more than 55% of the global GHG emissions. Due to the fact that 2 of the main GHG-contributors declined (USA and Australia) declined ratification and the Russian Federation was long time hesitating, the actual start was hampered. The ratification of the Russian Federation in February 2005 finally resulted into action.

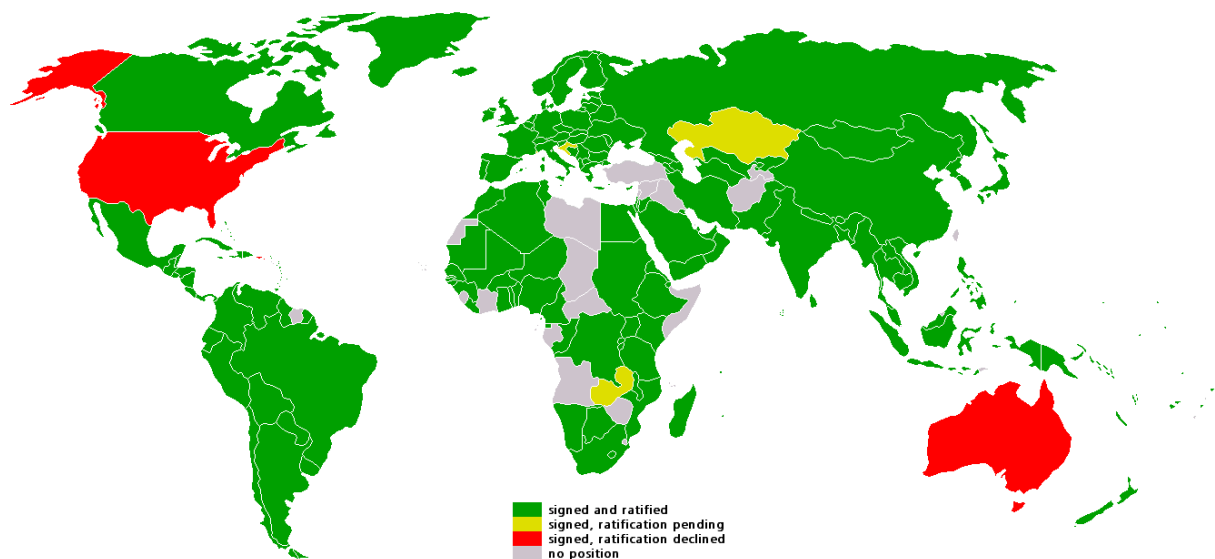


Figure 1 – Global ratification status of UNFCCC

In July 2005 a important parallel strategy was launched, on initiative of the USA, the so-called Asia-Pacific Partnership of Clean Development and Climate (APP), consisting of the 2 major countries that declined ratification of Kyoto (USA and Australia) and 4 major Asian countries (China, India, Japan and South-Korea), all in absolute amount large emitters, and fast growing (especially India and China). To illustrate the importance of this APP-strategy, those 6 countries account at this moment for 50% of the global GHG-emissions!

The APP will develop, deploy and transfer cleaner, more efficient technologies and to meet national pollution reduction, energy security and climate change concern, all consistent with the principles of the UNFCCC, and certainly will not replace the UNFCCC. The major difference is, in comparison to Kyoto, that it is all on voluntary basis and no strict set reduction targets; the main reason why the USA and Australia declined to ratify the Kyoto Protocol.

Emission trends

The bulk of information on emission trends comes from the national communications and greenhouse gas inventories (2 required reporting systems under UNFCCC). These show that for the developed countries as a whole over the period 1990-2001 annual emissions fell by 1.2 billion tons of carbon dioxide equivalent – 6.6% - exceeding the aim of the Convention to return emissions to the 1990 level by the end of the 20th century. However, this was largely due the 39.7% fall in emissions in the countries with economies in transition, as a result of economic contraction, which more than offset a 7.5% rise in the highly industrialised countries.

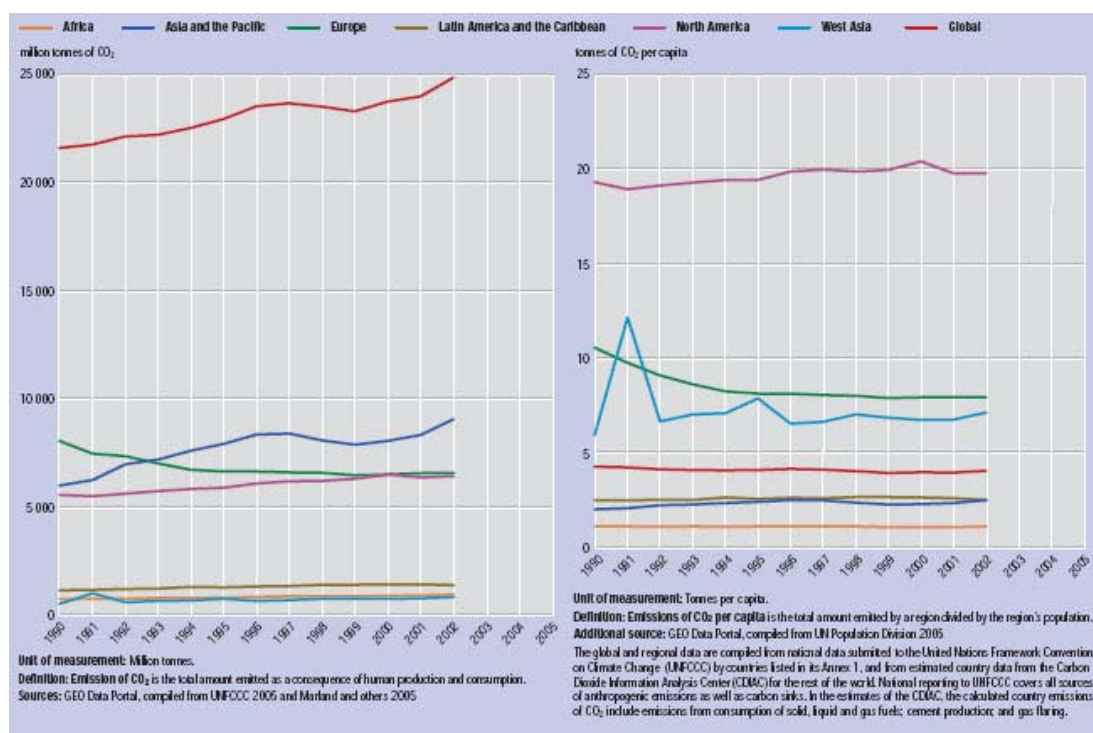


Figure 2 Trend in CO₂-emissions per region since 1990

When we look at that important group of highly developed, and often large emitting, countries we saw in that period still a growth for almost all countries; which large increase figures for amongst others Spain (33.1%), Canada (18.5%), Australia (18.2%), USA (13%) and Japan (9.5%). Only a few countries succeeded to decrease their emissions (e.g. EC as a group (-2.0%), Sweden (-3.1%), UK (-11.7%) and Germany (-18.0%)). The differences partly reflect differences in national circumstance. Economic

growth, for example, has been much faster in some countries than others, and this can be associated with rises in emissions. Other underlying factors include rates of population growth and patterns of energy supply and use. However the difference also partly reflect the extent to which these countries have taken steps to reduce emissions. These involve direct effort to mitigate emissions as well as policies that work indirectly: some countries have, for example, liberalised their energy supply industries with the result that coal, a major sources of carbon dioxide, has been substituted with gas. Especially the successful reductions in emissions in Germany and the United Kingdom manifest successes of such policies.

If we also look at the recent trends in the non-Annexe I countries, we can see that some developing countries are taking steps to mitigate climate change, though often have done so indirectly through other policies. By carrying out market reforms and economic restructuring, for example, they have ensured that energy prices better reflect true costs, leading to energy efficiency. And by promoting more broadly based and secure sources of energy they have boosted energy efficiency and reduced the use of carbon-intensive fossil fuels. Similarly, efforts to sustain forests in order to protect water supplies and agricultural land have also had benefits of increasing carbon sequestration. Rapid economic growth is accompanied by increases in energy-related carbon dioxide emissions. Between 1990 and 2000, energy related carbon dioxide emissions grew in developing countries that held a noticeable share of world emissions (IEA 2003). In Indonesia these emissions increased by 101%, in the Republic of Korea by 86%, in India by 69% and in Brazil by 57%. Only in three of these countries was growth in emissions relatively slow: in South Africa 17%; Venezuela 22%; and China.

China too has seen emissions grow, if fairly slowly. China occupies an important position: even though the growth in emissions has been smaller, given the country's size its absolute emissions are substantial – amounting in 2000 to three billion tons of carbon dioxide equivalent. Nevertheless China has been making determined efforts to increase energy efficiency. Indeed, over some periods China has seen its emissions drop, as between 1998 and 1999 when they fell by 4%. This will have been due partly to a reduction in output linked to the Asian financial crisis but the Government has also undertaken radical reforms in the energy sector with a strong focus on energy efficiency and conservation. As a result in the 1990s China's energy use efficiency doubled. China and other developing countries have a number of options for improving energy efficiency and conservation. This include amongst others cogeneration; in the case of gas turbines, for example, this means not just using the turbine to generate electricity but also collecting and using energy from the heat exhaust. Countries can also improve the efficiency of their thermal electricity generation, their hot water supply systems and their appliances, and they can try to reduce losses in electricity transmission and distribution.

Reporting

A crucial analysis of the trends in emissions in different regions and their policies and strategies are the so-called national inventories of GHG's and national communications. Annexe I countries already submitted around 2001-2002 their third national communications on the implementation of the Convention. At that moment only 11 non-Annexe I countries could provide such a first report. However, a very positive trend can be seen since 1999. Between 1999-2003 the number is increased to 111, of which 83 gave complete coverage by gas and by sector. Some have even turned their attention

already to their second communication: by 2003 Korea and Mexico already presented these, while Argentina, Costa Rica and Uruguay were working on it.

Stakeholder involvement

The developed countries already have the institutions to address issues related to sustainable development or have the resources to launch new ones. In developing countries one of the main limitations on these activities is the shortage of financial and human resources. An essential component of sustainable development must therefore be capacity building – strengthening national institutions and human capacity so that they can better analyse existing vulnerabilities and problems and take the necessary action.

Dealing with climate change is not the sole responsibility of central government. Many developing countries are now seeing greater involvement from other stakeholders, including local governments, industry federations, scientific institutions and NGOs. In some cases they have participated through membership of national advisory bodies, which in Botswana, for example, is the National Committee on Climate Change, while others have participated through international networks such as Cities for Climate Protection or the World Business Council for Sustainable Development. Individual enterprises can also make direct contact with other bodies overseas: environmental consulting firms in a number of developing countries have started to prepare Clean Development Mechanism projects and are looking for potential investors from abroad. Despite these encouraging signs, many countries have yet to build a sound institutional framework. A number have yet even to report on their institutional arrangements or have pointed out that their systems are weak. In its national communication Morocco, for example, stresses that it needs to strengthen institutions dealing with vulnerability and adaptation, databases and systematic observation. Albania points out that responsibility for environmental monitoring is still dispersed across several government departments – which result in significant overlaps and inconsistencies. Kenya too concludes that its climate change institutions are constrained at all levels by inadequate capacity and weaknesses in linkages and networking. The Consultative Group of Experts on National Communications has confirmed the problems identified by individual countries from non-Annex I Parties that also recommends institutional strengthening in the area of vulnerability and adaptation assessment.

Actions taken so far by (local) governments

In addition to stimulating voluntary action, governments have a variety of options – fiscal, economic and regulatory – through which they can encourage patterns of production and consumption that can minimize emissions of greenhouse gases. At first their policies tended to be rather fragmented; now they are becoming more coherent and integrated. Even as the Convention was coming into force many developed countries were already taking action to combat climate change. Generally they did so primarily for economic motives – as they tried to improve energy efficiency. Their initial activities could thus be considered as 'no-regrets' measures whose benefits exceeded their costs even without taking into account their merits for climate change. A number of governments had, for example, saved money by cutting subsidies to energy and agriculture – measures that also helped reduce emissions of carbon dioxide from the energy sector and emissions of methane and nitrous oxide from agriculture. Some developed countries had also deregulated and liberalized their energy markets to sharpen competition and make

energy production and distribution more efficient – which also had beneficial effects for climate change. An integrated approach for the developed countries had also become more coherent – largely as a result of the Kyoto Protocol, which encouraged a more integrated approach. Some of the key components of this new approach were:

Building a policy portfolio – Obtaining maximum gains in mitigation requires a wide range of complementary instruments. In the case of energy, for example, this could include combining carbon dioxide taxes and new policies to implement emissions trading with policies to promote public transport, while at the same time devising a mix of preferential tariffs, grants and tax exemptions to promote renewables. The mix of policies within the portfolio will depend on national circumstances, though the balance tends to be similar across groups of countries – as across European compared with developed countries outside Europe.

Wider participation – This integrated approach works best when it is based on extensive consultation and collaboration – between central, local and regional governments and also includes other major stakeholders and targeted groups. More comprehensive coverage – Most countries have moved on from an initial concentration on carbon dioxide emissions from the energy sector to a more comprehensive approach that deals with six greenhouse gases and addresses all sources of emissions, as well as the potential for removals by sinks. Indeed businesses have often been keen to deal with other gases, for which there are technological alternatives whose use could bring not just environmental but also economic gains.

Instruments - In implementing their climate change policies they have been using a wider variety of instruments. These include:

- Economic and fiscal instruments
- Market instruments, such as emissions trading
- Voluntary and negotiated agreements
- Regulations and standards
- Information, education and public awareness
- Research and development

The most important instruments are still economic and fiscal. However the mix and balance of instruments varies from country to country. The instruments can also vary from sector to sector: thus in the waste sector regulations are more prevalent, while energy use in industrial processes is more likely to be governed by voluntary agreements, though the pattern is changing in Europe where one of the principal instruments within industry in future is likely to be emissions trading.

Technology transfer

If developing countries, with limited research capacities of their own, are to take advantage of many of these new developments they rely on technology transfer. This need for technology transfer was emphasized in 1992 in Agenda 21, for example, and the UNFCCC Convention in Articles 4.3, 4.5 and 4.7 and since then issue has been pursued at a number of meetings

The work of the COP culminated in a 'technology framework' that was finally agreed in 2001 at the seventh Conference of the Parties in Marrakech. The framework covers five key themes and areas for action:

- Technology needs and needs assessments
- Technology information
- Enabling environments
- Capacity-building

○ Mechanisms for technology transfer

The Expert Group on Technology Transfer (EGTT) has been established and has been considering technology needs. Furthermore methodologies for needs assessments have been developed, a technology transfer information-clearing house has been launched, a network of information centres has been created and a list has been drawn up of activities needed for capacity building.

Financial flows that drive technology transfer:

- Official Development Assistance (ODA): important for those parts of the world and sectors where private sector flows are comparatively low, like agriculture.
- Foreign Direct Investment (FDI), commercial lending and equity investments: means by which the private sector make technology-based investments in developing countries and countries in transition, often in the industry, energy supply and transportation sectors.

Progress in CDM-projects

The CDM-activities are growing fast, as can be illustrated by the number of proposed activities (from June 2005 to November 2005 grown from 150 to 470), but also the number of validated projects, and the grown organisational structure required for actual implementation of CDM (e.g. the number of Designated National Authorities, at this moment already in place in over 70 non-Annexe I countries) and the active service providers and assigned training workshops in those countries.

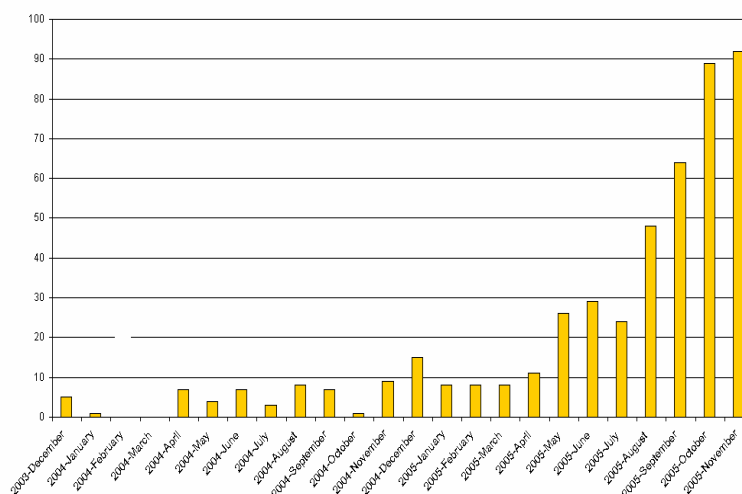


Figure 3 – Number of validated CDM-projects since 2003

However at the same time we see a big regional difference, e.g., mainly Asia and Latin America and Africa almost non-existence, and in the Asian and Latin American countries a few countries dominate the figures (e.g. in Asia mainly India and in Latin America mainly Brazil and Mexico).

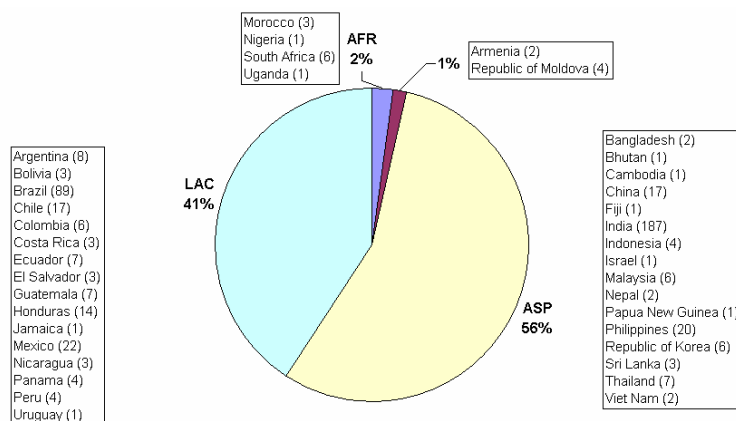


Figure 4 – Designated National Authorities per region

3.5 Problems / barriers

- *Data and information* for compiling National inventories, and based on that National communications: most problems related to the scarcity and quality. This is exacerbated by lack of capacities and expertise to access, collect, analyse, manipulate and manage the data and databases necessary to conduct these studies and analyses. The assessment of potential mitigation options was constrained by the lack of relevant data and information. Where data were available they were not relevant for sector- and country-specific mitigation analysis.
- *IPPC methodologies and other models*: methodological problems are caused by not taking into account the specific national circumstances, lack of national capacity/expertise to develop and/or use social-economic scenarios and lack of financial resources for assessment work. Where potential adaptation options were identified, many Parties did not evaluate, prioritize and cost these adaptation options due to a lack of analytical tools, specific studies and expertise to undertake cost-benefit analysis on adaptation options.
- *Institutional arrangements, information and networking*: a major constraint is the lack of appropriate institutional arrangements, which includes effective coordination, limited awareness, necessary legal and institutional authority, human capacity, and the absence of universities and/or research centres. Furthermore the exchange of information and networking were generally weak due to limited human and financial resources, limited data and information, and underdeveloped systems to process the data.
- *Research and systematic observation, education, training and public awareness*. The lack of sufficiently trained scientific and technical personnel, policy makers and the institutions to carry out research and training on climate change issues have caused a minimal awareness and education among the public at large and the policy makers, limited coverage of climate issues by the media, lack of active participation by non-governmental organizations, limited technical advice and support material.
- *Resources: human, technical and financial*. Limited financial resources, insufficient and inappropriate tools, limited sectoral coverage, insufficient capacity and expertise, lack of experience to coordinate, implement and participate in climate change activities efficiently at the national, subregional regional and international levels, were all highlighted

3.6 Can CP (further) contribute to the implementation process?

3.6.1 Best practices

GHG emissions in industry are mainly related to energy consumption. Energy is an important input to industry and one that provides considerable scope for cutting costs. It is estimated, based on successful demonstration projects, that savings of 20-25 percent are achievable with existing equipment and other 30-60 percent could be saved if investments are made in new, more efficient capital equipment.

Cleaner Production (CP) is now widely recognised as an effective way of addressing material and energy resource productivity. The link with creation of waste is an easy one to make and waste is easily recognised as a source of environmental pollution. Where energy is concerned, the link is less often made. However, if overall objectives of resource conservation, environmental preservation, competitive advantage and sustainable development are to be achieved, energy efficiency (EE) must become an integral part of a total systems approach. CP, as an integrated preventive environmental strategy, is the ideal framework in which to incorporate such an approach. CP and EE are two complementary avenues, which, if combined, offer synergistic benefits that will lead to both environmental and economic progress.

Several good specific energy efficiency assessment tools / guidelines have been developed and applied in the past years; f.i. in the UK-financed SADC Industrial Energy Management Project for Southern African countries and the USA-EPA Energy Efficiency projects. In recent years already some good initiatives have been taken to strengthen the incorporation of energy efficiency in Cleaner Production; e.g. UNEP/GEF's pilot project 'Cleaner Production and Energy Efficiency (in 6 countries, Slovak and Czech Republic, Hungary, India, China and Vietnam) and especially the Asian Project GERIAP / Greenhouse gas Emission Reduction from Industry in Asia and the Pacific (www.geriap.org), resulting in excellent assessment tools and successful case studies. In addition the UNEP-developed tool 'GHG Calculator' is very useful to calculate the actual GHG-emission reductions achieved in such successful energy assessment.

Generating of CP-EE options is similar to the process for a 'conventional' Cleaner Production approach: e.g. identifying where process (in this case energy consumption) inefficiencies take place, analyse why those inefficiencies occur and generate options to change. The key areas of energy consumption in industry are thermal equipment, electrical equipment and process utilities, with the crucial remark that energy assessment should not focus only to optimise / improve the performance of the equipment (an approach traditional energy experts often take) but also investigate, as a good CP-assessment enhances, process-integrated measures, if f.i. the volume of hot water in process can be reduced, if the temperature in the process can be better control (avoid overheating), etc.

As an illustration of options a wider menu of possible avenues for CP-EE is presented, extends to energy conversion equipment and end use, including:

- Stack gas losses.
- Excess air (reduce to minimum requirement depending on burner technology, operation (i.e. control) and maintenance).
- Stack gas temperature (reduce by optimising maintenance (cleaning), load, or by better burner and boiler technology).

- Losses in unburned fuel in stack and ash (optimise operation and maintenance; use better burner technology).
- Blowdown losses (treat fresh water; recycle condensate).
- Losses with condensate (recover largest possible amount of condensate).
- Convection and radiation losses (better boiler insulation).

There are also some situations in which retrofit or system optimisation is possible:

- The original system was intended for a continuous process but is operated for a batch process (e.g. furnaces).
- Baseline costs of fuel and power have increased to the point where investment in improved energy efficiency is now justified.
- Waste recovery for boilers/heaters.
- Economic thickness of thermal insulation.
- Economic pipe size for pumping and compressed air distribution systems.

Operating parameters may change with regard to the original design:

- Changes in parameters such as cooling water temperature and quality or ambient air conditions can influence cooling system performance and thereby affect energy efficiency and system productivity.

Energy efficient technologies can be considered, for example:

- Ceramic fibre lining for better thermal insulation.
- Absorption chillers, as a non-CFC alternative to conventional compression chillers.
- Fluidised bed boilers using low calorific value, inferior fuels.
- Variable frequency (variable speed drives for capacity controls).
- Conventional lighting equipment and control systems can be replaced by state-of-the-art units.
- Sun-film can be applied to windows to minimise solar gain.
- Renewable energy sources can be used.
- Fuel additives.
- Process catalysts.
- Soft-starters for electric motors.
- Slip power recovery systems for slip-ring motors, etc.

Energy efficient matching of end use equipment can also be effective, e.g.:

- Elimination of throttling of pumps by:
 - impeller trimming;
 - resizing of pumps;
 - installing variable speed drives.
- Elimination of damper operations for fans by:
 - impeller derating/trimming;
 - installing variable speed drives;
 - modifying pulley diameters for belt drives;
 - resizing of fan for better efficiency.
- Moderation of temperature of chilled water temperature for process requirements.
- Recovery of energy lost in control valve pressure drops by adopting back-pressure/turbines.
- Use of task lighting in areas where lighting is less effective.

End-use energy efficiency can be maximised by, for example:

- Improving traps to eliminate steam leaks.
- Maximising condensate recovery.
- Maximising combustion efficiency by adopting of combustion controls.
- Replacing pumps, fans, compressors, refrigeration compressors, boilers, furnaces, heaters and other energy converting equipment wherever significant energy-efficiency margins exist.

- Ensuring rated electrical parameters at motor terminals.
- Maximising heat recovery between systems (e.g. using heat recovered from air compressor to pre-heat water).

3.6.2 Best strategies

Analysing, amongst others, the UNFCCC Report 'The First Ten Years' (2004), available UNFCCC National Communications and the report 'Transfer of Environmentally Sound Technologies and Practices under the Climate Convention. Survey of Experiences, needs and opportunities among non-Annex II countries' (IVAM, Amsterdam, 1998) we can see a pallet of best (policy) strategies for tackling the climate change issue.

<p>Legislation</p> <ul style="list-style-type: none"> ○ Regulations, (renewable or energy efficiency targets per sector) ○ Standards on appliances 	<p>Financial</p> <ul style="list-style-type: none"> ○ Energy and carbon dioxide taxes ○ Green taxation ○ Electricity subsidies ○ Subsidies for renewable energy ○ Green certificates / emission trading
<p>Technical</p> <ul style="list-style-type: none"> ○ Research and development ○ Capacity building ○ Assessment guidelines ○ Overviews of BAT's 	<p>Communication</p> <ul style="list-style-type: none"> ○ Voluntary agreements ○ Information ○ Education ○ Public awareness

Some examples per strategy category:

- **Regulations:** In anticipation of enactment of federal legislation on energy management for industry, the State of Kerala in southern India made energy audits mandatory for large-scale, energy consuming industries.
- **Standards:** Many countries have introduced standards for appliances, amongst others for energy efficiency. These have been supplemented by tax measures, labelling and information campaigns. Such standards are also existing for the building sector; set a minimum level of thermal resistance for walls, glass windows, etc. and minimum level of efficiency for heaters, air conditioning etc.
- **Energy and carbon dioxide taxes:** This is one of the most common instruments, introduced in the early nineties, and steadily increasing the tax rates – or extending their coverage.
- **Green taxation:** A number of EU-countries, including Denmark, France, Germany, Sweden and the UK, are moving towards 'green taxation, thus shifting the tax base away from labour and income towards physical items such as energy, minerals and pollution. This strategy is however under tension, and therefore suspended, due to the significant recent increases in the world oil and gas prices.
- **Electricity subsidies:** Many (European) countries have been reforming their energy sectors, aiming to boost economic efficiency – by increasing private-sector participation, by heightening competition in energy supply and distribution

and by giving consumers greater choice in their energy suppliers. As part of these reforms they have also been reducing subsidies for the production or consumption of energy, particularly those using fossil fuels. However still many developing countries subsidising energy / electricity and thereby sending contra productive signals to energy efficiency initiatives.

- **Subsidies for renewable energy:** In order to support the rapid increase of its renewable energy market countries like Germany and Spain launched a complex system of direct subsidies, low interest loans, and financial incentives.
- **Green certificates / emission trading:** Sweden's Green Certification Scheme gives energy producers one certificate per megawatt-hour of energy that they produce from renewable sources. Industrial energy consumers then have to buy these certificates to cover a set proportion of their use.
- **Research and development:** Numerous initiatives are ongoing for improving 'old technologies' and adapt them to be used to circumstances in developing countries, continuous development of 'recently new technologies, like renewable energy to make them available for affordable prices and deployment of more efficient or complete new, break-through technologies, for example in hydrogen and fuel cell technologies. Multimillion-dollar programmes have been launched.
- **Capacity building:** In most countries capacity building is taken place to strengthen local capacity with regard to Cleaner Production (growing network of centres) with more and more adequate coverage also of energy (see the project mentioned before in Asia and CEE). And furthermore a lot of donor-projects but also 'semi-commercial' training activities are launched to create a market for CDM and JI-projects. Donor-projects assist to set up local capacity (amongst others several AsDB-projects), and bilateral awareness raising and introduction workshops are launched by the respective countries that opened a CDM/JI-financing scheme, and the active consultants and certifying bodies in the CDM/JI field also offer low-cost training programmes in order, partly at self-interest, to boost the market for good proposals.
- **Assessment guidelines:** Excellent training / assessment guidelines are available from UNEP/GEF's pilot project 'Cleaner Production and Energy Efficiency (in 6 countries, Slovak and Czech Republic, Hungary, India, China and Vietnam) and especially the Asian Project GERIAP / Greenhouse gas Emission Reduction from Industry in Asia and the Pacific
- **Overviews of BAT's:** The Convention itself maintains a good clearinghouse with regard to technology measures (TTClear) and building up a clearinghouse of success-stories from its CDM and JI-projects. Furthermore very adequate information can be withdrawn from the so-called BREF's (BAT Reference documents) under the EU-IPPC Directive (Integrative Pollution Prevention and Control) describing excellent the state-of-the-art technology (also including energy and GHG-issues) of all major industrial sectors.
- **Voluntary agreements:** The Netherlands has now a history of voluntary agreements for more than a decade – with encouraging results. Also with regard to energy efficiency. They have so-called Long Term Sectoral Agreement on

Energy. Companies that join such an agreement have the measures mentioned in the Agreement integrated into their environmental permit-setting process. Companies that choose not to join the agreements, on the other hand, are obliged by the authorities to undertake every energy-saving measure that has an IRR of a least 15% after tax (so a more stringent requirement). These agreements do not apply to companies in energy-intensive sectors. These sectors have voluntarily committed themselves to being among the world's most energy-efficiency business in their sector (checked via a benchmarking system), and if not complying will be enforced to implement measures on a short term in a stringent way.

- **Information:** Tailored information networks and clearing houses have been established. As part of UNFCCC itself the Technology Information Clearing House (TT:CLEAR) is launched to improve access to information on environmentally sound technologies, offering valuable information to governmental specialists and practitioners as well as to public-interest groups, businesses, trade associations and intergovernmental organisations.

3.7 Conclusions

Based on the analysis of the implementation process of the UNFCCC, the results achieved so far, and the 'missed chances' to utilise the CP-concept in implementing the UNFCCC Convention we can conclude the following:

- ❖ Growing consensus on relevance and importance to tackle and mitigate climate change;
- ❖ All stakeholders underline the importance of energy efficiency;
- ❖ There is a growing local capacity in developing countries to comply with the required 'simple' MEA-obligations (see the trend of availability of national communications);
- ❖ The utilisation of the Kyoto-protocol mechanisms (JI, CDM) offer opportunity to co-finance investments;
- ❖ Due to delay in the political process with regard to Kyoto is the actual implementation of CDM and JI-projects in most regions still in an early stage;
- ❖ At country level still insufficient knowledge is available, especially related to direct services for enterprises, how to prepare eligible CDM / JI – proposals on energy efficiency in industrial processes;
- ❖ At the same time a decoupling trend between economic growth and energy consumption is not really been seen in developing countries, and also in the developed countries the targeted GHG-reduction is not achieved yet, nor expected soon;
- ❖ Cleaner Production, when applied correctly has proven that energy efficiency is a successful concept for industry;
- ❖ GHG-reduction via energy efficiency can be a win-win, savings due to less energy consumption (economic, decreased costs) and CO₂-reduction (environment);
- ❖ However most energy consultants focus merely on the energy consuming activities and overlook the potential energy savings via process integrated measures, and on the other hand cleaner production consultants are merely

- material balance focused with limited attention to energy balance analyses and tend to forget to calculate potential CO₂-reduction;
- ❖ Attention is given to readjust this unbalanced / sub-optimal analysis of industrial processes via so-called CP-EE-projects (e.g. pilot projects in UNEP/GEF and GERIAP);
 - ❖ Cleaner Production can contribute significantly, when applied properly, to reduce GHG-emissions and thereby contribute to the implementation of the MEA;
 - ❖ And at the same time CP could utilise the existence, awareness and priority for the MEA at national policy level as leverage.

Chapter 4 – Basel Convention

4.1 Main objectives and goals

The overall goal is 'to protect, by strict control, human health and the environment against the adverse effects which may result from the generation and management of hazardous wastes and other wastes'.

This is further elaborated in the following articles:

(1)

- a) Parties exercising their right to prohibit the import of hazardous wastes or other wastes for disposal shall inform the other Parties of their decision pursuant to Article 13.
- b) (b) Parties shall prohibit or shall not permit the export of hazardous wastes and other wastes to the Parties, which have prohibited the import of such wastes, when notified pursuant to subparagraph (a) above.
- c) Parties shall prohibit or shall not permit the export of hazardous wastes and other wastes if the State of import does not consent in writing to the specific import, in the case where that State of import has not prohibited the import of such wastes.

2. Each Party shall take the appropriate measures to:

- a) 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;
- b) Ensure the availability of adequate disposal facilities, for the environmentally sound management of hazardous wastes and other wastes, that shall be located, to the extent possible, within it, whatever the place of their disposal;
- c) Ensure that persons involved in the management of hazardous wastes or other wastes within it take such steps as are necessary to prevent pollution due to hazardous wastes and other wastes arising from such management and, if such pollution occurs, to minimize the consequences thereof for human health and the environment;
- d) Ensure that the transboundary movement of hazardous wastes and other wastes is reduced to the minimum consistent with the environmentally sound and efficient management of such wastes, and is conducted in a manner which will protect human health and the environment against the adverse effects which may result from such movement;
- e) Not allow the export of hazardous wastes or other wastes to a State or group of States belonging to an economic and/or political integration organization that are Parties, particularly developing countries, which have prohibited by their legislation all imports, or if it has reason to believe that the wastes in question will not be managed in an environmentally sound manner, according to criteria to be decided on by the Parties at their first meeting;
- f) Require that information about a proposed transboundary movement of hazardous wastes and other wastes be provided to the States concerned, according to Annex V A, to state clearly the effects of the proposed movement on human health and the environment;
- g) Prevent the import of hazardous wastes and other wastes if it has reason to believe that the wastes in question will not be managed in an environmentally sound manner;

- h) Co-operate in activities with other Parties and interested organizations, directly and through the Secretariat, including the dissemination of information on the transboundary movement of hazardous wastes and other wastes, in order to improve the environmentally sound management of such wastes and to achieve the prevention of illegal traffic.

Reading the preamble, the objectives and obligations one can see that the Convention can be described via 3 key objectives:

1. To **reduce transboundary movements** of hazardous wastes to a minimum consistent with their environmentally sound management;
2. To **dispose** hazardous waste is the best environmental way (including the workers conditions involved in waste handling):
3. To **minimise the generation** of hazardous wastes in terms of quantity and hazardousness

4.2 Preventive approach

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 (1999), further strengthened the Convention's objective to prevent and minimise waste generation, and to promote transfer and use of cleaner technologies. And this emphasis was again stressed upon via its *Strategic Plan for the Implementation of the Basel Convention 2000 – 2010* [discussed at COP-6, Geneva 2002], mentioning:

- a) Prevention, minimization, recycling, recovery and disposal of hazardous and other wastes subject to the Basel Convention, taking into account social, technological and economic concerns
- b) Active promotion and use of cleaner technologies and production, with the aim of the prevention and minimization of hazardous and other wastes subject to the Basel Convention:
- c) Improvement and promotion of institutional and technical capacity-building, as well as the development and transfer of environmentally sound technologies, especially for developing countries and countries with economies in transition:
 - Development of waste prevention and minimization programmes and tools
 - Assistance in the development and implementation of national legislation and institutional and policy frameworks, including a legal base for enforcement and for the conduct of inventories and related activities, such as waste audits
 - Development and enhancement of national capacity for the preparation and conduct of detailed inventories as well as waste audits for priority waste streams to assist in disposal/recovery operations and in the prevention and minimization of such wastes
 - Implementation of national legislation and policies, use of technical guidelines, and conduct of detailed inventories for the environmental sound management of priority waste streams

- Review of national infrastructural needs and preparation and implementation of national waste prevention/ minimization and management plans
- Implementation of waste prevention and minimization programmes
- Development of enhanced capacity for the environmentally sound recycling or recovery of hazardous wastes

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".

4.3 Baseline activities and current approach

Affiliated instruments

Related to the Basel Convention 3 affiliated instruments are important to mention:

- *Basel Ban*: Amendment on the control of transboundary movements of hazardous wastes and their disposal. In order to ban exports of hazardous wastes for final disposal, recovery, or recycling from listed in Annex VII (mainly OECD countries) to states not listed in Annex VII (mainly non-OECD countries)
- *Liability Protocol*: Protocol on liability and compensation for damage resulting from transboundary movements of hazardous waste and their disposal. To provide a comprehensive regime for liability as well as adequate and prompt compensation for damage resulting from the transboundary movement of hazardous wastes and other wastes, including incidents occurring because of illegal traffic.
- *Basel Ministerial Declaration on ESM of hazardous waste*: "Take all practical steps to ensure that hazardous waste or other waste is managed in a manner which will protect human health and the environment against the adverse effects which may result from such waste." In order to give special attention to prevention and minimisation of hazardous and other waste (= CP mandate) and requires capacity building, policy reforms and promotion and use of cleaner technologies and production methods.

Implementation mechanisms

The Conference of Parties and a number of subsidiary bodies govern the Convention. 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. 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.

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".

Strategic plan for the implementation of the Basel Convention (to 2010)

The Strategic Plan builds on and uses the framework of the 1999 Ministerial Basel Declaration on Environmentally Sound Management, as it identifies and describes those activities considered achievable by the Parties in partnership with all concerned and interested stakeholders within the agreed 10-year time frame. The Strategic Plan takes into account existing regional plans, programmes or strategies, the decisions of the Conference of the Parties and its subsidiary bodies, ongoing project activities and processes of international environmental governance and sustainable development. The Strategic Plan is composed of a strategic text and Action Table comprised of short (2003-2004) and mid-to-long term activities (2005-2010). The strategic plan was adopted in 2002.

During The Next Decade (2000-2010), the Convention will build on this framework by emphasizing full implementation and enforcement of treaty commitments. The other area of focus will be the minimization of hazardous waste generation. Recognizing that the long-term solution to the stockpiling of hazardous wastes is a reduction in the generation of those wastes - both in terms of quantity and hazardousness - Ministers meeting in December of 1999 set out guidelines for the Convention's activities during the Next Decade, including:

- Active promotion and use of cleaner technologies and production methods;
- Further reduction of the movement of hazardous and other wastes;
- The prevention and monitoring of illegal traffic;
- Improvement of institutional and technical capabilities -through technology when appropriate - especially for developing countries and countries with economies in transition;
- Further development of regional and sub regional centres for training and technology transfer.
- The Goal of Minimizing Hazardous Wastes

Compliance and enforcement mechanisms

The Basel Convention contains specific provisions for the monitoring of implementation and compliance. A number of articles in the Convention oblige Parties to take appropriate measures to implement and enforce its provisions, including measures to prevent and punish conduct in contravention of the Convention.

The system that controls the movement of hazardous waste

Because hazardous wastes pose such a potential threat to human health and the environment, one of the guiding principles of the Basel Convention is that, in order to minimize the threat, hazardous wastes should be dealt with as close to where they are produced as possible. Therefore, under the Convention, transboundary movements of hazardous wastes or other wastes can take place only upon prior written notification by the State of export to the competent authorities of the States of import and transit (if appropriate). Each shipment of hazardous waste or other waste must be accompanied by a movement document from the point at which a transboundary movement begins to the point of disposal. Hazardous waste shipments made without such documents are illegal. In addition, there are outright bans on the export of these wastes to certain countries. Transboundary movements can take place, however, if the state of export does not have the capability of managing or disposing of the hazardous waste in an environmentally sound manner.

National Reporting of Hazardous Wastes

Each country that is a Party to the Convention is required to report information on the generation and movement of hazardous wastes. Every year, a questionnaire is sent out to member countries, requesting information on the generation, export and import of hazardous wastes covered by the Convention. This information is reviewed and compiled by the Secretariat and is presented in an annual report, which includes statistical tables and graphic representations of the data. These documents are available at www.basel.int/

Technical Assistance Offered by the Convention

In order to assist countries (as well as interested organizations, private companies, industry associations and other stakeholders) to manage or dispose of their wastes in an environmentally sound way, the Secretariat cooperates with national authorities in developing national legislation, setting up inventories of hazardous wastes, strengthening national institutions, assessing the hazardous waste management situation, and preparing hazardous waste management plans and policy tools. It also provides legal and technical advice to countries in order to solve specific problems related to the control and management of hazardous wastes. In the case of an emergency, such as a hazardous waste spill, the Secretariat cooperates with Parties and relevant international organizations to provide rapid assistance in the form of expertise and equipment.

Implementation actors

Convention level:

- Conference of parties (COP)
- Expanded bureau: provides general policy and general operational directions to the Secretariat between meetings of the COP
- Working groups: Working group for the implementation of the Basel Convention, Technical Working group and legal working group.
- The secretariat: co-operation with national authorities, inventories, institutional strengthening, preparing hazardous waste management plans and policy tools.
- The Committee on Partnership with industry: will advise on the development of the strategy on co-operation with industry in priority waste streams

National level:

- Focal point: receives and transmits information as required by the Convention to and from the COP;
- National competent authority: governmental authority responsible for receiving the notifications of transboundary movements of waste.

Regional level:

- Basel Convention Regional Centres (BCRCs)

Basel Convention Regional Centres (BCRCs):

An integral part of implementing the Basel Convention is building the capability to manage and dispose of hazardous waste. Through training and technology transfer, developing countries and countries with economies in transition gain the skills and tools necessary to properly manage their hazardous wastes. To this end, the Basel Convention has established the BCRCs:

- Providing guidance on technical, technological issues and legal issues;

- Advice on enforcement aspects of Basel Convention and related Conventions, such as Stockholm;
- Encourage introduction of Cleaner Production technologies and environmentally sound waste management practices;
- Enhancement of information exchange, education and awareness raising.

Presence:

- For the African region: Egypt, Nigeria, Senegal and South Africa;
- For the Asia and Pacific region: China and Indonesia;
- For the Central and Eastern European region: the Slovak Republic and the Russian Federation;
- For Latin America and the Caribbean region: Argentina, El Salvador, Trinidad and Tobago and Uruguay.

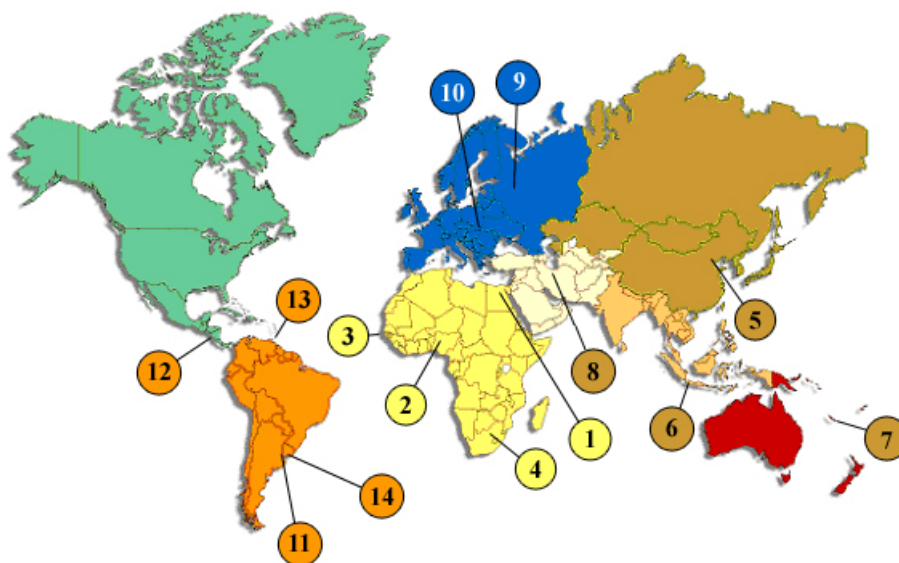


Figure 5 – Basel Convention Regional Centres (BCRCs)

So far BCRC are not really linked with and co-operating with the network of CP Centres, but first steps have been set to engage BCRC's in partnerships with National Centres for Cleaner Production (NCCP), like

- Project for the management of spent lead-acid batteries in Central America
- Pesticide Formulation Plant Project
- Joint training activities in CEE-countries

4.4 Present implementation status

The Basel Convention is already into force since 1992, with at present 152 countries that ratified the Convention. The most non-ratified countries are situated in Africa, and, in line with their position on MEAs, the USA.

However it is important to notice that the affiliated instruments linked to the Basel Ban not have been ratified yet:

- The Basel Ban needs 75% coverage, or 62 countries. At this moment 61 countries, and the main dispute argument from the opposing countries (like

- Australia, Canada, but also mentioned by the USA) is the GATT/WTO-inconsistency and the trade-disruptive
- The Liability Protocol needs 20 ratifications to enter into force. At the moment 13.

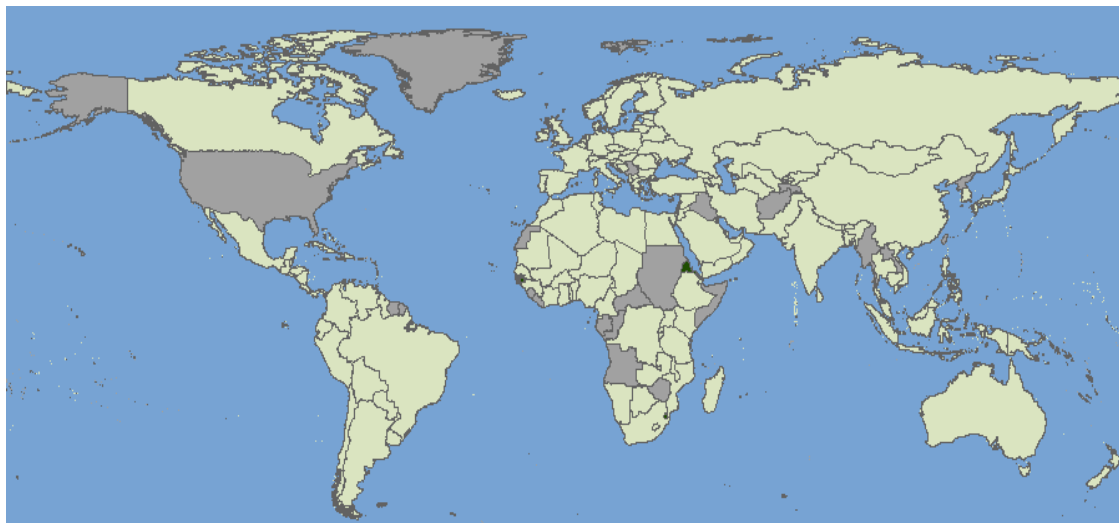


Figure 6 – Global ratification status of the Basel Convention

No actual global data are available on the quantity / volumes and hazardous of waste streams globally, nor on specific regions. The Basel Convention annually requires filling in a questionnaire also asking for these kinds of data, but so far especially in developing countries no adequate data collection and reporting systems is available. Adequate data are only available for most developed countries, amongst others via those questionnaires, but also in the context of EEA-data collection.

However it is generally acknowledged that the volume of hazardous waste globally is still growing. The Basel Convention has achieved good results in controlling hazardous waste movements. At the moment still approximately 16 million ton hazardous waste is transported from one country to another, but merely properly controlled, and in compliance with the Basel Convention rules. No adequate data are available on the illegal trafficking; but happening certainly less frequently as in the eighties and nineties, but certainly not phased out. Recently again some apparently properly controlled shipments were unmasked by environmental NGO-actions, and border controlled as out of compliance, due to illegal mixing of waste streams.

However, the still growing total volume of hazardous is alarming. At the COP-meeting in Geneva October 2004 Klaus Topfer, the Executive Director of UNEP stated "hundreds of millions of tonnes of hazardous waste are generated globally every year – and the quantities are rising. Reversing this upward trend over the next few decades will require a new industrial revolution that decouples waste generation from economic growth" and concerned that the sheer volume of wastes is overwhelming national capacities to cope, the Basel Convention's member governments unanimous urged great efforts to minimise hazardous wastes at source.

4.5 Problems / barriers

In many countries, especially developing countries, there is still a lack of organisational structure (collection, handling, treatment, disposal), and inadequate legal and financial instruments, to properly manage their (hazardous) waste streams. The legal and financial environment is inadequate for operate it and more severe certainly no driving force for waste generators to think of preventing the generation of waste instead of (il) legally disposing it. The playing field is still dominated by experts and providers of end-of-pipe technology.

Furthermore the problem is still often approached from the 'end' – how to deal with waste – without innovative thinking if the quality (hazardousness) and quantity of the problem can be decreased upstream.

4.6 Can CP (further) contribute to the implementation process?

4.6.1 Best practices

It is in the basics of Cleaner Production to contribute to the reduction of hazardous waste. The 'founder father' philosophy of Cleaner Production was the Pollution Prevention approach launched by private companies like 3M in the USA to reduce its hazardous waste at the source, because of the growing costs and legal (and liability) rules to dispose hazardous waste. In the USA and Canada the term 'pollution prevention' is still used when talking about Cleaner Production. A similar argumentation / illustration can be given via the use in the past by the OECD (and also initially in India) of the terminology 'waste minimisation' when speaking about CP.

Numerous case-studies around the world are available for almost any sector that generates hazardous wastes for illustrating the 'win-win-approach' in cleaner production; reducing, amongst others, the volume and quantity of hazardous waste streams (the environmental objective of the Basel Convention) in a cost-effective manner (not only saving disposal costs but also saving upstream costs (often factor 10 higher) via avoiding high cost raw materials partly ending as waste stream. Illustrative examples are available amongst others for chemicals (numerous chemicals) textile industries (dyeing chemicals), tanneries (Cr-VI), electroplating (heavy metals, acids), foundries (hazardous waste containing sand streams), etc., etc. As part of the Basel Convention itself technical guidelines have been developed, either waste stream focussed or sector focussed. Furthermore the CP-network has developed sector-oriented guidelines, including options how to preventive avoid the generation of (hazardous) waste.

4.6.2 Best strategies

Based on analysis of the compilation of data and information in the annual questionnaires submitted under the Basel Convention on 'transmission of information' an overview can be given of the pallet of best strategies how to cope preventive with hazardous waste. In the questionnaire especially item 5 is covering "reduction and elimination of generation of waste". However when analysing the answers in the questionnaire the following generic remarks have to be made, illustrative for the implementation process of the Basel Convention:

- Only a limited number of countries fill in this specific question on "reduction and elimination of hazardous waste", compared to the answers on other issues – so still merely priority to control of transboundary movements and proper handling of hazardous waste.
- Answers given in the questionnaire are not complete; e.g. not mentioning that in a specific country a CP-centre is existing, activities have been launched, etc. This can be interpreted that:
 - The MEA-focal point in the respective countries have no knowledge of the existence of that CP-centre – lack of communication in the country between the MEA and the CP-centre;
 - The MEA-focal point misses the potential link between the CP-activities and the contribution to the reduction of hazardous waste – lack of awareness at the MEA

<p>Legislation</p> <ul style="list-style-type: none"> ○ Waste managements acts with preventive rules for hazardous waste ○ National waste plans with preventive actions for hazardous waste ○ Product ordinances ○ Eco management and Audit schemes including rules for the prevention of hazardous waste 	<p>Financial</p> <ul style="list-style-type: none"> ○ Eco tax on products with hazardous chemicals ○ Tax on the disposal at landfills used for preventive actions ○ Funds for the developments of environmentally friendly products ○ Licensed charges
<p>Technical</p> <ul style="list-style-type: none"> ○ Branch specific guides for the reduction of hazardous waste ○ Products specific activities for the reduction of hazardous waste ○ Eco design guides ○ Company prevention projects 	<p>Communication</p> <ul style="list-style-type: none"> ○ Extended producer responsibility with elements on hazardous waste (EPR) ○ Activities of municipalities on waste reduction including hazardous waste ○ Eco labels with hazardous waste elements ○ Regional waste programmes

1. Waste Management Acts with preventive rules for hazardous waste

- Sri Lanka: National Strategy for Solid Waste Management with cleaner production elements
- Ukraine: the National Strategy of wastes generation minimization
- Belarus: The waste law, including prevention of waste and reduce the harmfulness.
- Finland: waste Act introduce general obligation to prevent and to reduce the quantity and harmfulness
- Hungary: producer shall prepare a three-year waste plan for prevention of hazardous waste
- India: Draft act on Hazardous Waste Management
- European Union: Recent launched REACH Directive, with (in) direct implications also for industries working with chemicals

2. National Waste Plans with preventive actions for hazardous waste

- Vietnam: National Environmental Protection Strategy for complete Hazardous waste management including waste minimization and cleaner production
- Finland: the National Waste Plan 1998 include targets for the reduction of the amounts and harmful properties of waste
- Hungary: the National Environmental Program contains 19 measures for waste reduction including hazardous waste; Basel Convention Database
- Ireland: National Hazardous Waste Plan

3. Product ordinances

- Germany: Battery Ordinance 1998, Waste Oil Ordinance 1987

4. Eco management and Audit schemes including rules for the prevention of hazardous waste

- Finland: 50 registered EMAS sites; Basel Convention Database
- Sri Lanka ISO 14000 with cleaner production approaches

5. Eco tax on products with hazardous chemicals

- Thailand: tax differentiation for recycled batteries
- Belgium: eco tax on batteries and pesticides; MAMBO
- Canada: Ecology label for environmentally friendly products and services with criteria for 150 products: <http://www.environmentalchoice.com>
- Slovenia: Oil tax

6. Tax on the disposal at landfills used for preventive actions

- Latvia: natural resource tax for disposal of hazardous waste and subsidies for recovery of hazardous wastes.
- Slovenia: waste disposal tax,
- Slovakia: fees for land filling of wastes
- Finland: (Basel Convention Database)
- Sweden: tax on waste sent to landfill (2000)

7. Funds for the developments of environmentally friendly products

- Germany: Research on the Environment; <http://www.bmbf.de>
- Hungary: fund supports investments that lead to reduce hazardous waste

8. Licensed Charges

- Cambodia: PPP by licensed charges for some industries

9. Branch specific guides for the reduction of hazardous waste

- Thailand: CP projects in plastic, paper, electroplating, dyeing and tannery industries

10. Product specific activities for the reduction of hazardous waste

- Brazil: legislation about biomedical waste; resolution CONAMA
- Netherlands: Public Private agreement on the Take back and recycling of Electronic Scrap
- Taiwan: Private take back system for electronic products
- Canada: the Rechargeable Battery Recycling Corporation

- Japan: Electric Household Appliance Recycling Law

11. Eco design guides

- Germany: Manual on the consideration of environmental aspects in Development of new products

12. Company prevention projects

- USA: Shafer Electronics Company: elimination of lead pollution

13. Extended producer responsibility with elements on hazardous waste (EPR)

- Thailand: Greening Supply chain Projects
- Ecuador: responsible care program with cleaner production centers
- Czech: Chemical Responsible Care Programme (EU PHARE project)
- Canada: Corporations Sharing Responsible Programme
- Finland: Responsible Care by the chemical industry; Basel Convention Database

14. Activities of municipalities on waste reduction

- Thailand: local waste management plans for reduction
- Slovakia: promotion activities aimed at the elimination of hazardous wastes

15. Eco labels with hazardous waste elements

- Denmark, Norway, Sweden and Finland: Nordic Swan
- Austria Graz: ECOPROFIT label: 32 SME's

16. Regional waste programmes

- Africa: training and environmentally sound management programme for various hazardous wastes (BCRC and ACEEE)
- CEE: joint awareness raising and training workshops between BCRC and CP-centres

4.7 Conclusions

Based on the analysis of the implementation process of the Basel Convention, the results achieved so far, and the 'missed chances' to utilise the CP-concept in implementing the Basel Convention we can conclude the following:

- ❖ Main results achieved in minimizing the dangerous transboundary movements of hazardous waste (one of the objectives of the convention);
- ❖ With strong emphasis, also on national level, on proper control of handling, transport, storage and treatment / disposal / destruction of waste streams;
- ❖ This does not implicate that the handling of hazardous waste in developing countries is now appropriate; still numerous appalling examples with inadequate handling are existing resulting in severe environmental impact and health risks for workers and communities;
- ❖ But even more important, achievements to reduce the overall volume and toxicity of hazardous waste streams are rather limited;
- ❖ Legal structures and pricing mechanisms are often still inadequate for even properly finance and organise waste disposal and treatment, and certainly no incentive for waste generators for avoid the generation of waste;

- ❖ Resulting in continuous high costs for handling that growing amount of hazardous waste (e.g. partially 'a waste of efforts and money');
- ❖ As a spin-off of Basel Convention activities, and its focus on waste handling and not on prevention, rather limited efforts have been made to establish appropriate capacity and disseminate sufficient knowledge on preventive approaches; e.g. BCRC's role for a preventive approach is still limited, and not really linked with industrial service centres in the field of prevention (like CP-Centres);
- ❖ Cleaner Production has proven that 'pollution prevention' or 'waste minimisation' can be relatively easily realized, especially in outdated industries in developing countries, resulting in reduction of volume of toxicity of hazardous waste streams;
- ❖ Reduction of hazardous waste by industry has direct impact on their costs and legal implications with regard to intermediary storage, transportation and disposal, and even more important (because often a factor 10 higher) reduction of production cost earlier in the process.

Chapter 5 – Stockholm Convention on POPs

5.1 Main objectives and goals

The main objective of the Stockholm Convention is "to protect human health and the environment from persistent organic pollutants (POP's)".

POP's are carbon-based and, in these cases chlorine, containing compounds that:

- Remain intact in the environment for a long time (chemical stable);
- Become widely distributed throughout the environment;
- Accumulate in fatty tissue of living organisms; and
- Are toxic to humans and wildlife.

Persistent organic pollutants are the most long-lasting and pernicious contaminants; referred to collectively as the "Dirty Dozen". They are transported via air, wind and water currents to the global environment where they bio-accumulate in the fatty tissues of marine mammals such as seals, whales and walrus, but also many other food chains. POP's are even present in human mother milk. Some POP's are recognized as carcinogenic agents and endocrine disruptors.

The convention aims to reduce or eliminate releases of, at this moment, 12 POP's: eight pesticides (aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex, and toxaphene), two industrial chemicals (hexachlorobenzene (HCB) and polychlorinated biphenyls (PCBs)), and two POP by-products (dioxins and furans).

- The first 10 compounds, except DDT, are included in Annex A (elimination): the aim is to cease their production, use, and trade. The agreement prohibits production of PCBs immediately, and requires countries to remove from use all equipment containing PCBs, which should be phased out in the next quarter century or so.
- Annex B (restriction) deals with DDT: its use is accepted for the purpose of disease vector control, and as intermediate in the production of dicofol; countries that have requested to do so are allowed to continue using DDT against malaria, until effective and affordable alternatives are available.
- Annex C (unintentional production) addresses the release reduction of the unintentional production by anthropogenic sources of polychlorinated dibenzo-*p*-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), HCB, and PCBs.

Chemicals	Pesticides	Industrial chemicals	Unintended by-products
1. Aldrin	X		
2. Chlordane	X		
3. DDT	X		
4. Dieldrin	X		
5. Endrin	X		
6. Heptachlor	X		
7. Mirex	X		
8. Toxaphene	X		
9. Hexachlorobenzene	X	X	X
10. PCBs		X	X
11. Dioxins			X
12. Furans			X

During the treaty negotiations, hexachlorocyclohexane (HCH), chlordecone, hexabromobiphenyl, polycyclic aromatic hydrocarbons (PAHs), and other substances with characteristics similar to the mentioned dozen POPs included were also promoted for inclusion in the treaty by several European countries, but were finally excluded. Although some countries were initially reluctant to agree, the treaty was finally conceived as a dynamic legal instrument; for instance, it makes provision for new substances with POP characteristics to be included in the future. It also adopts a precautionary "approach" to include additional POPs in Annexes A, B, or C. At the COP-2, in May 2006 in Geneva, calls have been made for the following chemicals to be included in the treaty in the (near) future:

- Pentabromodiphenyl (proposed by Norway)
- Chlordecone (proposed by the EC)
- Hexabromodiphenyl (proposed by the EC)
- Lindane (proposed by Mexico)
- Perfluorooctane sulfonate (PFOS) (proposed by Sweden)

The Convention's mandate has a strong focus on the *preventive strategies*, set out by the direct references to Cleaner Production components in the preamble and objective. The preamble recognizes "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".

5.2 Preventive approach

The Stockholm Convention (and the Rotterdam Convention) both contain provisions relevant to Cleaner Production. The Stockholm Convention contains direct references to preventive approaches in its preamble and key control provisions. Cleaner Production is of importance for implementing the POPs treaty, particularly in regard to the Convention's goal of continuing minimisation and, where feasible, elimination of the unintentionally produced POPs, since this goal can be to a certain extent 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.

The Convention mandates *preventive* approaches, both in the objective and in the provisions on the implementation, including those on technological assistance and information exchange. Preventive approaches, such as use of safer alternatives, life cycle thinking are relevant both in regard to the intentionally and unintentionally produced POPs; 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.

Control provisions of the convention include separate articles for the intentionally and unintentionally produced substances, both pertaining to Cleaner Production. Especially 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 components and techniques.

Measures to reduce or eliminate releases from *intentional* production and use (Article 3). 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 preventive regulatory approach, which is one of the Cleaner Production components.

Measures to reduce or eliminate releases from unintentional production (Article 4). The article sets a goal to reduce total releases from anthropogenic sources to achieve "continuing minimization 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.

Particularly relevant to the preventive 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 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, and process changes.

5.3 Baseline activities and current approach

Implementation mechanisms

The Intergovernmental Negotiating Committee (INC) managed the Convention during the starting period; the official secretariat will be part of UNEP's office in Geneva.

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).

- 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 clearinghouse 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, asses 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.

Control provisions

Control provisions include separate articles for the intentionally and unintentionally produced substances, both pertaining 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 preventive 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
- 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, and process changes.

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 sub regional 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.

UNEP and the Global Environmental Facility (GEF) organized in 2002 sub-regional workshops to support the implementation of the Convention. The workshops were funded through a GEF Medium Sized Project with co-funding from the Government of Sweden. The workshops were primarily aimed at providing assistance to developing countries in strengthening their national chemicals management programs with regard to their implementation and ratification of the Stockholm Convention on POPs and related instruments. The primary target groups were senior government managers and decision-makers from environment and other government authorities. Representatives from international organizations, industry, academia and environmental NGOs also participated. Workshops were held in Ukraine, Zambia, Switzerland, Sweden, Caribbean, Slovak republic, Uruguay, Burkina Faso, Ghana, Bahrain, Thailand.

Furthermore, pursuant to paragraph 3 of article 12 of the Convention, regional or sub-regional centres have to be established, to provide capacity building and transfer of technology to assist developing countries to fulfil their obligations. It is envisioned to utilize the already existing BCRC's under the Basel Convention, in line with the aim to seek synergy between the 'chemicals convention' and efficiently use existing capacities.

Developed countries will have to provide funds and technical assistance to less developed nations, so that the latter can take effective measures. The European Commission seems committed to providing technical and financial assistance to developing countries and countries with economies in transition. Canada has pioneered a contribution of \$200,000 to China to reduce the use and dispersion of POPs. China and India are still producing DDT.

National Implementation Plans

Each party to the Stockholm Convention is required to develop a *National Implementation Plan (NIP)* describing how it will meet the obligations set by the

agreement. Governments must develop NIPs within two years from its entry into force. The NIP should supply a framework to implement, in a systematic and participatory way, priority policy and regulatory reform, capacity building, and investment programmes. Developing countries and countries with economies in transition are eligible for capacity building support for the implementation of the NIP. Financing for these plans is available through the Global Environment Facility. The GEF has established some guidelines for enabling activities for the Stockholm Convention, and has approved the project "Development of National Implementation Plans for the Management of POPs", the objective of which is to strengthen national capacity to manage POPs and to apply the Convention. At the moment more than 125 countries have already had their NIP proposal approved and have commenced work. On June 2006, 27 countries have submitted a national implementation plan.

5.4 Present implementation status

At present the Stockholm Convention has been signed by 151 countries and ratified by 126 countries. It is important to notice that several countries made an explicit declaration when ratifying with regard to "future amendments to Annex A, B or C" (so inclusion of new POPs under the convention framework), in accordance with article 245, paragraph 4, and declaring that this amendment will only enter into force for them "... only after it has deposited its instrument of ratification, acceptance, approval or accession with respect thereto". This has been done, amongst others, by Argentina, Australia, Canada, China, India, Slovakia, Slovenia and Venezuela.

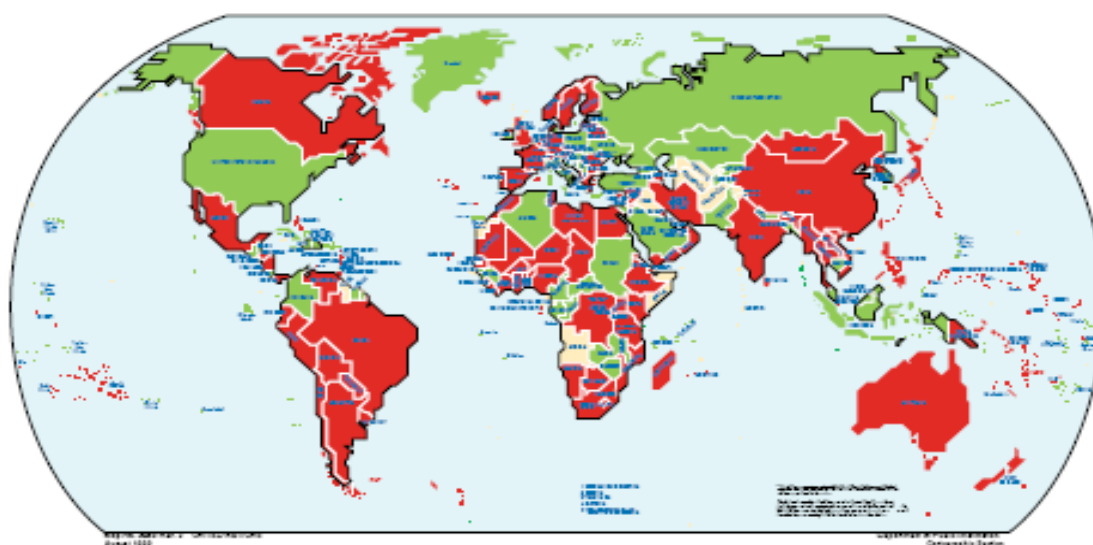


Figure 7 – Global ratification status of the Stockholm (POPs) Convention

Since September 2001, a total of 107 of the Signatory countries have identified their *National Focal Point (NFP)*. Most developing countries and countries with economies in transition also have selected an *Implementing Agency (IA)* to assist them in drafting a NIP project proposal and developing their NIP. To date (July 1, 2006) 27 countries have submitted their National Implementation Plans pursuant to Article 7(b) of the Stockholm Convention. In addition 34 NIP's should have been submitted according to the scheduled deadline, but not yet officially received.

Progress in NIP-development:

Phase 1: establishment of a coordinating mechanism and process organisation -> 27 countries

Phase 2: development of POPs inventories and assessment of national infrastructure and capacity -> 31 countries

Phase 3: priority assessment and objectives setting -> 23 countries

Phase 4: formulate the NIP and associated action plans -> 23 countries

Phase 5: NIP endorsement and submission -> 22 countries

[Status of Nov. 2005, according to GEF-report on February 3, 2006 to the COP-2

Regional coverage of the submitted NIP's:

- Europe: Czech Republic, Denmark, Finland, Germany, Latvia, Netherlands, Sweden, Switzerland
- NIS: Armenia, Republic of Moldova, Romania, Former Yugoslav Republic of Macedonia,
- Asia and Pacific: Fiji, Japan, Niue, Philippines
- West Asia: Lebanon
- Africa: Burundi, Chad, Ivory Coast, Morocco, Tanzania
- North America: Canada,
- Latin America and Caribbean: Bolivia, Chile, Nicaragua, Uruguay

Pesticides

A majority of the countries with available data already ban or stopped the import of most pesticides in the list on manufacturing, usage, import and export (www.pesticideinfo.org). Still the list of countries for which no data is available is large, especially the Eastern European countries (e.g. Ukraine, Poland, Romania, Lithuania, Macedonia, Croatia, Russia, Belarus). Exception is DDT, which is still used in some developing countries, as it is a cheap and easy way of controlling Malaria. The World Health Organization (WHO) estimates that 24 countries are still using DDT to control malaria. DDT is currently still being produced in some countries (e.g. Brazil, China, India, Indonesia and Russia).

Examples of countries still using one of more of the pesticides from the list of 12 are listed in the next box. Most of them do have severely restrictions for the import and usage of these pesticides.

	Dieldrin	Hepta-chlor	Toxa-phene	Aldrin	Mirex	Chlor-dane	HCB
Asia							
India	X						
Sri Lanka	X			X		X	
Philippines						X	
Thailand							X
China						X	
LAC							
Argentina		X					
Brazil	X	X	X	X		X	X
Colombia		X	X				
Venezuela	X			X			X
Belize			X		X		
Costa Rica		X					
Mexico						X	
Nicaragua		X					

PCB's

Because of their properties (resistant to high temperatures and pressure, virtually incombustible, easily soluble in oil and fat) PCB's were used in many different products, such as in closed applications like transformers, capacitors and in hydraulic systems. PCBs have also been used in open applications such as plastics, varnishes, paint, inks, drilling and cutting oils and carbonless copy paper.

Dioxins and furans

These chemical groups can be found everywhere in the environment because they are released in various incineration processes. They can evaporate from wood preserved with pentachlorophenol and can be formed as a by-product in certain industrial processes. Relatively high dioxin concentrations can be found in a number of products such as chloroprene rubber, HCl and trichloroethylene (tri). Waste incineration plants are originally by far the biggest sources of dioxins in general.

No intentional uses of dioxins are known.

With regard to the amount of POP's that is globally produced, used (pesticides and PCBs) an unintentionally emitted the available information is very scarce.

In many regions of the world information on POPs follows a downward gradient. Firstly, large data gaps exist on POP contamination of the environment that is, in soils and waters (even many areas of Europe lack systematic surveys). Secondly, gaps also exist on *food and feed* contamination (not all municipal and regional public health systems have comprehensive, continuous monitoring programmes in place, and the capacity to detect accidental contaminations is weak in some areas). Thirdly, very few countries regularly conduct representative surveys of concentrations of POPs in the general population.

Most, if not all, of the nine pesticides in question are still in use or existing in many countries. However, the actual quantity that specific countries may be currently using is unknown. There are no central registers of individual country use, although some organizations, like the FAO, United Nations Economic Commission for Europe, and the World Bank have begun to assemble aggregate use data.

The first initiative that is necessary to investigate these issues further is an in-depth inventory of the 12 compounds in individual countries, including a close examination of the amount used, the reasons for use, the alternatives available for the specific uses and the barriers that exist to the adaptation of alternatives specific to the country. Possibly a few case studies could be performed that would give a general idea of the answers to these questions. Once more quantitative data is available, and then more meaningful work can be done in evaluating different alternatives and aiding in the implementation of these alternatives.

5.5 Problems / barriers

There are many barriers to the adaptation of alternatives and to the adaptation of technologies with regard to POPs, especially in developing countries. Some of the alternatives are simply more costly both in price and in other resources required to apply them compared to the older more hazardous compounds. The use of older compounds, including some POPs, is common for a variety of reasons, including:

- Common social attitudes that foster the continued use of older products,

- Poor dissemination of both alternatives and information,
- Relatively high degree of illiteracy that constrains the dissemination of any information.

Some alternatives are believed to be more acutely toxic to the applicator than the POPs and therefore more hazardous to the individual, thus adding a human health cost dimension.

Other barriers to adoption include education and training. Education and training on both the older compounds as well as the possible alternatives is necessary for everyone in the production chain including the individual users and vendors. It may be that many individuals do not realize how hazardous the older chemicals are, what alternatives are available, and how to use these alternatives effectively.

The infrastructure and regulations that are needed to manage the use of pesticides, as well as educate and train individuals in the use of possible alternatives is not fully developed in all countries. Not all countries have the necessary infrastructure to implement effective management programs, nor do they have the infrastructure for the types of training that is described above.

Most important expressed needs with regard to POP's are:

(1) Needs with regard to Industrial Chemicals and Pesticides:

- Review of existing legislation and the introduction of new measures to restrict and eliminate POPs
- Education and training of personnel for monitoring and enforcement activities
- Inventories of existing stockpiles and identification of new sources
- Information exchange, awareness-raising programmes and the involvement of stakeholders
- Research for alternative means of vector control applicable in developing countries
- Financial support for the identification, managing and disposal of POPs
- Infrastructural assistance in developing functional laboratories and support for capacity building

(2) Needs with regard to unintentionally produced POPs

- Technical and Financial assistance in surveying and monitoring existing and potential problems.
- Developing and distributing guidelines for standard laboratory support procedures in the area of sampling and analysis.
- Initiating the development of a global information database on unintentionally produced POPs with the setting up of a directory of experts available for consulting.
- Organizing national, sub-regional and regional training seminars or workshops on more technical and specific issues of POPs to stakeholders, e.g., workshops for implementing the UNEP Toolkit on Dioxins and Furans.
- Sensitizing and mobilizing the public through awareness raising and dissemination of information through media, education and training.
- Provision of assistance to strengthen infrastructure and institutional arrangements within sub-regions.
- Introduction of Best Available Techniques and Best Environmental Practices with the encouragement of technology transfer between the developed and developing countries at affordable cost.

(3) Needs with regard to the financial mechanism

- Capacity building at all levels for development and coordination of National Implementation Plan activities.
- Improved communication between the GEF Operational Focal Point (OFP) and stakeholders.
- Organisation of more regional and sub-regional workshops to discuss progress and drawbacks in the development of National Implementation Plans thereby creating an opportunity for expert advice on specific areas.
- Financial assistance to support existing research centres and laboratories for sampling and analysis in meeting obligations under the Stockholm Convention.
- Support and assistance to countries with respect to communication and information exchange to strengthen public awareness on existing or planned projects through the media.
- Providing incentives for greater participation and involvement of the private sector in the NIP.

And a very crucial problem with dealing with unintentionally produced POPs (e.g. dioxins and furans) is that the monitoring is very difficult, and therefore any legal or financial instrument difficult to be applied. Resulting in a lack of driving forces to reduce / avoid those POP's. Compared to energy or waste that can be capitalised, with POP's it is less easy.

5.6 Can CP (further) contribute to the implementation process?

5.6.1 Best practices

When focussing on the industrial related POP's (e.g. the PCB's and the unintentionally produced dioxins and furans) part of the solution can be found via Cleaner Production. As can be seen in the table below, sources of those POP's are a variety of sectors, and not only, sometimes thought, the thermal waste combustion processes.

With regard to out phasing the use of PCB's, used amongst others in transformers and as heat exchange fluids, already suitable substitution materials are available. With regard to avoiding the unintentionally produced dioxins and furans the options can be end-of-pipe related (e.g. additional flue gas treatment equipment) but very costly and therefore Cleaner Production again is the solution to find solutions upstream in the process via chemical substitution measures (avoid especially chlorine consisting materials in the process when not needed), technology alternatives and environmental management (other process parameters, better control of process conditions, etc.)

Stockholm Convention already has prepared an on-line reference database for potential alternatives and also in the EU-IPPC BAT Reference documents for specific sectors reference is made how to avoid POP's.

Sectors and industries relevant regarding these POP's:

	DDT and Drin's	PCB's	Dioxins & Furans
Agriculture	X		
Health care	X		
Water and wastewater disinfection			X
Waste incineration		X	X
Pulp and paper			X
Chlorinated chemical production		X	X

Pesticides chemical production	X	X	X
Carbon chemical production		X	X
Oil refining			X
Coal and oil combustion		X	X
Uncontrolled combustion (fires)		X	X
Textile and leather			X
Metallurgical recycling		X	X

Planned activity for Clearinghouse mechanism for information exchange, in accordance with paragraph 4 of article 9, to be finalized in 2007.

5.6.2 Best strategies

Based on the analysis of already submitted NIP's, some of them (especially in the developed countries) describing already implemented strategies) and the initiated multi- and bilateral activities the following pallet of strategies can be drafted.

<p>Legislation</p> <ul style="list-style-type: none"> o National implementation plans (NIP's) o National Inter-Departmental Councils (Armenia) o Cleaner Production laws (China, Philippines) o POP's control acts (many countries) o Pest Control Acts (Canada) o Regional cooperation resolution on sound chemical management (North America) o Global Action Plan for the Reduction of Reliance on DDT (WHO) o Zero dioxin policies (USA) o State wide strategy to reduce dioxin emissions (USA) 	<p>Financial</p> <ul style="list-style-type: none"> o GEF funds for NIP's and implementation projects o National funds for implementation projects (Canada POPs Fund)
<p>Technical</p> <ul style="list-style-type: none"> o Integrated pest management systems (IPM) (Honduras, Trinidad & Tobago) o Establishment of Cleaner Production Centre (Armenia) o Lists of alternatives for POP's o Application of BAT/BEP principles o Regional Workshop on BAT/BEP o Establishment of POPs Central Analytical Laboratories on national level o Optimizing monitoring programs o Application of CP technologies and active involvement of NCPC (Philippines, Switzerland) o Regional pilot projects on ESM of PCB's in Central America and Africa 	<p>Communication</p> <ul style="list-style-type: none"> o Registers for country specific usage of pesticides (FAO, World bank and UNECE) o Obsolete Pesticide data from 82 countries (FAO) o Chemicals Information Exchange Network (CIEN) o Multi Stakeholder involvement and active industry participation (Japan, Switzerland, Canada) o PR campaign based on CP philosophy (Philippines) o Updated information from 111 countries on regulatory status of POPs on bans, restrictions, legally permitted use or no actions

<ul style="list-style-type: none"> ○ Replacement programs of PCB-containing oils and their disposal/destruction ○ Dioxin Toolkit (Asia-Pacific) 	<ul style="list-style-type: none"> ○ Regional workshops on implementation ○ Promotion of non-combustion technologies ○ Community campaigns on zero dioxin solutions (USA)
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General

Global:

- The UNEP organises regional workshops implementing the Stockholm convention. Workshops were held in Ukraine, Zambia, Switzerland, Sweden, Caribbean, Slovak republic, Uruguay, Burkina Faso, Ghana, Bahrain, Thailand. The workshops encourage countries to initiate development of national strategies and action plans for reducing/ eliminating releases of POPs, to assist national officials, including POPs national focal points to UNEP, in implementing immediate national and/or regional actions determined to protect against the risks of POPs and to prepare countries for technical implementation of a future global convention on POPs.
- Specified regional and sub-regional workshops were held on alternatives approaches (Chemical and Non-Chemical) to POPs pesticides. To raise awareness among national officials of sustainable approaches in the reduction/ elimination of POPs pesticides and promote collaboration between agriculture, environment and health sectors in efforts to implement integrated pest and vector management.
- Also sub-regional workshops on identification management of PCBs, dioxins and furans were conducted. To train country experts to identify PCB-containing equipment, make inventories and manage PCBs; identify sources of dioxins and furans and quantify their releases.

Global: Updated information from 111 countries on regulatory status of POPs on bans, restrictions, legally permitted use or no actions.

Global: Chemicals Information Exchange Network (CIEN) aims to:

Eliminate barriers to the exchange of information.

Facilitate access and sharing of technical information about chemicals on the Internet.

Create greater involvement and communication among the national and regional agencies responsible for the management of chemicals.

Strengthen national capacity for participation in activities and international agreements involving sound management of chemicals.

Protect human health and the environment and improve the sound management of chemicals in the participating countries.

Central America: UNEP, BCRC and SBC are conducting regional pilot projects on ESM of PCB's in Central America and Africa. The demonstration projects focus on decontamination and replacement of PCB containing equipment.

North America: The Sound Management of Chemicals (SMOC) initiative under the North American Agreement on Environmental Cooperation (NAAEC) commits the Governments of Canada, Mexico and the United States to cooperate on improving the sound management of chemicals in North America. The Resolution gives priority to the

management and control of substances of mutual concern that are persistent, bio-accumulative and toxic, but also allows for cooperation on a broader scale for the sound management of chemicals in the three countries.

Canada: The Accelerated Reduction and Elimination of Toxics (ARET) program was a major voluntary effort to secure a safe and healthy environment while contributing to a prosperous economy. ARET sought, through voluntary actions, the virtual elimination of 30 persistent, bio-accumulative and toxic (PBT) substances, as well as significant reductions in emissions of another 87 toxic substances. Participants from eight major industrial sectors and government used the ARET program to prioritize emission reductions and determine appropriate reduction and elimination methods.

The ARET Program ran from 1995 to 2000, with the goals of achieving a 90% reduction of PBT substance emissions and a 50% emission reduction of 85 toxic substances by the year 2000, measured against declared base-year levels. The final result was that PBT substances were reduced by 61%, while all others were reduced by 72%.

Environment Canada was the key supporter of ARET, although the program was designed, implemented and overseen by an external multi-stakeholder committee. Environment Canada provided the ARET Secretariat. The ARET Stakeholders Committee is made of representatives from industry (Canadian Chemical Producers' Association, Canadian Electricity Association, The Alliance of Manufacturers and Exporters of Canada, Canadian Manufacturers of Chemical Specialties, Canadian Petroleum Products Institute, Canadian Pulp & Paper Association, Canadian Steel Producers Association, Mining Association of Canada, Aluminium Industry Association), health and professional associations (Chemical Institute of Canada, Comité de santé environnementale du Québec), provincial governments, and the federal government (Environment Canada, Industry Canada, Health Canada).

A new program, called ARET 2 has a substantially expanded target substance list, which includes the following POPs: mirex, hexachlorobenzene, PCBs, and 17 dioxins and furans.

Canada: The objective for the Canada POPs Fund is to significantly reduce and/or eliminate foreign sources of POPs that are impacting health and environment worldwide, and particularly in the Canadian Arctic. The POPs Fund is being used to assist developing countries and countries with economies in transition to build their own capacities to address POPs issues. The Fund is administered by the World Bank and is available for a variety of projects, tailored to the needs of specific countries, such as: developing POPs inventories; establishing the regulatory mechanisms and building the institutional framework needed to control POPs releases; and finding alternatives chemicals or strategies to the use of POPs.

NIP's

- Global: UNEP is enabling developing National Implementation Plans for the Stockholm Convention on Persistent Organic Pollutants (POPs). UNEP is assisting developing countries and countries with economy in transition, eligible for GEF funding, developing NIP's. The overall objective of the projects is to create sustainable capacity within the countries to meet their obligations under the Stockholm Convention. The primary outputs will be the National Implementation Plans. As such they will serve broader purposes of chemical safety and management.

- Armenia: In the NIP of Armenia, the establishment of a *CP centre* is part of the strategy. In order to decrease the impact of POPs on human and environmental health, the overall strategy on reduction/limitation of POPs releases should correspond to the strategy of cleaner production, which presupposes application of integrated strategy on environmental protection in industrial processes, in finished/ manufactured products, in the sphere of rendering services. Main elements of this strategy are as follows:
 - Efficient use of raw materials and energy resources;
 - Reduction/ elimination on application of toxic and hazardous materials, including organo-chlorinated ones;
 - Minimizing wastes generation, including POPs-containing wastes;
 - Utilization and recycling of wastes in ecologically sound manner;
 - Improvement and changes of technology.
 - The strategy of Armenia is especially focused on replacement programs and application of BAT/BEP principles as background for development of the strategy for future industrial progress. They also focus on the establishment of a POPs Central Analytical Laboratory; a National Inter-Departmental Council on implementation of Stockholm
 - Convention and carrying-out policy on POPs issues, raising the level of coordination in activity of different Ministries/Agencies involved in POPs-related issues, as well as for efficient information exchange.
- Philippines: The Ecological Solid Waste Management Act of the Industries under the Act are encouraged to adopt pollution prevention/cleaner production measures, which should also assist to reduce or eliminate releases of unintentional POPs. The Philippines CP centre offers Cleaner Production Trainings and Seminars; Cleaner Production Facility Assessment; Technology Database, Technology Evaluation, Technology Verification; Other activities conducted by Integrated Program on Cleaner Production Technologies -Department of Science and Technology. In addition the NIP has a professional communication strategy based on CP concepts.
- Japan: The NIP of Japan has a strong emphasis on stakeholder involvement. Efforts to ensure the implementation of the national implementation plan shall be pursued through a coherent implementation framework put in place by the central government as well as coordination and cooperation among all the actors concerned of civil society. With a view to ensuring the participation of and cooperation with various actors, the Government will also promote and facilitate the provision to the various actors of information on the contents of the Stockholm Convention, the purpose of the national implementation plan as well as measures, which can be taken by each actor concerned.
- Switzerland: Focus on multi-stakeholder involvement with e.g. professional associations such as the Association of Technical Inspectors and others dealing with Cleaner Production. Other envisioned stakeholders are: the Federal Office for the Environment, and the Swiss Federal Roads Authority, the engineering and environmental science faculties of the Swiss Federal Institutes of Technology, the Swiss Federal Laboratories for Materials Testing and Research, the environmental protection agencies of the Cantons, the relevant industrial associations such as the Swiss Society of Chemical Industries (SSCI) or the Metal and Engines Manufacturers, or even the association combining the Swiss industries (Economiesuisse).
- Macedonia: Focus on integration, sustainable development, polluter pays, precaution, cleaner production, international cooperation, participation and access to information, raising public awareness on the importance of the environment.

PCB

- Ukraine: Developing a PCBs Inventory. Through analysis of the available documentation and expert on-site investigations/field visits, to develop an inventory of PCBs containing equipment and other PCBs sources. Review of technical and economic requirements for the environmentally sound technologies of PCBs treatment/destruction should be compiled.
- Ivory coast: National Program for the environmentally sound management of PCB's focused on: 1. Completion of a national inventory. 2. Drafting national regulation. 3. Development of a national plan for the management of PCB's.
- Cuba: Phasing out PCBs by quantifying the inventory of PCBs and PCB-containing equipment with a longer-term goal of destruction/elimination, funded by USA and UNEP.
- Bahamas: Regional pilot to inventory PCB-containing equipment and develop a management strategy for their sound management, funded by the USA.
- Estonia: Owners of equipment containing PCBs must remove them from use or clear from pollution and eliminate PCBs from equipment as soon as possible but not later than December 31, 2010.

Dioxins and furans

- Global: Training of national experts to identify and quantify sources of PCDD/PCDF and establish national release inventories for Brunei Darussalam, Jordan, Lebanon, Philippines, Vietnam, Argentina, Cuba, Paraguay. Including the establishment of a network of regional experts. Funded by US EPA, Canada POPs Fund and UNEP Chemicals.
- Russia: Reduction of Dioxins and Furans Releases in the Russian Federation. The primary objective is the reduction of dioxins/furans releases to the Arctic from key industrial sectors with particular focus on the pulp and paper industry and landfill incinerators. The project is conducted together with and co-financed by the USA.
- USA: In 1997, the Zero Dioxin Alliance united people who live and work near dioxin sources in Bay Area and California communities, environmental justice groups, people with cancer, women with endometriosis, health care workers, people who fish for food and others in an effort to stop dioxin exposure. Since then the new people power movement has made history in the Bay Area. The new Alliance supported independent science to expose state agencies' cover-up of angler dioxin threats that EPA now ranks among the highest priority problems in San Francisco Bay. Alliance members proposed, and with the support of progressive labour leaders, won the first zero dioxin policies adopted by a U.S. City, County, and region in 1999. Community campaigns won zero dioxin solutions in controversies regarding the Chevron Chemical plant in Richmond and a vinyl chloride clean-up site in West Oakland, defeated a plan that would increase dioxin at the Kaiser Cement plant in Cupertino, and won an agreement of the community, workers and plant owners to zero out dioxin without job loss at a small business in Bay view/Hunters Point.
- USA: In 2001, the New Hampshire Department of Environmental Services targeted "dioxin as a significant public health threat requiring immediate attention," and established a statewide strategy to reduce dioxin emissions by 50% over the next two years. The strategy includes setting up a comprehensive inventory of dioxin emissions and their sources, and over 50 recommendations to

- reduce emissions from over 20 sources, such as closing medical waste incinerators.
- USA: In 2001, Maine passed a law to reduce dioxin releases by banning open burning of municipal solid waste in burn barrels. It also established a state policy to reduce dioxin and mercury and spurred a state study on diverting PVC waste away from incineration.
 - New Zealand: Auckland International Airport Limited (AIAL) is required to treat quarantine waste under the Bio-security Act. Dioxin formation can be avoided and regulatory requirements for the treatment of quarantine waste can be met by cleaner treatment technologies such as steam sterilisation. Two non-incineration treatment facilities for quarantine and medical waste have recently been established in Wellington and Auckland. The implications for shareholders on the direction AIAL management take are substantial. There is little material difference between the cost of upgrading the incinerator and installing steam sterilisation units. When one takes into account the likely future regulatory restrictions that will be placed on dioxin and other toxin producing technologies, the only clear choice for management is to select a steam sterilisation unit. Doing otherwise will be a bad financial and environmental decision.
 - Netherlands: Passed a resolution to prevent dioxin pollution by phasing out the use of PVC plastic (wrappings, tubes etc.) and encouraging manufacturers to use safer materials.
 - The Canada-Wide Standards for Dioxins and Furans (CWS) are national standards developed under the Canadian Council of Ministers of the Environment (CCME) Canada-wide Environmental Standards Sub-Agreement. CWSs flow from a political commitment by federal, provincial and territorial Ministers to address key environmental protection and health risk issues that require concerted action across Canada. The standards are developed jointly by all jurisdictions that signed onto the Harmonization accord with the coordination of CCME. The Canada-wide Standards process for dioxins and furans has focused on anthropogenic sources that are releasing dioxins and furans to the atmosphere.
 - Canada: In 2001, the Federal/Provincial Task Force on Dioxins and Furans released the first Dioxins and Furans and Hexachlorobenzene Inventory. Six priority sectors, varying from regional to national in scope, accounting for about 80% of national emissions in have been identified as priorities for early action. These are waste incineration (municipal solid waste, hazardous waste, sewage sludge and medical waste); burning salt laden wood in coastal pulp and paper boilers in British Columbia; residential wood combustion; iron sintering; electric arc furnace steel manufacturing; and conical municipal waste combustion in Newfoundland. For more information: www.ccme.ca.

5.7 Conclusions

Many of the POP's are still in use in at least some countries. The paucity of reliable data regarding use and disposal has meant that it has not been possible to accurately determine the quantities still in use, where they are used, the specific crops to which the pesticidal substances are being applied, and the direction and initiatives underway to eliminate these substances throughout the world. Where data does exist, it is plagued with a variety of limitations making it difficult to develop comprehensive and accurate use profiles.

While convincing substantive evidence exists for the actual and potential toxic impact of these substances to both human health and the environment, a comprehensive, accurate and reliable inventory of global manufacture, use and disposition, must be developed to allow the effective and efficient elimination of these substances throughout the world.

Several risk reduction strategies are available for the POPs. They involve greater use of alternatives to substances still in use and proper disposal of POPs in storage or in closed systems (e.g. PCBs). As this is a global problem, these strategies need to be coordinated on a global level and must be tailored to the socio-economic considerations of user nations.

Based on the analysis of the implementation process of the Stockholm Convention, the results achieved so far, and the 'missed chances' to utilise the CP-concept in implementing the Stockholm Convention we can conclude the following:

- ❖ Stockholm Convention only entered into force 'recently';
- ❖ Logically most activities are oriented so far on preparation of inventories and National Implementation Plans;
- ❖ Adequate support for preparation of these NIP's is available (e.g. GEF-support);
- ❖ At the same time the most efforts are geared to the bulk of the POPs (e.g. the pesticides), via controlling / reducing the use, and properly handling the (outdated) stockpiles, often stored under dangerous conditions;
- ❖ Only limited attention is given yet to the 'industrial' POPs, e.g. the PCB's and the unintentionally produced dioxins and furans. These type of POPs will need more attention, also in the context of expected enlargement of the coverage of the convention (e.g. inclusion of other industrial POPs);
- ❖ In most (developing) countries no knowledge is available to measure or even estimate those industrial POP's, especially the unintentionally produced; not only due to non-existence of knowledge centres but also due to lack of awareness and as a result of that lack of priority;
- ❖ At the moment no to limit legal or financial incentives are in place to stimulate the avoidance of unintentionally produced POPs, e.g. no fines or restrictions for POPs emissions, partially due to the fact of the lack of appropriate monitoring of the amount of emissions;
- ❖ But at the same time avoidance of unintentionally produced POPs can best be achieved via process-integrated preventive measures, thereby avoiding high add-on costs for End-of-Pipe control measures;
- ❖ Overviews of BAT's for the respective industrial sources that can cause (un) intentionally produced POPs show that POPs can be (partially) reduced via appropriate process-integrated measures;
- ❖ Cleaner Production has shown to be an adequate approach for analyzing and implementing process-integrated measures.

Chapter 6 - Cleaner Production

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

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

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

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

What has been accomplished?

In the last ten years, Cleaner Production has attempted a paradigm shift in environmental management at the level of governments, business and financing institutions, as well as local governments and communities. However, there have been a number of barriers in the promotion and adoption of Cleaner Production, encompassing various issues such as problems in communication, resistance to change, lack of appropriate demonstrations of Cleaner Production to prove its benefits, inadequate training, and a lack of Cleaner Production-related information and problems in accessing cleaner technologies. Other critical barriers include the lack of financing and, more significantly, a lack of Cleaner Production orientation in the national policy and regulatory framework. Typically, the progression of Cleaner Production mainstreaming in a country has followed a strategy of moving from awareness creation to capacity building of institutions, and to implementation throughout manufacturing and service organisations. As a next logical step, with the help of the key institutions, and by working in partnership, Cleaner Production is implemented within all other sectors to increase its acceptance. For a multiplier effect, information-sharing mechanisms are then instituted by holding seminars, publishing manuals, conducting training and operating websites. To develop an enabling framework, suitable financing mechanisms and policy instruments are

devised. Based on in-organisation experiences and consultations with important stakeholders, reforms are then undertaken to mainstream Cleaner Production in the national policy and regulatory framework. Some of the major highlights of the above achievements are summarised below.

Raising Awareness

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

Obtaining Commitment

Obtaining a commitment is an essential step to ensure moving from awareness to action. The International Declaration on Cleaner Production (IDCP) has been an excellent step to obtain commitment of a large number of stakeholders at various levels including national governments. The IDCP is a voluntary but public commitment to the strategy and practice of Cleaner Production. This Declaration was launched at the 5th International High- Level Seminar on Cleaner Production, held at Phoenix Park, South Korea in 1998. As of September 2002, the IDCP has over 350 signatories and has been translated into 15 languages.

Building National Capacities

Recognising a need to set up model institutions on Cleaner Production at the national level, UNIDO and UNEP launched a National Cleaner Production Centres (NCPC) Programme. There are now 22 NCPCs set up with the assistance of various donor agencies. Many international donors, notably the Swiss Government, the International Labour Organisation, NORAD, USAID, the World Bank, and the Global Environment Facility (GEF) have identified NCPCs as highly competent partners for delivering their programmes and projects on the national level. Taking the lead from NCPC Programme, several Cleaner Production Centres (CPCs) have been set up by many countries by allocating national funds and in some cases drawing assistance of donor agencies. There is currently a global Cleaner Production network of more than 100 CPCs operating in about 40 countries. Today this network is a global alliance demonstrating a partnership among international agencies, national governments, financing and developmental institutions, business associations, environmental NGOs and academia.

Demonstrating Cleaner Production

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

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

Information Networking

Cleaner Production has been one of the major themes of discussion at the regional and international arena. UNEP DTIE through its High-level Seminars on Cleaner Production gave a momentum to international efforts focusing on Cleaner Production. Across all the regions, several roundtables are now operated on Cleaner Production. Prominent amongst these include the National Pollution Prevention Roundtable (NPPR) in the US and the European Roundtable on Cleaner Production (ERCP). The NPPR operated a number of P2 roundtables in the US and also in Mexico. The Asia-Pacific region has organised three Cleaner Production roundtables. Apart from holding Cleaner Production Roundtables, the Mercosur region has proposed the formation of a Cleaner Production network. The African region has initiated the regional consultation process by organising Roundtables on Sustainable Consumption and Cleaner Production 2000 and 2002. Most of these roundtables are now operating websites. The experiences of Cleaner Production networking, worldwide, catalysed several other agencies and programme to set up their own Cleaner Production networks. Many of the themes for networking shared a common vision to Cleaner Production. Examples include the Greening of Industrial Networks, International Green Productivity Association (IGPA), O2 International Network of Sustainable Design, CDG's Latin American Network, Canadian C2P2 network, O2 international network of sustainable design, PREPARE for Europe etc. UNEP DTIE developed the International Cleaner Production Information Clearinghouse (ICPIC) that has information on technical and policy sources of information. Other important web-based initiatives on Cleaner Production include the International Cleaner Production Co-operative launched by US Environmental Protection Agency, and the websites of Environment Australia, the Chinese NCP and the Canadian Centre for Pollution Prevention.

Technology development and Co-operation

An upcoming impetus to the cleaner technology market is now evident due to some of the multilateral environmental agreements such as the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes (The Basel Convention); the Stockholm Convention on Persistent Organic Pollutants (the POPS Convention); and the UN Framework Convention on Climate Change. Several sectoral institutions have established initiatives to promote adoption of cleaner technologies in their own sectors by setting up business-to-business web sites, sponsoring technology development projects and by organising thematic trade fairs. Increased foreign direct investments in developing countries have led to some cleaner technology adaptations. Eco-labels, in particular, have been one of the prime push factors in sectors such as textiles, leather

tanning, metal finishing, food and pulp and paper. This has fostered substitution and elimination of hazardous chemicals and processes leading to Cleaner Production interventions along the supply-chains. There have also been efforts on promotion of cleaner technologies on regional bases. Examples are the Asia Pacific Centre for Technology Transfer (APCTT) in New Delhi, the Centre for Environmentally Sound Technology Transfer (CESTT) in China, the International Centre for Environmental Technology Transfer in Japan and the Ecolinks initiative operated by USAID for Central Eastern European countries.

Development of CP-oriented Policies and Strategies

A number of countries have made progress, albeit to varying extent, in applying a mix of instruments for promoting Cleaner Production. Markets have started influencing both production and consumption by building awareness through eco-labels, establishing environmental and social codes for products throughout the supply-chain and by developing and implementing environmental management systems. This has provided an overarching framework for a more integrated approach to Cleaner Production, encompassing process, product, services and consumption. More recently, countries mainly in the North Atlantic (notably the US), the European Union (EU) region (notably Denmark, Netherlands, and Spain), Norway and Australia have placed an emphasis on reforming the legislative framework, stressing the promotion and recognition of voluntary instruments – especially Cleaner Production. The European Union has already established the Industrial Pollution Prevention and Control (IPPC) Directive and many of its member states are in the process of aligning their national Cleaner Production-related policies and strategies with the IPPC.

One of the steps taken in the EU to increase the focus of Cleaner Production on products and related markets, was the development of an Integrated Product Policy (IPP) Some EU Member States have already developed, or are developing Environmental Product Policy (EPP) frameworks.

Chile and Columbia provide good illustrations of Cleaner Production-related policies in the Latin and Caribbean region. The Asian Development Bank is supporting several Regional Environmental Technical Assistance Programmes for the Promotion of Cleaner Production Policies and Practices in Selected Developing Member Countries. Cleaner Production strategies are not limited within the national networks. The Asia-Pacific Economic Co-operation (APEC) formally adopted a Cleaner Production strategy in 1997.

What should be done?

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

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

The all-pervasive nature of Cleaner Production has enabled a wider dissemination of its core message across the world, albeit in multiple forms, depending on local interpretation. But in doing so, Cleaner Production promoters did not establish a formal Cleaner Production system, or a common standard approach. Given the establishment of several other overlapping and competing programmes, systems and strategies today, the discrete potentials of Cleaner Production still remain unclear. Cleaner Production promoters must establish, document and communicate the Cleaner Production implementation principles and processes that can be commonly understood and applied across all sectors and by all stakeholders. It is critical to strengthen the global standing of Cleaner Production, by driving it through overarching policies and agreements that are endorsed internationally. The IDCP has been an excellent step towards obtaining the commitment of a large number of stakeholders at various levels including national governments on Cleaner Production. The implementation guidelines brought out by UNEP are the first step towards drawing up a plan to actively facilitate the implementation of the IDCP.

In such efforts, it may be strategic to establish a synergy between Cleaner Production and implementation of various Multi-lateral Environmental Agreements (MEAs) at the national level. The key needs are therefore, to move towards more synergy and mobilization between national and regional implementing and co-ordinating agencies for MEAs and the Cleaner Production network worldwide. The establishment and operation of CPCs/NCPCs has been one of the major steps for facilitating dissemination and implementation of Cleaner Production in the last decade, and demonstrates a true capacity building and partnership approach. It is important to expand the vision and agenda of the CPCs/NCPCs and to equip them with skills to run the Centres like Strategic Business Units and for them to establish models and approaches for future CPCs/NCPCs to follow. To achieve this objective, the CPCs/NCPCs must be adequately positioned to mainstream Cleaner Production in national policies and regulatory framework. In addition, it is necessary that CPCs/NCPCs operate in close partnerships with the financing institutions; technology development agencies and consumer based environmental NGOs. CPCs/NCPCs should focus now on the expanded vision of Cleaner Production that links explicitly with Sustainable Consumption. CPCs/NCPCs should also start playing a proactive role in assisting local and national governments, businesses and communities to implement the various MEAs.

Chapter 7 – Synergy between then MEAs and CP

Sustainable Development as a Shared Goal

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. 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).

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 preventive 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. Cleaner Production, as a strategy for the practical application of the precautionary approach, is of key importance for the implementation of international agreements. The preventive 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.

Issue Linkage and Positive Incentives for Compliance

Integration of Cleaner Production into international environmental agreements could assist countries that 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 preventive policies in industrialised countries, investments in pollution control in industrialised countries were more than 5% of total industrial investment. 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.

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, 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.

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 hydro fluorocarbons (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.

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 preventive 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.

Chapter 8 – Conclusions and recommendations

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.

MEA - specific

UNFCCC:

- ❖ Growing consensus on relevance and importance to tackle and mitigate climate change;
- ❖ All stakeholders underline the importance of energy efficiency;
- ❖ There is a growing local capacity in developing countries to comply with the required 'simple' MEA-obligations (see the trend of availability of national communications);
- ❖ The utilisation of the Kyoto-protocol mechanisms (JI, CDM) offer opportunity to co-finance investments;
- ❖ Due to delay in the political process with regard to Kyoto is the actual implementation of CDM and JI-projects in most regions still in an early stage;
- ❖ At country level still insufficient knowledge is available, especially related to direct services for enterprises, how to prepare eligible CDM / JI – proposals on energy efficiency in industrial processes;
- ❖ At the same time a decoupling trend between economic growth and energy consumption is not really been seen in developing countries, and also in the developed countries the targeted GHG-reduction is not achieved yet, nor expected soon;
- ❖ Cleaner Production, when applied correctly has proven that energy efficiency is a successful concept for industry;
- ❖ GHG-reduction via energy efficiency can be a win-win, savings due to less energy consumption (economic, decreased costs) and CO₂-reduction (environment);
- ❖ However most energy consultants focus merely on the energy consuming activities and overlook the potential energy savings via process integrated measures, and on the other hand cleaner production consultants are merely material balance focused with limited attention to energy balance analyses and tend to forget to calculate potential CO₂-reduction;
- ❖ Attention is given to readjust this unbalanced / sub-optimal analysis of industrial processes via so-called CP-EE-projects (e.g. pilot projects in UNEP/GEF and GERIAP);
- ❖ Cleaner Production can contribute significantly, when applied properly, to reduce GHG-emissions and thereby contribute to the implementation of the MEA;
- ❖ And at the same time CP could utilise the existence, awareness and priority for the MEA at national policy level as leverage.

Basel Convention:

- ❖ Main results achieved in minimizing the dangerous transboundary movements of hazardous waste (one of the objectives of the convention);
- ❖ With strong emphasis, also on national level, on proper control of handling, transport, storage and treatment / disposal / destruction of waste streams;
- ❖ This does not implicate that the handling of hazardous waste in developing countries is now appropriate; still numerous appalling examples with inadequate handling are existing resulting in severe environmental impact and health risks for workers and communities;
- ❖ But even more important, achievements to reduce the overall volume and toxicity of hazardous waste streams are rather limited;
- ❖ Resulting in continuous high costs for handling that growing amount of hazardous waste (e.g. partially 'a waste of efforts and money');
- ❖ As a spin-off of Basel Convention activities, and its focus on waste handling and not on prevention, rather limited efforts have been made to establish appropriate capacity and disseminate sufficient knowledge on preventive approaches; e.g. BCRC's role for a preventive approach is still limited, and not really linked with industrial service centres in the field of prevention (like CP-Centres);
- ❖ Cleaner Production has proven that 'pollution prevention' or 'waste minimisation' can be relatively easily realized, especially in outdated industries in developing countries, resulting in reduction of volume of toxicity of hazardous waste streams;
- ❖ Reduction of hazardous waste by industry has direct impact on their costs and legal implications with regard to intermediary storage, transportation and disposal, and even more important (because often a factor 10 higher) reduction of production cost earlier in the process.

Stockholm Convention:

- ❖ Stockholm Convention only entered into force 'recently';
- ❖ Logically most activities are oriented so far on preparation of inventories and National Implementation Plans;
- ❖ Adequate support for preparation of these NIP's is available (e.g. GEF-support);
- ❖ At the same time the most efforts are geared to the bulk of the POPs (e.g. the pesticides), via controlling / reducing the use, and properly handling the (outdated) stockpiles, often stored under dangerous conditions;
- ❖ Only limited attention is given yet to the 'industrial' POPs, e.g. the PCB's and the unintentionally produced dioxins and furans. These type of POPs will need more attention, also in the context of expected enlargement of the coverage of the convention (e.g. inclusion of other industrial POPs);
- ❖ In most (developing) countries no knowledge is available to measure or even estimate those industrial POP's, especially the unintentionally produced; not only due to non-existence of knowledge centres but also due to lack of awareness and as a result of that lack of priority;
- ❖ At the moment no to limit legal or financial incentives are in place to stimulate the avoidance of unintentionally produced POPs, e.g. no fines or restrictions for POPs emissions, partially due to the fact of the lack of appropriate monitoring of the amount of emissions;
- ❖ But at the same time avoidance of unintentionally produced POPs can best be achieved via process-integrated preventive measures, thereby avoiding high add-on costs for End-of-Pipe control measures;

- ❖ Overviews of BAT's for the respective industrial sources that can cause (un) intentionally produced POPs show that POPs can be (partially) reduced via appropriate process-integrated measures;
- ❖ Cleaner Production has shown to be an adequate approach for analyzing and implementing process-integrated measures.

Generic conclusions:

MEAs and CP can be seen as two directions how to tackle environmental problems; MEA more from a top-down and (initially) command-and-control approach and CP more from a bottom-up and voluntary approach, and linkage of both strategies should strive for optimal synergy to utilise its strengths and overcome its weaknesses.

- ❖ MEAs in general appear to be a strong basis for (inter) national environmental strategies, because the extensive (high level) support;
- ❖ UNFCCC, Basel Convention and Stockholm Convention all cover subjects that are relevant for industry; respectively energy consumption / GHG-emissions, (hazardous) waste production, and (un) intentionally POPs emissions;
- ❖ In the objectives of the MEAs also attention and priority has been given to a preventive approach to tackle these environmental issues, in line with the general agreed priority hierarchy in environmental strategies;
- ❖ However the reality shows differently;
- ❖ The effectiveness, compliance with and implementation of MEAs remain rather low and needs to be improved;
- ❖ Implementation of MEAs tends to facilitate mainly end-of-pipe strategies;
- ❖ MEAs can support and facilitate widespread application of Cleaner Production;
- ❖ Cleaner Production and MEAs share a common goal of sustainable development;
- ❖ Cleaner Production is a preventive 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;
- ❖ Despite the successful results achieved in Cleaner Production activities the more general MEAs incorporate only to a limited extend this success-concept;
- ❖ It seems that the MEAs still are in the journey of the 'paradigm'-shift from a reactive or constructive approach towards a pro-active / preventive approach;
- ❖ It appears that stakeholders closely involved in MEA-implementation (e.g. MEA-focal points, service centres, etc.) have little knowledge of these new concepts;
- ❖ 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 preventive strategies. This will lead to strengthened partnerships, a more coherent approach to complex environmental problems, and improved capacity building for sustainable development;
- ❖ And at the same time members of the CP-community have limited knowledge of the objectives of MEAs and how their work can contribute to the achievement of MEAs;

- ❖ 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;
- ❖ National CP Centers are not really familiar with MEAs in general and the Stockholm convention in particular;
- ❖ In other words the communication and certainly co-operation between those networks is lacking, resulting in lack of exchange of information and sub-optimal implementation;
- ❖ Consequently there is a lack of concerted joint efforts between MEAs' implementation agencies and Cleaner Production practitioners to reach MEAs goals;
- ❖ Catalytic activities are needed to link the goals of MEAs and Cleaner Production.

Recommendations:

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.

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.

- ❖ Strengthen the incorporation of a CP-approach in the implementation plans of selected MEAs, at national, regional and global level, and thereby not only in its overall objectives but especially in its actual implementation mechanisms give adequate attention to the preventive approach;
- ❖ Strengthen the communication and co-operation between MEA and CP-networks;
- ❖ Upgrade the knowledge of MEA-networks on new innovative concepts, like Cleaner Production;
- ❖ Upgrade the knowledge of CP-networks on the actual objectives and plans of MEAs;
- ❖ Improve existing training programmes (focused on industry) in order to safeguard that both elements (e.g. CP and MEA) are equally covered;
- ❖ Improve the reporting of CP-projects, towards appropriate description how the CP-measures contribute to MEAs;

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Annexes

Annexe 1 – Ukraine country status report

ACME Global Status Report

- Annex 1 -

**Overview of the Implementation
of MEAs and CP in Ukraine
(Ukraine country status report)**

TABLE OF CONTENTS

1	United Nations Framework Convention on Climate Change (UNFCCC)	3
1.1	Status of political acceptance	3
1.2	Official action plans at the country and regional level	3
1.3	Priorities per country: regions and sectors	7
1.4	Stakeholders most active in the field	8
1.5	Disseminate of the information	8
1.6	Implementation of the UNFCCC s	9
1.7	Existing capacity and capability to further disseminate and implement the MEAs	9
1.8	Factors hampering proper implementation	9
1.9	Results achieved	10
1.10	Additional needs	10
2	Basel Convention	11
2.1	Status of political acceptance	11
2.2	Official action plans at the country and regional level	12
2.3	Priorities per country: regions and sectors	18
2.4	Stakeholders most active in the field	21
2.5	Dissemination of the information	22
2.6	Implementation of the Basel Convention	23
2.7	Existing capacity and capability to further disseminate and implement the MEA's	24
2.8	Factors hampering proper implementation	26
2.9	Additional needs	26

1 United Nations Framework Convention on Climate Change (UNFCCC)

1.1 Status of political acceptance

In June 1992, Ukraine signed the United Nations Framework Convention on Climate Change (UNFCCC). It ratified the Convention in October 1996, became an official Party to the UNFCCC in August 1997, and thus got listed in Annex I of the Convention.

The Kyoto protocol, agreed upon in 1997, establishes a binding GHG emission commitment among the Parties to this Convention. Ukraine joined the Kyoto Protocol on 15 March 1999, and ratified it in February 2004. In April 1999, Inter-Ministerial Commission on Climate Change was established by the Resolution of the Cabinet of Ministers of Ukraine.

Ukraine can generate significant revenues from the Kyoto Protocol by selling emission credits. The Industrial crisis in Ukraine in the nineties resulted in the reduction of the carbon dioxide emissions by about 60% between the years 1990 and 2000. Therefore, Ukraine is very interested in the implementation of both joint implementation (JI) and international emission trading (IET) flexible mechanisms.

The implementation of JI would cause a considerable inflow of direct investments in key sectors of the economy. It may also produce a number of additional benefits associated with the introduction of new energy-saving technologies, and the possibility for waste utilization in municipal services, agro-industrial production and other sectors of national economy.

Ukraine is a member of the Umbrella Group that includes also the US, Canada, Japan, Australia, New Zealand, Norway, and Russia. It signed the Memorandum of Intent and bilateral agreements on climate change mitigation with a number of other countries, including the United States and Canada.

The Ukrainian Government also cooperates with international agencies and institutions for development such as UNDP (United Nations Development Program), World Bank's IBRD (International Bank for Reconstruction and Development), and EBRD (European Bank for Reconstruction and Development).

Latest statements of the Ukrainian Cabinet of Ministers (March 2005) indicate that the Government is considering different potential projects and is attempting to encourage investments from the overseas.

1.2 Official action plans at the country and regional level

Little has been done in Ukraine to develop the appropriate institutional capacity to participate in international market-based flexibility mechanisms and to maximize revenues associated with JI and IET.

The institutional structure to deal with JI and IET is still not available. A number of existing institutions can play a decisive role in this context. These institutions include:

A. Ministry of Environmental Protection of Ukraine (MEP)

MEP is the primary institution responsible for all climate related issues, including those concerning the Framework Convention on Climate Change. It is the main coordinator of all Climate Change programs in Ukraine.

MEP formulates the emission control policy and its regional departments implement it. These departments work together with oblast (regional) administrations and report to them.

Main responsibilities of the MEP are:

- Environmental protection (policymaking, air pollution abatement).
- Environmental impact assessment of industrial activities and investments.
- Environmental monitoring and reporting.
- Initiation and financing of environmental protection activities.
- Nation wide promotion of R&D, education, and training.
- International cooperation (negotiating and signing agreements, exchanging data and expert opinions, participating in conferences and meetings).
- The affirmation that the Focal Point (i.e. Minister of the Environment and Natural Resources) fulfils the requirements of the UNFCCC.

B. State Hydrometeorology Service

The State Hydrometeorology Service under the MEP is entrusted with the national emission inventory coordination. A national inventory system of adequate quality has to be in place for Ukraine to be eligible to participate in the flexible mechanisms under the Kyoto Protocol. The present functions of the State Hydrometeorology Service are to:

- Carry out National Air Pollution Inventory which focuses primary on harmful pollutants.
- Be responsible for the national GHG inventory according to the IPCC methodology using data from energy statistics.
- Collect data for the inventory of GHGs.
- Develop a new emission inventory system.

C. Inter-Ministerial Commission on Climate Change

To fulfil national commitments under the UNFCCC, the Inter-Ministerial Commission on Climate Change has the following functions:

- Arrange the development of the national strategy and the national action plan to fulfil Ukraine's commitments under the UN Framework Convention and the Kyoto Protocol.

- Coordinate activities of the ministries, central and local executive bodies, enterprises, institutions and organizations, for the implementation of the national action plan to fulfil Ukraine's commitments under the UN Framework Convention and the Kyoto Protocol.
- Produce proposals on the implementation of the Kyoto Protocol mechanisms.
- Arrange the preparation of national communications of execution of the commitments as per the UN Framework Convention.
- Arrange the preparation of a national inventory of anthropogenic emissions by sources and absorption by sinks of all greenhouse gases not controlled by the Montreal Protocol.
- Review the UN Framework Convention and Kyoto Protocol, including inputs from other governments, Global Environmental Facility, World Bank, and other international organizations, and use them as a basis for the preparation of relevant proposals.

Other ministries and institutions can also play some role in Ukraine's climate change policy. These ministries and institutions are presented as follow with their main tasks:

A. Ministry of Fuel and Energy (MFE)

- MFE is responsible for all important strategic issues regarding national energy production and consumption. These include large-scale heat and power production which are the main emitters of GHG's.
- MFE supplies long-term forecasts for the power sector, information on industrial energy use, and formulates the technological policy for the power sector.
- The Department for Energy Conservation (former State Committee for Energy Conservation) at MFE supports the activities in the field of energy conservation, energy efficiency and climate change.

B. Ukrainian Ministry of Economy and European Integration

The Ukrainian Ministry of Economy and European Integration is responsible of:

- Analysis and formation of State policy of economic and social development.
- Forecasts of economic and social development.
- Establishment of national priorities of economic development.
- Elaboration of coherent foreign trade policy.
- Economic and social cooperation with the European Union.

C. State Committee on Statistics of Ukraine

The State Committee on Statistics of Ukraine is responsible of:

- Collection of statistical data on social and economic development.
- Convergence of the Ukraine system of national accounts with the UN standard.
- Insurance of the reliability of the statistical information.

D. Ukrainian Ministry of Finance

The Ukrainian Ministry of Finance is responsible of

- Securing unified finance, budget and taxation policy directed to the implementation of State policy of economic and social development.
- Overseeing the administration of the national budget of Ukraine.
- Coordinating finance and taxation policy of other ministries.
- Securing concentration of financial resources on key directions of economic and social development.
- Elaborating strategy of internal and external borrowing.
- Potentially playing an active role in introducing GHG emission trading as a potential distributor of revenues from emission allowance sales.

E. Ministry of the Foreign Affairs of Ukraine

The contribution of the Ministry of the Foreign Affairs of Ukraine could be in:

- Coordination of multilateral and bilateral negotiations.
- Providing information for international contracts with possible governmental guarantees.

F. Ministry of Transport

The contribution of the Ministry of the Foreign Affairs of Ukraine could be in:

- Formulating governmental policies for the sector.
- Providing the Cabinet with forecasts of sector development
- Formulating policies of technological change in the sector.
- Formulating the emission control policy in the transportation sector, and possibly supplying a long-term forecast of GHG emission from mobile sources.

Apart from the government sector, private companies are expected to take part in the GHG market, most notably consulting firms, banks, insurance firms, energy and environmental service and audit companies.

Building institutional capacity will entail certain budgetary implications, such as direct expenditures required for the establishment of Kyoto Protocol institutions in the country,

and the resources required for establishing relevant policies and ensuring appropriate compliance with the international rules. Moreover, the budgetary constraints will substantially differ for Track 1 and Track 2 eligibility.

Despite the numerous existing institutions potentially dealing with climate change issues, Ukraine should establish a central JI/IET office.

The European Commission's TACIS programme, providing technical assistance for newly independent states, has appointed a team led by ICF Consulting to provide advisory services to the Governments of Belarus and Ukraine over 2004-2006 to support the countries' implementation of international climate change commitments. The main objective of the project is to assist Ukraine in: 1- establishing permanently operating national GH inventory system; 2- developing an action plan as for implementation of JI administrative structure; and 3- preparation of the Second National Communication.

1.3 Priorities per country: regions and sectors

In 1998, the Government of Ukraine, in order to meet its commitments under the Convention, prepared and submitted to the Secretariat of the UNFCCC its First National Communication and First National Inventory.

The First National Communication, prepared in compliance with the requirements of the Secretariat, contains comprehensive and reliable information on the country. This includes modalities of accession to the UNFCCC, analysis of the economic situation, position of Ukraine within the regional context, main trends of economic development, assessment of the status of GHG emissions, national policies in relation to the global climate system, and voluntary measures aimed at the reduction of greenhouse gas emissions.

The First National Communication gives an estimate of the potential emission reduction at the national level. Among the major measures on climate change mitigation at the national level, priority is given to the introduction of energy saving equipment and technologies, active measures on energy conservation in all sectors of the economy, and to the development of renewable sources of energy and nuclear power.

The first GHG emission inventory was contained in the first and only National Communication of Ukraine (NC1) that has so far been forwarded to the Secretariat of the Convention. This complete study defines and quantifies the main sources of greenhouse gas emissions and their sinks. There are two very important aspects of the inventory: first, it gives a comprehensive, profound analysis and methodology for determining the emitters of greenhouse gas emissions and their sinks; second, it includes improved mechanism and methodologies of GHG emission inventory used by the UNFCCC. The inventory provides data on fuel combustion in all sectors of the economy, and on the share of different GHGs in the quantity of greenhouse gas emissions.

Among all sectors, emphasis was put on the largest emitters, such as power and transport. In 1990, the power sector accounted for 44% of the total emissions, while the transport sector accounted for 8 %. As for the rest of the sectors, 31% of the emissions were attributed to the industry, 13% to public services, and 3% to agriculture.

With regards to the Climate Change Conventions and Kyoto Protocol, there are no specific regions defined for implementation. However, it can be seen that there is more attention to the more industrial and energy demanding areas. These are East and South East parts of Ukraine (Kharkov, Lugansk, Dnepropetrovsk, Donetsk, Zaporozhie regions). Heat and power generation is relatively more evenly spread over the country.

1.4 Stakeholders most active in the field

Currently, the only Ukrainian consulting companies active in the field are the ones registered within Ukrainian State Committee for Energy Conservation (end 2004). Recent merging of the Committee with the Ministry of Economy reduces the possibility that the licenses of these consulting companies and their further involvement into the process will be extended.

The most active players in the field are the Ministry of Environment Protection of Ukraine and its' Regional Departments, Verkhovna Rada (Parliament) Committee for Environment Safety, and the Ministry of Fuel and Energy.

The most active university and/or research institutes in this field is the Kiev Polytechnical University (KPI). KPI has established an Energy Managers Training Institute and is training industrial environmentalists.

Although there is an *Ukrainian Network "Energy Efficient Cities" (UNEEC)*, civil society organizations are not active players in relation to the UNFCCC initiatives of Ukraine. UNEEC was established in 1999, and is a voluntary, non-governmental, non-profit organization whose members are mainly small and medium size municipalities. Currently, UNEEC has more than 40 member municipalities from all over Ukraine. The purpose of the organisation is to assist local governments, and business and local communities in solving their energy problems through promoting energy efficient political and environmental innovations.

Despite the number of registered energy and environment related consulting companies, these companies are not directly engaged into addressing the UNFCCC s issues.

1.5 Disseminate of the information

Many documents have been prepared and submitted to the relevant central government bodies and members of the inter-sectoral Commission. These documents mainly are:

- Ratification Package describing the status of the issues for further consideration and ratification procedures by Verkhovna Rada;
- Framework Convention Implementation Strategy;
- Materials and Guidelines prepared in the frames of Canadian - Ukrainian Project Climate Change Initiative;
- Memo for the national Security Council.

Furthermore, a number of training seminars, workshops and round tables have been performed in the framework of Technical Assistance Projects (e.g. TACIS, WB, UNIDO, UNEP). Representatives of all national economy sectors, local authorities, and big industrial companies (i.e. Ministers, Chairmen of the Parliament Committees, Municipal services, Heads of the companies) participated in these events. These events increased the awareness level among attendants; however, there is still no wide spread awareness at the different management levels.

The Aarhus Declaration requires Ukraine to provide information access for the public. Generally Ukraine fulfils these obligations. The basic means for the dissemination of

information are the press, radio, TV, printed media, and Internet information resources (e.g. the registered web site of the Ministry of Environmental Protection of Ukraine (www.menr.gov.ua) highlights the major relevant events in the country; however, the current info on the site is a bit outdated).

1.6 Implementation of the UNFCCC s

None of the Ukrainian enterprises has started the implementation of the UNFCCC. Furthermore, only 4 enterprises have started the implementation of the Pilot projects (power sector, construction materials, coal mining and agriculture). Hence it is early to assess the achievements or shortcomings of the implementation. However, a number of companies from the most active sectors listed above are currently preparing PINs for the future JI Projects.

Support to the Pilot projects mentioned above is provided in the frames of ERUPT Programme, financed by of Switzerland and Netherlands Governments, international organisations like WB, EU etc.

1.7 Existing capacity and capability to further disseminate and implement the MEAs

There are not many institutions capable to provide support to the UNFCCC's implementation. In addition, at the moment, it is not possible to indicate the number of companies capable to provide full-scale support to UNFCCC's implementation. The engineering consulting companies dealing with matters closely related to the MEA may be able to provide some support to UNFCCC's implementation. However, currently in Ukraine there is no company capable to deliver staff training aiming at the UNFCCC's implementation. The skill level of the trainers is not enough to perform this kind of activities. At the moment, training was just delivered through some technical assistance projects.

1.8 Factors hampering proper implementation

The common factors impeding the implementation of the UNFCCC could be summarized as follow:

- Incomplete Administrative Restructuring process (i.e. there is still no clear boarder lines between the functions and responsibilities of different Ministries and state bodies);
- Lack of the relevant infrastructure on the national level;
- Weak awareness from the subject businesses about the financial benefits of JI Projects implementation;
- Lack of technical and financial means for emissions monitoring;
- Lack of the national GHG Emissions Register;
- Lack of general public awareness about MEAs like Kyoto Protocol, Basel Convention etc.;

1.9 Results achieved

Quantitative or even qualitative assessment of the results achieved and of the environmental impacts is not possible due to the absence of the actual implemented projects.¹ However, some sectors/businesses are active in developing and implementing JI projects. These sectors are the following:

- Power Sector (including heat generation and supply);
- Construction materials industry;
- Chemical industry;
- Municipal household sector

1.10 Additional needs

Awareness about the general worldwide environmental concerns and the current trends to address environmental issues is still low both by public and businesses. Even though the businesses sector declared their endorsement to the declaration, and the Authorities have started imposing fines, neither a real concern about environment nor an understanding of the potential benefits from the investments into environment protection exists.

Changing of the situation requires certain measures to be taken. These measures include:

- Clear demonstration (using concrete examples and figures) of the financial outcome of the implementation of the UNFCCC and the application of environmental protections. These demonstrations should include all type of saving (cleaner production energy efficiency, etc.) and not just the reduction in taxation burden (if any)² of the companies making investments in the light of UNFCCCs.
- Establishment of the National GHG Register, and National wide infrastructure for JI Projects implementation.

¹ 4 to 5 JI Pilot Projects are currently in the development/initial implementation phase.

² Taxation matters are rather painful issues in the country. It is hardly to be expected that the Government in the nearest future will make taxation privileges for the industrial companies proceeding this way.

2 Basel Convention

2.1 Status of political acceptance

Ukraine acceded the Basel Convention on 1 July 1999 by adopting the “On acceding the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal” law. The rise in the public concern after the non-authorized import of hazardous wastes to some Ukrainian regions (e.g. to Rivne region) placed pressure on the government to adopt this law.

Since that time Ukraine implemented the system of state monitoring for the transboundary movement of hazardous wastes, and adopted a set of legislative acts for the strengthening of control over transboundary movement and disposal of hazardous wastes. The major three Resolution of the Cabinet of Ministers of Ukraine in this aspect are:

- Resolution No. 1120 of 13.07.2000: “On approval of Regulations on control of transboundary movements of wastes and their utilization/disposal and Yellow and Green lists of wastes”. Provisions for the monitoring of transboundary movement of hazardous waste are based on the national legislation recommended by the BC Secretariat for the countries-BC parties. National lists of the Yellow and Green wastes are created on the basis of A and B lists, accordingly, approved by the 3rd Conference of the BC Parities.
- Resolution No.574: “On assignment of the Competent Authority and Focal Point to fulfil obligations under the Basel Convention of Transboundary Movement of Hazardous Wastes and their Disposal”;
- Resolution No. 1219 of 19.08.2002: “On the approval of procedure and rules for the compulsory insurance of responsibility of exporter and person responsible for recycling (disposal) of hazardous waste as regards compensation for the damage that can occur to the human health, property and environment during transboundary movement and recycling (disposal) of hazardous waste”.

Thy national definition of hazardous wastes, when used in the above mentioned resolutions, is: “Hazardous wastes” are wastes included into division A of the Yellow List of wastes, wastes having one or more hazardous properties mentioned in the List of hazardous properties, or wastes that contain materials in large enough quantities to reveal these mentioned hazardous properties. The Yellow List of wastes is approved by the Cabinet of Ministers of Ukraine. The List of hazardous properties is approved by the Ministry of Environment Protection, and is included into the Green List, which is approved by the Cabinet of Ministers of Ukraine.

Export of hazardous wastes is carried out in accordance with the Basel Convention provisions. Import of wastes in Ukraine with the aim of their storage or disposal is forbidden based on the Law of Ukraine “On wastes” adapted on 5 March 1998. The Ministry of Environmental Protection of Ukraine, which is designated as the BC Competent Authority in Ukraine, issues or decline permits for the export, import or transit of hazardous wastes. Import of hazardous wastes could be permitted providing that there are appropriate capacities for their recycling, and that the appropriate regional authorities of the Ministry of Environmental Protection and the Ministry of Health (sanitary-epidemiological services) had priory authorized the import.

Pursuant to the Law of Ukraine “On the licensing of some types of business activities”, the Ministry of Environmental Protection is authorized to issue licenses to the entities carrying out activities in the field of hazardous waste handling and to monitor compliance of license terms by hazardous waste recycling operators. Such a license is a requirement for getting hazardous waste import permit.

2.2 Official action plans at the country and regional level

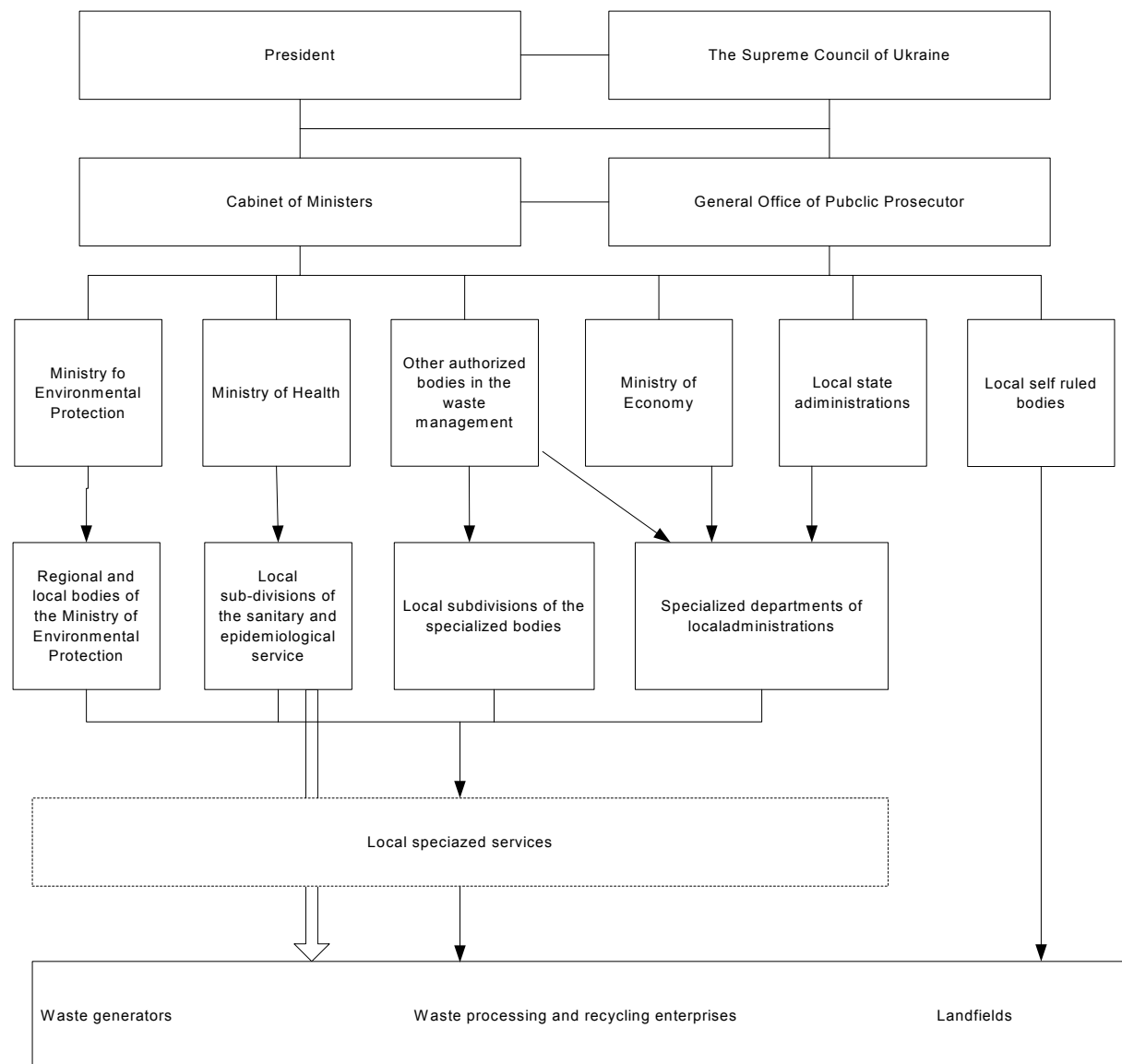
National Focal Point

The Ukrainian National Focal Point to the Basel Convention is the Ukrainian Research Institute of Environmental Problems in Kharkiv (Laboratory of Legal Provision of Environmental Safety) due to the Resolution of the Cabinet of Ministers of Ukraine No. 1433 of 13 September 2000).

Ukraine is a member of the Regional Centre of the Basel Convention for CIS countries established in 1981. Activities of CIS RCBC cover the following countries of the CIS: Republic of Azerbaijan, Republic of Armenia, Belarus Republic, Georgia, Republic of Kazakhstan, Kyrgyz Republic, Moldova Republic, the Russian Federation, Republic of Tajikistan, Turkmenistan, Republic of Uzbekistan, and Ukraine.

The main objective of CIS RCBC is to implement capacity building programs, including training, re-training and qualification upgrading, for the personnel of the regional countries on the handling of wastes and their transboundary movement. The main functions of CIS RCBC are: training, transfer of advanced technologies for wastes treatment and low-wastes technologies, information exchange on the environmentally sound handling of wastes, consulting the countries of the relevant region on wastes handling and trans-boundary movement of wastes, awareness-building of the public on the topics of wastes handling, development of project proposals initiated by the regional countries on different aspect of the Basel Convention, fostering of partnership with industry and business on the environmentally sound management of hazardous wastes.

The Ukrainian state bodies manage the Ukrainian national waste management. These state bodies include the central bodies of legislative and executive power, the regional executive bodies, and the local authorities and their executive bodies. Waste generators and waste disposal and landfill entities are the objects of the management. The organizational structure of the state waste management sector is presented below.



Verkhovna Rada (Supreme Council) of Ukraine

Verkhovna Rada (Supreme Council) of Ukraine is the sole legislative power body in Ukraine, and its main role includes: adoption of laws, approval of the national programs including the environmental protection programs, and the approval upon address from the President of Ukraine of decrees announcing certain localities as zones of environmental emergency.

The President of Ukraine

The President of Ukraine performs a regulative action through issuing Decrees. Some of these decrees may touch upon particular issues of waste management, requiring an immediate solution.

The Cabinet of Ministers of Ukraine

The Cabinet of Ministers of Ukraine is the highest body within the system of executive power authorities. The Cabinet is responsible to the President of Ukraine, and accountable to the Supreme Council of Ukraine. The responsibilities of the Cabinet include developing and implementing the national programs of economic, scientific, technical, social, and cultural development of Ukraine. The Cabinet also directs and coordinates the activities of the ministries and the other executive power bodies.

The Ministry of Environmental Protection (MEP)

The Ministry of Environmental Protection (MEP) is the main authority regarding the execution of the Basel Convention. The activities of the Ministry are directed and coordinated by the Cabinet of Ministers of Ukraine. The Ministry organizes execution of legislative acts and carries out control of their realization, elaborates proposals on legislation improvement, and is the key administrator of environmental protection fund. The main functions of MEP include:

- Carries out state control over observance of rules, norms, limits, and quotas in the field of environmental safety requirements in the field of waste management;
- Organizes and carries out state environmental expertise;
- Organizes, within its competence, the conduction of natural environment monitoring, and the establishment and functioning of environmental and other information systems;
- Approves or conforms, following established procedure, rules, and norms on natural environment protection, environmental safety, and waste management. Also carries out analysis on the application of these rules and develop recommendations on the elaboration of other rules, norms;
- Issues, following legislatively established procedure, permits, limits, and quotas for emissions of pollutants in natural environment, and allowable levels of harmful impact;
- Issues, pursuant to the law, permits for carrying-out operations in the field of waste management;
- Ensures approval of the draft documents for allotting of land plots for placing of environmentally hazardous and other objects.

The Ministry has regional representative offices i.e. oblast departments for environmental protection, and city environmental inspectorates.

Ministry of Health

The Ministry of Health deals with all aspects that could have harmful public health impact. Its functions include: perform control and supervision over observance of sanitary legislation; state standards criteria and requirements;; ensure sanitary and epidemic safety of population; ensure carrying-out state sanitary-hygienic expertise; investigates, analyzes, and forecasts indicators of human health situation depending on condition of human vital activity environment; participates in working out measures, aimed at non-admission of harmful impact of environmental factors on human health; approves state sanitary norms, and rules; conforms, following legislatively established procedure, all state standards, technical specifications, industrial samples, and other normative-technical documentation of objects.

The organizational structure of the Ministry includes the sanitary-epidemiological service. The state sanitary and epidemiological service of Ukraine performs state sanitary and epidemiological supervision of the observance of sanitary legislation by juridical and private entities. The purpose of the supervision is to prevent, reveal, abate or liquidate the harmful impact of the waste on the natural environment and human health while it is generated, collected, transported, stored, processed, utilized, disposed of, detoxified and buried. The structure of the sanitary and epidemiological service includes the bodies, institutions and organizations of sanitary and epidemiological profile of the Healthcare Ministry of Ukraine, and respective subdivisions of other ministries and departments, legally defined.

Other Ministries and Offices

- The Ministry of Finance role is to ensure state budget, including reserve fund, financing of environmental protection measures.
- The Ministry of Economy conducts economic feasibility of the environmental protection measures funded by the state budget, including reserve fund.
- The Ministry of Emergency Situations main authorities are the prevention and elimination of consequences of natural and man-caused emergencies and disasters, state control of fire safety.
- The Office of Public Prosecutor is entrusted with supervision and observance of laws related to economic, international relations, environmental protection, customs, and foreign-economic activities. Organizational structure of the office includes departments of environmental procurement.
- The local self-government system. It comprises the following entities: territorial communities; village, settlement, and city councils; village, settlement, and city mayors; executive bodies of village, settlement, and city council; rayon and oblast councils, which represent joint interests of territorial communities of villages, settlements, and cities; and bodies of citizens self-organizations. The Law on Waste contains a number of waste planning provisions directed at national, regional and local level. These provisions places the Local State Administration under the obligation to oversee that regional and local waste management programmes, as well as the so-called sanitary waste control programmes, are developed and implemented by the Local Self governments.
- The Local state administrations together with the local bodies of the MEP define the list of waste handling sites, which shall be included in the Register. They also notify owners of the necessity of submitting a passport. The local authorities dispose of broad discretionary powers in this respect. According to information received from one oblast, for example, according to a rule exercised at the local level, the sites storing less than 20 tons of wastes are not exempted from the passport requirement. The oblast level has little or no interference with the local authorities regarding which sites are obliged to provide a passport. The passport contains detailed quantitative and qualitative information about the wastes disposed of at the site, their quantitative and qualitative composition, their origin, their technical characteristics, and information on control and safe operation methods.

Ukrainian legislation attaches the responsibility for waste primarily to the owner of the waste. It defines wastes without an owner as abandoned wastes. If abandoned waste is found on land owned by a private person, this person has the obligation to notify the authorities thereof, and shall take measures to identify the owner of this waste, degree of

its hazardousness, ensure that the waste is entered into books and records, and decide on its management.

The Law on Wastes considered abandoned waste located on the premises of a territorial community to be under the ownership of that respective territorial community. Abandoned waste located in the territory of Ukraine, but outside the property of a territorial community, is considered to be owned by the State. In Other words, where the owner of abandoned waste cannot be identified, either the State or the local governments shall take responsibility for that waste.

Specific action plans launched

On 05.03.1998 Verkhovna Rada (Parliament) of Ukraine adopted the national strategy of wastes generation minimization. This strategy was included into the legislative document “The main directions of the state policy in the field of environment protection, natural resources use and ecological safety ensuring”.

The National Hazardous Waste Management Program, adopted in September 2000, takes all the provisions of the Basel Convention into account. The program adopts the principles that waste shall be disposed of at the source, and that the generation of waste shall be minimised at all levels.

The National Hazardous Waste Management Program should be mainly financed from the state budget, the State Environmental Protection Fund, local budgets, and own funds of industrial enterprises – waste generators. Total expenditures of the activities envisaged by the programme are estimated to be approximately 78 million UAH. However, during the last five years, the Supreme Council of Ukraine (Verkhovna Rada) and the Government have adopted nearly 1,000 different development programs and about 200 concepts. Practically all of these programs stipulate development of corresponding sub-programs at regional level. The large number of programs and limited budget has resulted in the fact that many programs remain unimplemented. However, according to the Ministry of Environmental Protection, the National Waste Management Program is among the few that are financed (about 50% of the planned financing).

Financial and regulatory supportive mechanisms

Regulatory mechanism

The Law on Environmental Protection adopted in 1991 contains general provisions on the environmental protection including waste impact. It makes waste disposal subject to the following regulations: 1-need for a permit, 2- priority of reuse and recovery over disposal, and 3- Safety of human health and the environment when disposal is adopted.

The Law on Wastes was first adopted in 1998. Its provisions on hazardous waste management were strengthened when it was substantially amended in 2002. The Law on Wastes contains a number of measures and requirements that encourage the reuse and recycling of wastes. These measures require the local state administrations and the local self-government to:

- Facilitate the collection of waste for recycling.
- Issue permits for collection of recyclable waste.

- Adopt local and regional waste management programmes based on the waste management hierarchy.

In addition to the two laws mentioned above, other relevant laws regulating hazardous waste handling are:

- “On the withdrawal from circulation, treatment, utilization, elimination or further use of unsound and hazardous products”, adopted on 14 January 2000.
- “On transportation of dangerous loads”, adopted on 6 April 2000.
- “On the enhanced danger sites”, adopted on 2 March 1995.

The implementing of the legislations is set through many Resolutions issued by the Cabinet of Ministers. In respect of the hazardous waste management, the main resolution is Resolution No. 1120 of 13 July 2000 “On approval of Regulations on control of transboundary movements of wastes and their utilization/disposal and Yellow and Green lists of wastes” of the Cabinet of Ministers

Further specifications of the stipulations of Cabinet of Ministers Resolutions are usually contained in Ministerial Orders.

The waste legislation is supplemented at the oblast and local level by local and regional waste management programmes and City State Administration Resolutions, which include provisions on collection, recycling, and disposal of wastes.

Financial mechanism

Funds for public environmental expenditure come from general taxation, via the state budget, and from pollution charges and fines, via the Environment Funds. Pursuant to the “Procedure for development, approval, and revision of the limits for waste generation and disposal” (approved by the Resolution of the Cabinet of Ministers of Ukraine No. 1218 of 3.08.1998), every waste owner shall have limits for waste generation or disposal, approved by the regional bodies of the Ministry of Environmental Protection. As revenues are collected by imposing user charges on the basis of these limits, the revenues are then shared among the national, regional and the local governments, and can only be spent on environmental activities.

On 24 May 2004, the Cabinet of Ministers set up a specialized fund for the motivation and financing of environmental protection measures.

Among the main objectives of the Fund are:

- Promotion of additional funds to finance environmental protection measures.
- Promotion of market mechanism to ensure financing of the environment protection.

Currently, the Ministry of Environmental Protection has developed and submitted to the stakeholders a draft of a new resolution of the Cabinet of Ministers titled “On the procedure for financial supporting the activities of State Environmental Protection Fund based on low interest rate credits of commercial banks”.

2.3 Priorities per country: regions and sectors

There are four classes of hazardous waste in Ukraine are classified in four classes (I to IV); Class I is the most dangerous, and Class IV is the least dangerous. The classification of a waste depends on the content of high-toxic compounds in the waste, or on the list of wastes from the State Classifier of Waste DK 005-96. Currently, experts are reviewing and evaluating the Classifier to make it more harmonized with the European list of wastes.

The main generators of hazardous waste in Ukraine are enterprises of ferrous and non-ferrous metallurgy, chemical industry, and machine building (electroplating production) industry. Metallurgy and petrochemical industries account for about 70% of Ukraine's gross product and are, thus, the largest generators of wastes. Also, significant amounts of waste are generated by the mining and processing industries. Waste includes large-tonnage of ashes and ash-and-slag waste of thermal power plants, coal mining and coal-preparation, complex ores dressing, slag of metallurgy production, and sludge of aluminous production.

Machine building industry in Ukraine uses old and worn-down production equipment with a low efficient consumption of raw materials. Thus, Machine building industry is the third largest producer of waste in the country after the mining industry and the chemical industry. This sector consumes one of the biggest shares of the resources and raw materials of all industry sectors in Ukraine.

The machine building industries have their own manufacturing, surface treatment, and assembly departments. The surface treatment departments, with electroplating and painting workshops, have the biggest negative impact on the environment. Inefficient use of heavy metals, water and energy and the resulting wastewater and sludge are the main reason of waste production in the electroplating departments. In the painting departments, the inefficient use of paint and solvents leads to the evaporation of solvents to the atmosphere, and the precipitation of paint sludge as solid waste

Regions to be targeted per the Basel Convention

Ukraine has 3 major economic regions. These regions are:

- Donetsk-Dnipro: It hosts mining, metallurgical, chemical and machine building enterprises.
- Central-Western: It hosts processing, light and food-processing enterprises.
- Southern region: It hosts shipbuilding enterprises, seaport economy and recreational facilities.

Out of the 27 regions in Ukraine, four regions, namely Dnipropetrovsk, Donetsk Zaporizhia and Luhansk oblasts, generate about 90 per cent of the hazardous waste generated annually in Ukraine. This is because hazardous waste generation is closely linked to the mining, metallurgical, chemical and machine building industries, which are located in the regions.

Table 1. Generation and handling of toxic (all 4 classes) wastes in the Ukrainian regions, 2002 (in thousand tones)

Region	Toxic waste	Utilized/recycled	Destructed	Disposed at	Accumulated on the sites
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	generated			special dumps	of enterprises
Autonomous Republic of the Crimea	437.8	19.8	0.0	138.7	10528.9
Vinnitsa	36.8	0.1	0.3	2.0	434.2
Volyn	2.4	0.7	0.0	0.0	2.5
Dnipropetrovsk	37191.9	13521.9	3.3	24788.0	1782385.2
Donetsk	23719.3	9760.3	40.2	10647.8	426790.9
Zhitomir	0.7	0.3	0.0	-	1.1
Zakarpatska	6.9	1.4	1.1	1.4	6.3
Zaporizhia	5518.3	2377.3	0.8	1793.2	105272.9
Ivano-Frankivsk	857.8	384.2	22.2	527.5	45937.3
Kiev	659.4	80.7	0.0	553.0	21403.6
Kirovograd	794.4	4.6	0.1	784.3	53831.1
Luhansk	5391.8	3397.9	221.3	2469.0	100445.8
Lviv	756.4	119.7	9.4	552.9	81223.7
Mykolaiv	311.0	802.5	17.1	178.6	1947.9
Odessa	31.2	3.5	0.1	0.6	2006.6
Poltava	230.8	9.1	20.5	157.5	5289.9
Rivno	26.8	15.0	2.4	8.4	16914.8
Sumy	397.3	39.6	46.0	278.1	28390.5
Ternopil	0.5	0.4	0.0	0.0	0.5
Kharkiv	978.4	372.3	13.8	453.2	32929.0
Kherson	7.2	0.2	135.0	0.1	125.8
Khmelnitskiy	4.8	1.3	0.0	0.1	7.2
Cherkassy	148.9	9.5	88.9	23.3	4611.8
Chernivtsi	21.7	0.0	0.0	0.0	194.2
Chernyiv	58.1	0.4	5.8	17.4	1995.5
City of Kiev	13.2	1.4	0.1	0.3	194.4
City of	1.1	0.1	0.0	0.0	1.6

Sevastopol					
Total, Ukraine	77,604.9	30,924.2	628.4	43,375.4	2,722,873.2

Source: State Statistics Committee

The table shows that huge amounts of waste are accumulated on the sites of industrial enterprises. There is a profound lack of an effective nation-wide infrastructure for hazardous waste handling (collection, treatment and disposal systems) in the country. Consequently, these and some other regions experience severe difficulties in handling and disposal of hazardous waste. According to the Ministry of Environmental Protection, 95% of toxic wastes are stored at the sites of the enterprises that generated the wastes. Surface dumpsites (or waste heaps) are the locations where industrial waste has been dumped for years and they are usually located next to the enterprises generating the waste in order to minimise transportation distance.

The most frequently occurring contaminants are hydro-carbons, heavy metals (galvanic sludge), spent emulsions and cooling fluids, oil sludge, paint and solvent wastes, spent moulding forms, mercury containing lamps, building material, metal scrap, organic solvents, chemicals, and rubber.

The construction of specialized hazardous waste dumps has been on the national agenda since the 80's. This issue is still not resolved due to the public resistance about the locations of the dumps, lack of political will, and underestimation of the environmental danger.

Priorities

National environmental policy sets the following targets in the field of hazardous waste management:

- Establishment of specialized enterprises for hazardous waste recycling and destruction.
- Establishment of environmentally sound disposal sites for hazardous wastes.
- Minimization of wastes generated in the production processes.
- Maximum recycling and utilization of waste as secondary raw.
- Application of least cost environmentally sound methods of waste processing.

Target group acceptance of the priorities

The legislations in place in Ukraine force industrial enterprises and other entities and organizations that are dealing with hazardous wastes to comply with the following rules:

- Ensure appropriately storage of hazardous wastes in accordance with the sanitary, environmental and fire protection norms and regulations.
- Prevent and reduce generation of hazardous wastes.
- Get necessary permits for the generation and storage/dumping of hazardous wastes in duly terms.
- Use only the sites agreed in the permit for the purpose of hazardous waste handling.

- Keep hazardous waste record.
- Ensure training, retraining and certification of the staff dealing with hazardous wastes.
- Eliminate storage and disposal of hazardous waste on non-authorized locations/sites.
- Get the license for hazardous waste handling in duly established procedure.

The existing system of environmental monitoring is not able to solve the waste prevention problem since it's based only on the control and punishment for non-compliance to the environmental norms and regulations. Ukraine's current system of pollution charges, taxes and tariffs does not provide adequate incentives for pollution prevention or for investment in pollution controls, especially at the local level.

Old and poorly maintained industrial plants and lack of effective monitoring constitute the basic causes for the present high level of generation of hazardous waste in Ukraine. Relative cheap natural resources, rather low waste fees and weak enforcement of the environmental regulations, and a generally unfavourable investment climate do not provide the enterprises with incentives to carry out investments in new and cleaner technologies that will reduce the volume of hazardous waste generated.

Plant directors and managers with authority to install treatment equipment are often unwilling to risk a decrease in productivity and to drain scarce capital by investing in something with no perceived short-term economic benefits. Even the largest and most profitable enterprises often insist that they cannot afford to install, operate, or maintain treatment equipment and recover contaminated areas.

2.4 Stakeholders most active in the field

Local government:

The National Programme of hazardous waste handling require the Oblast (Regional) Administrations to identify the entire quantity of waste generated in the region, and to develop the regional plan to reduce waste generation. The programme also envisages the establishment of hazardous waste handling centres on the regional level. In co-operation with the regional departments of the Ministry of Environmental Protection, the regional authorities of Vinnytsya, Donetsk, Zhitomir, Zaporizhia, Mykolaiv, Odessa, Poltava, Rivne, Sumy, Kharkiv, Chernyiv, and Chernovtsy, and the City Administration of Kiev have established such programs.

In addition, a regional waste handling centre was established in Donetsk region. Also, similar activities are happening in Zaporizhia, Kiev, Luhansk, Poltava and Lviv regions.

Industry associations

Industrial associations are not well developed in Ukraine. Hazardous waste is recycled at the authorized and licensed enterprises that have appropriate equipment and technologies for processing and destruction of these wastes. The JSC "Mykitrut" (Donetsk region) which is the only one company in Ukraine that is able to process all types of mercury containing wastes. ISTA Corporation (Dnipropetrovsk) produces lead batteries and offers the whole range of services in their recycling. Being a ACCORD (Cherkassy) is a member of the Hazardous Waste Handling Corporation and recycles paint, enamel, varnish wastes, spent electrolytes, galvanic sludge, and obsolete medical chemicals, etc.

Universities and research institutes

Universities and research institutes are mostly involved into expertise evaluations of different issues in the field of hazardous waste handling, e.g. investigation of hazardous waste physical-chemical properties, development of waste handling technologies, investigation of waste impact on human health, and improvement of legislation in the field of hazardous waste management.

Research institutes are also involved into solving tasks stipulated in the National Hazardous Waste Handling Programme. Some of these tasks are:

- Development of standard designs and design solutions for establishment of regional sites for destruction, recycling and disposal of hazardous wastes.
- Elaboration of proposals on destructions and processing of PCB containing wastes.
- Inventory of dumpsites to elaborate further environment protection measures.
- Development and implementation of waste recycling methods for regeneration of heavy and ferrous metals.

Civil society organizations and other not-for-profit organisations

Within the last years, the participation of non-governmental organizations in the issues related to hazardous waste handling has increased in Ukraine, especially when it relates to the import of hazardous waste to Ukraine.

It is rather difficult to clarify the number and names of NGOs active in the field of hazardous waste handling due to the inconsistency of available information. However, "Zelenyi Svit" and MAMA 86 seem to be the most active NGOs in this domain.

2.5 Dissemination of the information

In general, the level of awareness about the existence and requirements of the Basel Convention among the governmental organizations, industry and public is low. Knowledge is mainly disseminated among professionals and experts from the Ministry of Environmental Protection, Ministry of Health, MEP regional divisions, MH sanitary epidemiological services, and appropriate research institutes.

Information about the Basel Convention, text of the convention, and related Ukrainian legislative acts are available online at www.waste.com.ua

Notification about implementation of monitoring procedure for transboundary transportation of hazardous wastes, pursuant to the Resolution of the Cabinet of Ministers No. 1120 of 13.06.2000, was published in the official press. Just after the procedure became effective (01.09.2000), official information about the above procedure was submitted to the BC Secretariat.

Ukraine takes an active part in the work of the BC Regional centre in Bratislava for the countries of CEE. Dozens of leading Ukrainian experts from governmental, research, and industrial organizations dealing with hazardous waste management pursued training that was organized by the centre.

The Advanced Training Institute under the Ministry of Environmental Protection has organized training on the functioning of transboundary movement monitoring system.

Based on Interviews with governmental officers and industry representatives, there is need to get information and experience on the following issues:

- Improvement of the legislative base in the field of hazardous waste handling and minimization.
- Modernisation of the technical solutions in hazardous waste minimization, processing, destruction, disposal.
- Development of occupational safety in handling hazardous waste.
- Acquirement of international experience in disposal of hazardous waste.

2.6 Implementation of the Basel Convention

National hazardous waste handling programme envisages 22 demonstration projects. Few of these projects are:

- Establishment of toxic waste destruction and recycling enterprise in Kirovograd region.
- Destruction of beryllium waste generated by ZAKID company.
- Rehabilitation of existing disposal sites in Vinnitsa, Donetsk, Zaporizhia and Cherkassy regions.

The implementation of some of the projects is already accomplished, however due to the limited funding there are proposals to prolong the programme till the year 2007. The main focus of the programme is on the safe disposal and recycling of generated hazardous waste rather than to the prevention of their generation.

Cleaner production is still at its primitive stage in Ukraine. The Basic Capacity Level (i.e. the minimum level needed for cleaner production concepts and principles to be disseminated spontaneously throughout industry and society) is unlikely to be reached in the near future in Ukraine. The expansion of cleaner production requires the adoption of some environmental policy measures, especially financial incentives for. Ukraine needs to apply the mix of policies and instruments, which is best adapted to its circumstances, facilitating a greater use of integrated, preventive environmental strategies.

The main achievements in the promotion of hazardous waste prevention were mostly gained in the projects financed within different technical assistance programmes.

Examples of Implementation Projects

- I. The **Donetsk/Dnipropetrovsk Industrial Waste Management Project** was a demonstration project under the regional Environmental Policy and Technology Project (EPT). Its purpose was to assist countries in the NIS to undertake more effective environmental management of contaminating industrial facilities, and to demonstrate the economic benefits of pollution prevention and recycling to industry business operations. It established a foundation for a practical, cost-

effective waste management program that can be undertaken by Ukraine's Ministry of Environmental Protection. The tasks included environmental auditing of enterprises, efforts to improve methods of government regulation, logistical support for interventions, promotion of public involvement in the environmental decision-making process, and training and application of the ISO 14000 environmental management standards series. For example, at AZOVSTAL, Ukraine's largest steel making facility, a pollution prevention and recycling project was completed achieving engineering, production process, and management changes. AZOVSTAL is now reproducing the design on a second production line using its own investment funds.

- II. USAID supported 18 demonstration projects conducted by the World Environment Centre at 10 enterprises in both regions. The project has two major components: 1- Identifies low-cost/no-cost approaches to waste minimization management, and 2- Expands the program through training the trainer approaches to as many enterprises as possible. These projects brought Ukraine closer to compliance with the waste management requirements for Basel Convention and the international market. The projects also improved Ukraine's capacity to protect public health from environmental releases, and the competitiveness of Ukraine's industrial base in the world market.
- III. Development of Regional Industrial Waste Management Strategy for Kharkiv Oblast: It included strategy development, industrial waste inventory development, development of data collection, and management system recommendations. Provision was made for the training in the form of six workshops. Preliminary designs were prepared for centralised facilities for industrial waste management.
- IV. The Ministry of Environment Protection and the Danish Ministry of Environment and Energy initiated the "Cleaner Technology in Machine Building Industry in Ukraine". The main goal of the project was to build capacity in the implementation of the CT concept in the machine building industry – one of the main polluting industries in Ukraine. The project included other activities as described as follow:
 - Screening of machine building enterprises for further implementation of no-, low-, and high-cost demonstration projects.
 - Training of local experts in the CT concept. Also training of local enterprise managers in the implementation of more efficient production methods.
 - Support local demonstration projects at enterprises where new and cleaner technologies were implemented.
 - Establish a CT support centre in Ukraine to facilitate the future activities and dissemination of CTs to other enterprises and industrial sectors.

The Cleaner Technologies Centre of Ukraine and Ukrainian industries are both involved in financing these activities in addition to the funds coming from grants.

2.7 Existing capacity and capability to further disseminate and implement the MEA's

Many institutions in Ukraine are active in the implementation of the Basel Convention. The following institutions play a focal role:

- I. The National Centre for Hazardous Waste Management was established in 1997 by Resolution of the Ukrainian Cabinet of Ministers in order to develop and implement technical and technological measures in the field of the hazardous wastes management at all stages of the lifetime cycle. The Centre is a division of the Ukrainian Ministry of Environment and Natural Resources. The main activities of the Centre are the following:
- Scientific and methodological follow up of the State programmes. Follow up on the fulfilment of Ukraine to its obligations in the frames of international conventions and agreements relevant to the hazardous wastes (HW) and hazardous chemicals (HC) management.
 - Co-ordination of the activities related to the development of the legislative and regulatory documents, and the creation of the information database for HW HC management.
 - Development of the methodology and establishment of the expert groups for environmental expertise in the field of hazardous wastes and chemicals management.
 - Development of the standard organisational, economical and technological schemes for hazardous wastes management in the frames of the National and International pilot programmes.
 - Performance of routine co-ordination functions for implementation of the National wide programme for the hazardous wastes management. Also, encourage leading experts of the Ukrainian Academy of Science and R&D institutes to get evolved in the program activities.
- II. The Ukrainian Scientific Research Institute of Ecological Problems (USRIEP) was established in Kharkiv in 1971. Key areas of the USRIEP's research activities that are related to environment protection, sustainable use of natural resources, and environmental safety, are listed below:
- Formulation of the concept of the state environmental policy with the objective to maintain the ecological equilibrium, ensure the environmental (and radiation) safety, improve the ecological state of natural environment and its components.
 - Establishment/strengthening of the legal, regulatory, economic and institutional framework of environmental management.
 - Providing a scientific rational for the control and management of water resources.
 - Strengthening the capacity of environmental monitoring through the provision of scientific, methodological, metrological, technical, informational, legal and institutional support.
 - Preparing the environmental action programmes, draft regulations/standards, integrated nature protection measures, environmental impact assessment (EIA) document; and providing a scientific framework for the environmental due diligence review and environmental auditing;
 - Developing environmentally sound sanitation technologies and schemes;
 - Preparing the industrial waste management strategies and plans;
 - Examining the state of air basin, and planning the actions on its protection;

- Providing a scientifically sound rationale for the development of protected areas and natural reserve networks;
- Ensuring the conservation of biological diversity;
- Providing the scientific and methodological support to the relevant regulatory authorities in the field of environment protection/management and natural resource management;
- Drafting the legislation and regulations to provide a framework for the sustainable development planning on a regional basis;
- Supporting the regional capacity for environmental management.
- Provide support within the activities of the industrial waste management centre.
- Provide support within the activities of the inter-departmental environmental centre.

2.8 Factors hampering proper implementation

Many factors are hampering proper implementation of the Basel Convention. Among these factors, the following are the most important:

- Low level of awareness and the absence of environmental culture in both wastes and hazardous waste management, in particular, among the industry and the public.
- Low level of funding of waste recycling and disposal due to the fact that the implementation of the Basel Convention is still in a transition period.
- Lack of efficient monitoring of industrial enterprises (inadequate number of environmental inspectors and) and lack of monitoring-analyzing equipment.
- Worn out and outdated production equipment and technologies.

2.9 Additional needs

The obstacles to the national implementation and compliance with the Basel Convention seem to be the following:

- Lack of awareness of the implementing authorities about the obligations arising under the BC.
- Lack of technical, administrative and financial capacity.
- Lack of coordination among relevant national authorities.
- Insufficient capacity building for the personals (for example, training).
- Insufficient budget allocations, changes in economic circumstances or unforeseen costs of implementation.

Annexe 2 – India country status report

ACME Global Status Report

- Annex 2 -

**Overview of the Implementation
of MEAs and CP in India
(India country status report)**

TABLE OF CONTENTS

1	Kyoto Protocol	3
1.1	Status of political acceptance	3
1.2	Legal / Administrative Frame Work	3
1.3	National Initiatives	4
1.4	International Collaboration.....	5
1.5	Recent Developments	7
1.6	Issues and concerns related to project preparation and approval.....	9
2	Basel Convention.....	11
2.1	Status of political acceptance	11
2.2	Legal and administrative Framework	11
2.3	National Initiatives	14
2.4	Example of Government Enforcement of Cleaner Production.....	15
3	Stockholm Convention.....	17
3.1	Status of political acceptance	17
3.2	Legal / administrative framework.....	18
3.3	National initiatives	20
3.4	National institutions and Capacity Building	22
3.5	Issues and concerns	22

1 Kyoto Protocol

1.1 Status of political acceptance

UNFCCC

- India signed UNFCCC on June 10, 1992
- Ratified the Convention on November 1, 1993

Kyoto Protocol

- Signed the protocol in November 1997
- Ratified in August 2002
- Set up designated National authority for CDM projects in December 2003
- The protocol came into force Feb 16, 2005 with Russia ratifying it.

1. The purpose of the clean development mechanism (CDM) is defined in Article 12 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change. The CDM has a two-fold purpose: (a) to assist developing country Parties in achieving sustainable development, thereby contributing to the ultimate objective of the Convention, and (b) to assist developed country Parties in achieving compliance with part of their quantified emission limitation and reduction commitments under Article 3. Each CDM project activity should meet the above two-fold purpose.
2. India, being non-Annexe-I country, does not have any emissions reduction obligation under the protocol. India is a signatory to the Kyoto Protocol to reduce greenhouse gas emissions worldwide. However, been a developing nation, unlike the industrialized nations it is not required to contribute to the effort. Consequently, the major focus of the country with regards to the Kyoto Protocol is CDM, or Clean Development Mechanism. When implemented in developing countries, CDM projects make the reduction in carbon production a commodity. Nations can sell the rights to emit carbon dioxide by adopting cleaner and eco-friendly technologies.
3. Currently, there is no political discontent over India's status under the Kyoto Protocol. It is widely anticipated that India will be a force to consider within carbon trading market in the near future.

1.2 Legal / Administrative Frame Work

1. India has demonstrated its participation in CDM by setting-up the DNA (Designated National Authority) known as the NCA (National CDM Authority) and

- by according the host country approvals. Also recently, India completed the World Bank's National Strategy Study for CDM implementation in India.
2. The DNA consists of the following entities:
 - Chairperson: Secretary, MoEF
 - Members or nominee of:
 - Foreign Secretary
 - Finance Secretary
 - Secretary, Industrial Policy and Promotion
 - Secretary, Ministry of Non-Conventional Energy Sources
 - Secretary, Ministry of Power
 - Secretary, Planning Commission
 - Joint Secretary (Climate Change), MOEF
 - Member Secretary: Director (Climate Change), MOEF
 3. The NCA endeavours to provide approval for the qualifying projects within 60 days of receiving the application. To guide the stakeholders in developing CDM projects, the MoEF has announced interim CDM project approval criteria (<http://envfor.nic.in/cc/cdm/criteria.htm>). So far the NCA has provided host country approvals for 78 projects (as on April 30, 2005). The government has played a key role in getting permission for unilateral projects; i.e., projects where a person, a group of persons or industry units embark on a project that can qualify for CDM. Once cleared by the host country and CDM Executive Board, the project can accumulate carbon credits for sale in the trading market. Almost 90 per cent of Indian projects are unilateral ones.

1.3 National Initiatives

1. Some of the activities undertaken in India on CDM in the last six months ending March 2005 include: a creation of an association for Indian project promoters, completion of CDM NSS (National Strategy Study)-India study, host of capacity building workshops, registration of the first Indian CDM project at the CDM EB (Executive Board). As on April 30, 2005, about 78 diverse CDM projects have received the host country approval. These projects include: using biomass to generate power electricity, generate electricity from sugar cane processing, converting municipal solid waste to energy, energy-efficient processing of fuel-intensive industries such as steel, cement, aluminium, etc.
2. India does not have any currently set target as far as Kyoto is concerned.
3. The large number of CDM proposals that has come up in India in a short span of six months is an indication on how industry and community organizations seize the opportunity. India has by far the highest number of proposals pending before the CDM EB. The fact that most of these are unilateral projects (self-financed

- and has no tie-up with an annexe-I country for selling carbon credits) shows the willingness of the Indian industry and community organizations to undertake risk.
4. The Government of India prepared a mandatory national communication document to UNFCCC (www.natcomindia.org). The document submitted last year elaborately covers emission levels of GHGS from India from all possible sources. The document contains authentic Indian emissions data.
 5. Central and state governments have assumed the role of facilitator. Some initiatives undertaken include the establishment of “**state clean development mechanism cells**” in India. The few states in India that took the lead to establish these state nodal cells for the promotion of CDM are: Andhra Pradesh, Madhya Pradesh, and West Bengal. It is anticipated that Karnataka, Maharashtra, and Tamil Nadu will soon establish such cells.
 - CDM Cell in Andhra Pradesh: The Government of Andhra Pradesh has recognized EPTRI (Environment Protection Training and Research Institute) as the nodal agency for CDM. The EPTRI is involved in the capacity building of industries, government officials, and consultants on CDM so that they can avail the benefits of carbon trading under the Kyoto Protocol.
 - CDM Cell in Madhya Pradesh: A CDM Cell has been set up at MPPCB (Madhya Pradesh Pollution Control Board), Bhopal. The MPPCB is closely dealing with several industries regarding environmental degradation, and thus can facilitate promotion of CDM in the state by sensitizing industries. The member secretary will coordinate the CDM Cell. In addition, a Steering Committee at the state level has also been constituted. The Cell will act in coordination with the Steering Committee, Government of Madhya Pradesh, and the Ministry of Environment and Forests at the Indian Government.
 - CDM Cell in West Bengal: The West Bengal Renewable Energy Development Agency, the nodal agency for promoting renewable energy and energy efficiency projects in the state, has recently been designated as the nodal agency for promoting CDM in the state.
 6. MOEF is working closely with international organizations on capacity building. United Nations Development Programme (UNDP), Asian Development Bank (ADB), and GTZ, German technical cooperation, support these programmes.

1.4 International Collaboration

- **The German Agency for Technical Cooperation (GTZ)**

The Indo German Energy Programme (Bureau of Energy Efficiency, Ministry of Power, Government of India) is implementing "A CDM - Capacity building

Programme" in partnership with Designated National Authority (Ministry of Environment and Forests, Government of India). The programme is funded by the German Ministry of Economic Cooperation and Development through IGEN, GTZ, for a period of three years to help reduce transaction cost in early market development process. The programme objective is to foster high quality CDM projects that will successfully complete the project cycle and provide experience through 'learning by doing'. These projects should be widely replicable. The aim of the project is capacity building and support to public and private sector institutions for preparation and implantation of internationally acceptable projects under the Clean Development Mechanism (CDM). GTZ support also includes helping the Indian DNA to prepare and launch a website.

- **The Asian Development Bank (ADB)**

The Asian Development Bank (ADB) supports climate change initiatives across its member developing countries in Asia and the Pacific through its Renewable Energy, Energy Efficiency and Climate Change (REACH) Programme. The Programme is supported by the trust funds from the Governments of the Netherlands, Denmark and Canada, and through the CDM Facility established in 2003. The Canadian Cooperation Fund on Climate Change under the REACH programme funded an 18-month Technical Assistance (TA) project in India (US\$ 700,000). The implementation of this TA is expected to start in June 2005. The main aspects of the ADB TA project include:

1. ADB would provide technical assistance for Capacity Building for Clean Development Mechanism (CDM) in India. While adopting a learning-by-doing approach, this TA project will target CDM opportunities available at selected urban local bodies, municipalities and rural sectors. It will mainstream CDM opportunities in the domestic financial sector and help structure a dedicated fund for facilitating widespread implementation of CDM projects in India.
2. The project would be implemented in close cooperation with the Ministry of Environment and Forests. It will address the capacity building needs of various stakeholders to strengthen India's position as a key player in the rapidly evolving international carbon markets.
3. The Project will provide broad-based institutional development, technical, and training support. The project shall build capacity of various stakeholders including urban local bodies in selected States for assessing, evaluating and developing potential CDM projects and project design documents (PDDs). It shall also develop a limited number of best practice CDM methodologies and PDDs, and formulate bundling mechanisms and financial structuring options. These activities has to be done in close cooperation with suitable banks and local bodies, in selected small-scale CDM sectors such as rural energy supply and SME industry clusters. These small-scale demonstration projects will form the base for the preparation of an operational toolkit/handbook. Other objectives of the project include targeted training to domestic financial

and insurance sector in the area of appraising and structuring CDM projects; and the development of a detailed feasibility design of a dedicated fund for facilitating widespread implementation of CDM activities in the country.

- **The United Nations Development Programme (UNDP)**

UNDP has been working closely with the Government of India in various strategic areas of development interventions. As one of the implementing agencies of the GEF, UNDP is contributing towards resource mobilization for addressing global environment issues. Clean Development Mechanism (CDM) is an important and innovative international financial cooperation mechanism that can play a significant role in mitigating climate change and promoting sustainable development in the long run. UNDP primarily seeks to contribute to an effort to mobilize and leverage additional CDM resources for an enhanced contribution to rural development and poverty alleviation.

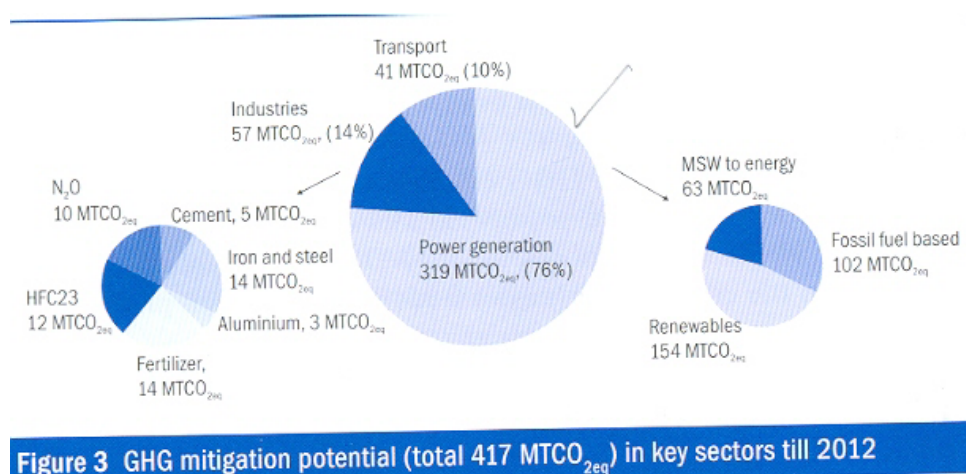
Five state agencies namely, 1- Punjab Energy Development Agency (PEDA), 2- Maharashtra Energy Development Agency (MEDA), 3- Rajasthan Energy Development Agency (REDA), 4- Environment Protection, Training & Research Institute (EPTRI), and 5- Environment Management & Policy Research Institute (EMPRI) have been identified with the Ministry of Environment & Forests for capacity building exercise. These agencies would each develop 2-3 Project Concept Notes and Project Design Documents with hands-on approach. If the project is successful, further agencies may be identified for capacity building in the second phase.

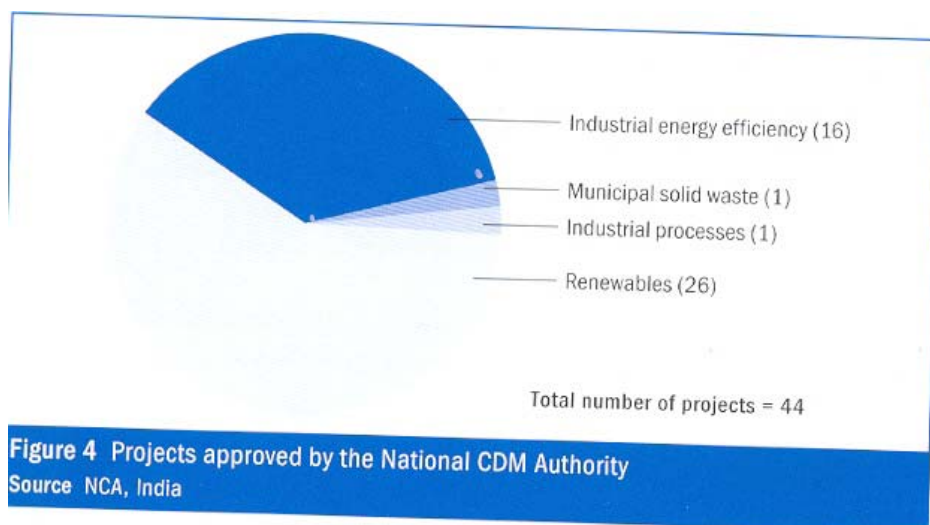
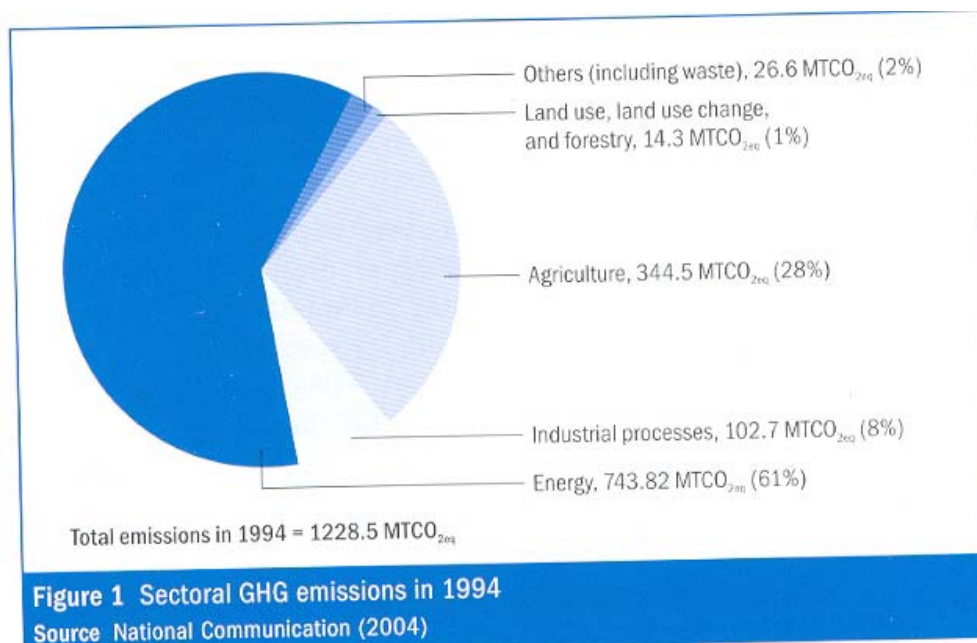
1.5 Recent Developments

1. The CDM Executive Board has approved simplified modalities for small-scale CDM projects. Further baseline and monitoring methodologies are in the process of being reviewed and approved by a Meth (methodology) Panel. The Meth Panel has developed and proposed consolidated methodologies and comprehensive additional tools to streamline the project approval process. As by 1 February 2005, 19 baseline and monitoring methodologies have been approved in the following sectors.
 - a. Energy generation and demand
 - b. Manufacturing industries
 - c. Fugitive emissions from fuels
 - d. Fugitive emissions from halocarbons
 - e. Waste handling and disposal
 - f. Agriculture
2. It is estimated that around 150 CDM project have been designed in India. Scores of project ideas are being discussed as potential CDM projects in various sectors now in India. CDM project development in India is facilitated largely by consultants and funded by the private sector itself. Some projects have also been

developed with the support of various donors for CDM capacity-building programmes in India or through CDM tenders. These donors include: Canada, Germany, Japan, United Kingdom, The World Bank, UNDP [United Nations Development Programme] India, the European Commission, etc. A number of financial institutions in India are currently operating a carbon funds. For instance, IDFC (Infrastructure Development Finance Corporation) is operating on behalf of the Prototype Carbon Fund. On the other hand, RaboBank India is operating for the Government of Netherlands. These financial institutions have recently included carbon revenues in their financial appraisals. Three DOEs (DNV, TUV SUD, and DGS) are represented in India.

- The current situation is described by the statistics illustrated in the figures below. The figures include information about the GHG mitigation potentials in key sectors till 2012, the sectoral GHG emissions in 1994, and the projects approved by the National CDM Authority.





1.6 Issues and concerns related to project preparation and approval

1. All the steps in the project cycle have associated costs, which contribute to the aggregation of transaction costs. In some cases, given the prevailing prices of CERs, these costs may not be offset by the CDM revenues. This may dampen the supply of projects. IDFC's experience reveals that the transaction costs today

- range between 65.000 and 250.000 UDD in India, and at a price of 5 UDS per CER, a threshold of 4.000 CERs need to be generated per year to break even.
2. Out of nineteen methodologies submitted from India, only two have been approved. This low success rate reflects the level of understanding and the quality of PDDs being prepared. It also highlights the need for improvement, and the scope of improvement in skills of consultants.
 3. Access to relevant and authentic data is the most crucial factor in developing a successful PDD. Despite that PDDs are prepared under a national strategy formulation, the access, availability, and authenticity of data were limited and inhibited the timely preparation of PDDs developed under the NSS.
 4. Limiting the bundling capacity of projects under SSC prohibits bundling a large number of SSC project. The limits specified under SSC M&P are: 15 MW [megawatt], 15 GWh [gigawatthour] or 15 thousand tones. This may result in several bundled projects of similar type and nature at one location. Such limitation will increase the transaction cost and is less attractive for the buyers. Therefore, it may be worth re-examining the upper limit for bundled SSC projects.

2 Basel Convention

2.1 Status of political acceptance

A. History:

- India signed the Basel Convention on March, 15 1990
- India Ratified it on March 24, 1992
- The convention came into force in 1992

B. In the late 1980s, a tightening of environmental regulations in industrialized countries led to a dramatic rise in the cost of hazardous waste disposal. Searching for cheaper ways to get rid of the wastes, “toxic traders” began shipping hazardous waste to developing countries and to Eastern Europe. When this activity was revealed, international outrage led to the drafting and adoption of the Basel Convention. The Basel Convention deals with the control of transboundary movement of hazardous wastes, particularly from industrialized countries to developing countries. Though the Basel Convention succeeded in limited hazardous waste exports, its effectiveness in protecting the environment through waste minimization remains low. Domestic and industrial waste production worldwide continues to rise in both absolute and per capital terms. Some projections expect waste production to increase five folds by 2025. Generation of waste is steeply growing both in newly industrialized and developing countries.

C. A central goal of the Basel Convention is “Environmentally Sound Management” (ESM). ESM aims to protect human health and the environment by minimizing hazardous waste production whenever possible. ESM addresses the issue of minimizing hazardous waste production through an “integrated life-cycle approach”. The “integrated life-cycle approach involves strong control over the whole process of hazardous waste management: generation, storage, transport, treatment, reuse, recycling, recovery and final disposal. Many companies have already demonstrated that “cleaner production” approach, which eliminate or reduce hazardous outputs, can be both economically and environmentally efficient. The United Nations Environment Programme’s (UNEP) Division on Technology, Industry and Economics works to identify and disseminate “best practices” for cleaner production.

D. There is a general censes in India, both at the political and bureaucratic level that transboundary imports of hazardous waste materials should be controled. The death of 12 people due to the explosion of imported scrap materials increased the awareness of the danger of hazardeous wastes.

2.2 Legal and administrative Framework

A. The Union Ministry of Environment and Forests is the nodal agency dealing with the Basel Convention. It drafts pilots, bills, orders and notifications related to the convention. Some of the Ministry’s sub-ordinate body, i.e., Central Pollution Control Board and state level pollution boards, are responsible for the monitoring.

Most of the action points discussed in the Basel Convention have already been adopted and harmonized with the country laws.

- B. Hazardous waste management rules existed in India since as early as 1989. These rules have been amended a number of times to make them in agreement with the Basel Convention.
- C. India has banned import of 18-19 class of compounds that appear in Schedule 8 of the convention. The import of Lead acid from battery wastes is also banned. The import of non-metallic wastes containing arsenic and lead beyond 0.1 per cent has stringent conditions and is not allowed under Open General License of import. The import of waste and used oil is also prohibited.
- D. At the beginning of the application of the convention there were widespread protests from importers of chlor-alkali and lead batteries against the banning of the import of these materials. Now this objection has subsided and industry is more or less in agreement with the regulation. Another factor is the interest that the Supreme Court, the highest judicial body in the country, has shown in hazardous waste management. In its 2003 ruling on public interest litigation, the court directed the government to meet certain targets. Some of these targets directly or indirectly deal with monitoring and controlling of hazardous waste import into the country. The court also appointed a high-level committee of experts to monitor the actions taken by the government and report back to the court. The committee has been visiting various states since then to check randomly on the initiatives taken by the State PCBs.
 - a) The government of India amended the existing 1989 Hazardous Waste Managing and Handling Act in 2003. [See Annex-1 for the complete details)
 - b) The state pollution control boards have been monitoring inflow and management of hazardous wastes into every state. The SPCBs register the firms dealing with recycling of hazardous wastes in each state, and periodically send a list of such firms to CPCB, which is under the Union Ministry of Environment and Forests.
 - c) Civil Society movements: Many NGO's are active in the monitoring of the inflow of hazardous wastes that fall under the Basel Convention into the country. The New Delhi-based Toxics Link is one of the most active of these NGOs. Toxics Link also monitors the activities of the firms that recycle or deal with hazardous wastes in the country. From time to time, it publishes publications or reports on its Web site www.toxicslink.org .
 - i. A recent example of a report by Toxics Link is based on a survey published by the British Environment Agency: "Britain's Environment Agency Confirms Huge E-waste Outflow to India". The report is available at: <http://toxicslink.org/art-view.php?id=75>.

A code of the report says: “ E-waste is a hazardous waste; as per the Basel Convention as it contains several toxics like heavy metals, PVC plastics, brominated flame-retardants, etc, which are a hazard to environment and human health”.

- ii. Another report from Toxics Links deals with lead acid batteries. The report states the following: lead acid batteries are a by-product of the automobile industry and those batteries are recycled for lead all over the world. In India, lead acid batteries recycling are not an organized industrial process, and are generally carried out on a backward level. This recycling results in massive lead pollution and has a huge impact on the environment and health. Lead is a highly toxic heavy metal that occurs naturally in the environment and has many industrial uses. However, even small amounts of lead can be hazardous to human health. Short-term exposure to high levels of lead can cause vomiting, diarrhoea, convulsions, coma or even death. Even small amounts of lead can be harmful, especially to infants, young children and pregnant women. In the developed countries recycling of lead acid batteries according to the norm is a costlier operation as a consequence a large number of batteries are dumped or recycled in developing countries such as India. The battery Rules, to improve the battery collection and recycling system, were published in 2000. However a study done by Toxics Link in Delhi showed a depressing picture of lead acid battery recycling in the capital. Toxics Link is also planning another study on the ground situation of battery disposal after the notification of the new Rules. This study will focus also on the responsibility of battery producers to arrange collection of used batteries and recycle the product through authorised recyclers. Toxics Link’s presentation gave an update on battery laws with ground perspectives related to lead acid batteries rules, that is, The Batteries (Management and Handling) Rules, 2001. The Rules apply to every manufacturer, importer, re-conditioner, assembler, dealer, recycler, auctioneer, consumer and bulk consumer involved in the manufacture, processing, sale, purchase and use of lead acid batteries or components of such batteries. They are aimed at the safe management of the hazardous effects of lead and control of pollution.
- iii. According to Toxics Link:
 1. Only 11 states filed compliance reports.
 2. The level of collection of used-batteries by big manufacturers still does not meet the law requirements.
 3. No information is available on the compliance level in the public domain.
 4. Large amounts of batteries are ending up with unregistered recyclers.
 5. Compliance level among dealers is very low.
 6. Visibility of the Rules is still very low.

2.3 National Initiatives

- A. India has taken numerous steps in the direction of scientific management of hazardous wastes. It has modified its domestic legislations for the handling and disposal of hazardous wastes way back in 1989, the same year when the World community adopted the Basel Convention. Since then, India has further amended its strategies and national programmes to make them more allied with the Basel Convention. In the past decade and a half, India has taken specific actions to further tighten the Rules for management of wastes, fix institutional responsibilities, and enhance resources for waste disposal. In addition, India has taken actions to lay down standards for treating effluents, and guidelines for construction and operation of secured landfills. Some of the major programmes include:
- Enactment of specific legislations to effectively deal with special categories of Hazardous Wastes viz. Bio-Medical Wastes and Lead Acid battery wastes.
 - Establishment of state-of-the-art Common Treatment, Storage and Disposal facilities for industrial hazardous wastes and biomedical wastes under the public-private partnership initiatives. Already 5 Hazardous Wastes Treatment, Storage and Disposal facilities and more than 70 Bio Medical Facilities have been set up in different States.
 - Harmonization of Import/Export policies for hazardous wastes with the principles of Basel Convention.
 - Synchronization of Domestic Foreign Trade and Customs Legislations with Hazardous Wastes Rules. In addition, capacity building at major ports and Customs Laboratories to prevent illegal import and dumping of Hazardous wastes in the country. For instance, for the ease of monitoring the inflow of hazardous waste into the country, an international coding system is used: a hazardous material will have the same code as it has in any other country that adopts the Basel Convention.
 - Formulation of comprehensive technical guidelines to facilitate the industries, particularly small- scale industries, to deal with hazardous waste management.
- B. India has identified priority programme activities for preventing, minimizing, recycling, recovering and disposing of hazardous and other wastes in an environmentally sound manner and for promoting capacity building and adoption of cleaner technologies. There are still significant challenges with regard to technology upgrading. A major challenge is the resource constraint faced by the small and medium scale industries with regards to both waste minimization and treatment technologies.
- C. The government of India maintains a list of industrial units that deal with hazardous wastes, including those, which import non-ferrous material wastes for

recycling. The list, including some details about these firms, is available on the MoEF website. Similarly, Rule 5 of the Batteries (Management and Handling) Rules, notified by the Ministry of Environment and Forests in May 2001, stipulates that all the importers of new lead batteries must register with the Ministry of Environment and Forests by submitting details in a form prescribed in the Rules. Rule 6 stipulates that custom clearance of imported lead acid batteries shall be contingent upon, inter-alia, the one time registration with the Ministry of Environment and Forests. Accordingly, applications are being received from importers of new lead acid batteries. Based on the examination of the applications, one time registration is being granted to such importers. As on March 1, 2005, there are about 64 firms have registered with MoEF. Similarly, MoEF maintains a list of other non-ferrous metal waste re-processors. There are about 81 firms registered as non-ferrous recyclers in the country. In addition, there are 35 waste oil/used oil-recycling firms that have received permission from the MoEF.

- D. The situation improved considerably due to the Supreme Court closely monitoring of hazardous waste management.. An empowered monitoring committee appointed by the apex Court frequently visits various states, get firsthand information, and submit reports to the Court. The committee, which was set up immediately after the October 2003 Supreme Court Order on hazardous waste management in the country, has examined hazardous waste management preparedness of almost all Indian states.
- E. There is a slowly growing resistance from the local communities against dumping hazardous wastes in their vicinities as the awareness of the harmful effects of these wastes increases. This resistance is illustrated mainly by the NIMBY attitude, i.e. 'Not in My Backyard.'

2.4 Example of Government Enforcement of Cleaner Production

The regulation of the waste oil/used oil recycling is an example of the application of the cleaner production concept in India. Before the Indian government engagement to enforce cleaner production processes, most of the re-refining units in the small-scale sector in India used to adopt the acid-clay process to recycle used oil. This classical process used to be the basic method all over the world. It has the disadvantage of generating large quantities of hazardous and toxic acid sludge and clay contaminated with oil and heavy metals. Being a non-environment friendly method, the acid-clay process has been abandoned some years ago in most countries including the USA, the European Union countries, and other industrially advanced countries. The sludge resulting from this process contains a significant amount of oil and has fuel value. It is presently used in India as a fuel, e.g. in brick manufacturing units. The acid sludge is being burned in brick kilns that are not properly equipped with air pollution control devices. Though this is a reuse of a resource, it generates hazardous gaseous emissions and creates environmental problems. To solve this issue, in 1997, the CPCB issued a direction to the SPCBs to disallow the acid-clay process. In 2000, the government amended its first decision and allowed the modified acid-clay process.

The Hazardous Waste (Management & Handling) Amendment Rules, 2003 details the technology and standards regarding re-refining and recycling. These rules states that:

- I. Re-refiners and recyclers shall use only environmentally sound technologies when recycling and re-refining non-ferrous metal wastes or used oil or waste oil. In case of used oil, re-refiners using acid clay process or modified acid clay process shall switch over within six months from the date of commencement of the Hazardous Waste (Management & Handling) Amendment Rules, 2003 to other environmentally sound technologies as under:
 - a. Vacuum distillation with clay treatment.
 - b. Vacuum distillation with hydro treating.
 - c. Thin film evaporation process; or
 - d. Any other technology approved by the Ministry of Environment & Forests
- II. The re-refiners and recyclers, registered with the Ministry of Environment and Forests or the Central Pollution Control Board in accordance with the procedure laid down in rule 19, shall file a compliance report of having adopted one of the technologies mentioned in sub-rule (1) within six months from the date of commencement of the Hazardous Wastes (Management and Handling) Amendment Rules, 2003.
- III. Notwithstanding anything contained in a certificate of registration granted to a recycler or re-refiner, such registration with the Ministry of Environment and Forests shall cease to be valid if he fails to comply with sub-rule (1).
- IV. The State Pollution Control Board or Committee shall inspect the re-refining and recycling units within three months of the expiry of the six months period referred to in sub-rule (1), and submit a compliance report to the Central Pollution Control Board which shall compile such information and furnish the same to the Ministry of Environment and Forests on a regular basis.
- V. The Ministry of Environment and Forests shall notify from time-to-time specifications and standards to be followed by recyclers and re-refiners.

3 Stockholm Convention

3.1 Status of political acceptance

A. Legal Status:

- India signed the treaty on 14 May 2002
- India hasn't ratified the treaty yet. is not However, the government of India has decided in principal to ratify the PoPs Treaty. A Cabinet note is ready. The ratification will happen once the Union Cabinet gives the nod (this is expected anytime now).
- The Convention came into force on May 17, 2004.

B. Current Situation:

- The convention focuses on reducing and eliminating the release of 12 of the most dangerous Persistent Organic Pollutants (POPs). Coined as the "Dirty Dozen" by the United Nations Environment Programme (UNEP), POPs include: eight pesticides (aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex, and toxaphene); two industrial chemicals (polychlorinated biphenyls (PCBs), and hexachlorobenzene); and two unintended by-products (furans and dioxins).
- Ratification is expected within a short time with the imminent approval of the Rs 1,25,000 crore Indian chemical industry. India is expected to avail the Article 25 (4) of the convention. This article gives discretionary powers to Parties with regard to future amendments to Annex A, B or C. This gives India a chance to "opt in" or "opt out" of any ban imposed on new chemicals.
- According to the Government of India, out of 12 POPS chemicals, six (aldrin, chlordane, endrin, heptachlor, toxaprene, hexachlorobenzene) are already banned in India. In addition, 2 of the 12 POPS (DDT and dieldrin) are under restricted use. Pesticide Mirex is not registered in India, and polychlorinated biphenyls are not produced in the country. Dioxins and Furans are unintended by-products.

Chemical	Status	Effective Date
Aldrin	Complete ban on manufacture, use, import and export	20 th September 1996
DDT	Banned for agricultural use, and restricted use in public health sector (10,000 MT per annum)	26 th may 1989

Dieldrin	<p>a) Use restricted to locust control in desert areas under the direction of Plant Protection Adviser.</p> <p>b) Complete ban on manufacture, import and export.</p> <ul style="list-style-type: none"> • Marketing and use permitted for two years from the date of ban on manufacture, or date of expiry, whichever is earlier. 	<p>a) 15th May 1990</p> <p>b) 17th July 2001</p>
Endrin	a) Complete ban on manufacture, use, import and export	15th May 1990
Chlordane	a) Complete ban on manufacture, use, import and export	20th September 1996
Mirex	Never registered	
Toxaphene	Complete ban on manufacture, use, import and export	25th July 1989
Heptachlor	Complete ban on manufacture, use, import and export	20th September 1996
Hexachlorobenzene	Complete ban on manufacture, use, import and export	

3.2 Legal / administrative framework

- A. The Union Ministry of Environment and Forests is the nodal agency for the programme. The Ministry's declares that out of 12 POPs chemicals, six (aldrin, chlordane, endrin, heptachlor, toxaprene, hexachlorobenzene) are already banned in India. In addition, 2 of the 12 POPs (DDT and dieldrin) are under restricted use. Pesticide Mirex is not registered in India, and polychlorinated biphenyls are not produced in the country. Dioxins and Furans are unintended by-products..
- B. The ministry has assigned the Lucknow-based Industrial Toxicological Research Institute (ITRC) to conduct a preliminary assessment to identify the requirements for developing a National Implementation Plan in India. ITRC has already submitted a draft plan to the Ministry. Once the Union Cabinet gives the green light to ratify the convention, the Ministry intends to start up a detailed study to estimate stockpiles of different pesticides, banned or suspected, in the country. The project might be supported by GEF/UNIDO. This study is expected to be the forerunner of the National Implementation Plan, which may be implemented much later.
- C. Status of POPs in India: Out of the 12 POPs, six have been banned in India. Thus, India has already taken germane actions in accordance with Stockholm Convention. The progress in banning these chemicals is provided in the table that follows.

PCBs:**A. Regulations and Enforcements.**

- PCBs have been banned in India since 1967.
- According to MoEF officials, BHEL (the only firm that manufactured transformers which contain PCBs) had submitted the statement to the government declaring that it had stopped PCB's production already in 1963.
- In 1967, the Ministry of Petroleum and Natural Gas passed a law banning PCBs in transformers capacitors. The government reports that PCBs have not been used in the country since 1967.
- The Hazardous Wastes (Managing and Handling) Amendments Rules, 2000, list PCBs as a Class A waste substance and specify for it a limit on concentration level of 50 mg/kg. The first activity of the NIP is to identify such potential sources of PCB contamination.

B. PCBs Potential Presence in India.

- MOEF states that no company in India has ever produced paints containing PCBs, paints being recognised as another potential class of products that may contain PCBs.
- There is low chances that PCB's are disseminated by the ship demolishing industry the when ships are scrapped. As the use of PCBs in paint was banned world wide more than a decade ago, demolished ships are not expected to have PCB's considering that a ship receives a fresh coat of paint every two years. However in a study on ship demolishing (Hess R Rushworth, D Hynes & Peters J E: *Disposal options for ships* (www.rand.org/publications/MR/MR1377/MR1377.ch4.pdf)), the authors estimated that a typical merchant ship to be dismantled for scrap contains 250 kgs to 800 kgs of PCBs, found principally in the paint, and the machinery.
- A 1996 World Bank study, Management of PCBs – India, estimated that approximately 2,000 to 4,000 tonnes of PCBs existed in India. The amount of power PCB-containing transformer oil was estimated to be in the range of 3,000 to 5,000 tonnes, with the amount of PCBs in capacitors estimated to be 1,000 tonnes. The authors assumed that there is an equivalent amount of PCBs outside the power sector, including hydraulic systems of heavy machinery and paints. The steel industry is a likely source of PCBs, particularly the plants using Russian technology.
- In World Bank's opinion, PCBs are not considered a priority in India. The general feeling is that PCBs are not a problem because they have been banned since 1967, are not produced in India, and their import is no longer permitted. Yet a number of outstanding issues remain to be addressed: 1) awareness raising, 2) analytical facilities, 3) inventories, 4) storage and disposal technologies and 5) PCB management plans in the power sector and some other sectors.

DDT:

- Only one public sector firm HIL is producing DDT in the country.
- The total volume of DDT produced per year is 4500 MT. MOEF officials feel that, it is very small quantity considering the size of the country, and that India still has time till 2025 to completely phase out the use of DDT.
- It appears that there are no effective alternatives readily available to replace DDT use. As an example, South Africa had to resume using DDT after it banned its use because the alternatives had proved ineffective. When an efficient alternative can be identified, the government would take a new look at the DDT policy.

Dioxins:

- Dioxins are by-products.
- NIPs main aim is to monitor Dioxins production along with looking for PCB stockpiles. There are 8 to 10 laboratories in the country, which have the capacity to monitor and measure PCB/dioxin production. These labs include National Environmental Engineering Research Institute, Nagpur, National Chemical Laboratory, ITRC, Shriram Centre, Regional Research laboratory, Thiruvananthapuram, National Institute of Occupational Health, Ahmedabad, and etc.
- Currently, no data is available how much dioxins are produced in the country.
- India currently has limited capacity to measure or monitor dioxins and furans. In addition, its ability to monitor unintentionally produced PCBs is also limited. The CPCB is working very closely with the German technical aid agency GTZ to develop monitoring systems.
- India does not require reporting of dioxins or furans or dioxin-like PCBs release to the environment. Environmentalists agree that dioxins are being produced throughout India, but the magnitude of health and environmental levels and effects of dioxins and furans is unknown.
- According to ITRC, major sources of dioxins and furans in India are:
 - A. Combustion processes
 1. Waste incineration
 2. Open field/landfill burning
 3. Residential combustion
 4. Fossil fuel combustion
 5. Wood firing installations
 6. Thermal processes
 - B. Industrial processes:
 1. Thermal processes in metallurgical industry
 2. Pulp bleaching by chlorine
 3. Textile/leather dyeing (with chloranil)
 4. Smouldering of copper cables
 5. Additives in petrol and lubricants
 - C. Production of Specific chemicals
 1. 2,4,5-Trichlorophenol (TCP)
 2. Pentachlorophenol
 3. Chloranil
 4. Chlorinated aromatics
 5. Vinyl chloride

3.3 National initiatives

- A. According to MoEF officials, Indian chemical industry is well aware of the issues and cooperates sincerely with the government. MoEF is hopeful that once the convention is ratified, many industries will take up programmes to tackle the issue of dioxin/furan emissions. Industry organizations, such as Indian Chemical Manufacturer's Association (ICMA), and NGOs, such as Toxics Link and Greenpeace India, are participating in the discussion..

- B. The Rs 1,25,000 crore Indian chemical industry initially had a lot of reservations about India signing the convention. Although they have nothing against the existing list of POPs, they fear that slowly other chemicals will be added to the list and that this may hamper their operations. However, the government of India, which had several rounds of discussions with the industry, has assured them that India will then utilise Article 25 (4) of the convention, which gives discretionary powers to Parties with regard to future amendments to Annex A, B or C. This gives India a chance to “opt in” or “opt out” of any ban imposed on new chemicals. Out of 94 countries that have so far ratified the convention (until March 15 2005), only nine have opted for conditional ratification. These countries include Argentina, Canada and China. ICMA is a regular member of the India’s official delegation to the POPs Convention and participates actively in the discussions.
- C. Both Toxics Link and Greenpeace are quite outspoken regarding the fact that India has not ratified yet the convention. According to a Toxics Link publication, Status of POPs in South Asia, “There is very little awareness on the release of dioxins and furans in the region. Given the fact that the dioxin releasing industries in India use outdated technology with high inefficiencies, it is expected that the dioxin and furan releases will be considerable. The main shortcomings seem to be the lack of monitoring facilities and lack of knowledge of the nature of possible dioxin exposure.” Toxics Link acts as a pressure group and is also an invited NGO to the convention.
- D. The MoEF has been regularly interacting with chemical industry. The Central Pollution Control Board (CPCB) in joint cooperation with GTZ is working on monitoring systems for dioxin/furan for various industrial units. As part of preparing a draft proposal for NIP, in the 2004 calendar year, ITRC conducted as many as 10 workshops in different parts of the country to educate various stakeholders about POPs in general and the Stockholm convention in particular. Apart from industry, state government officials, representatives of farmers and health workers and researchers participated in these workshops. The broad objectives of these workshops included gathering information on infrastructure of government institutions, commerce and industry, public and private testing laboratories, research institutions, enforcement entities, public health institutes, NGOs and other associations relevant to the implementation of the Stockholm convention. More concrete actions are expected only after the ratification and NIP is adopted.
- E. Integrated pest management: The government of India has programmes to explore alternative pest control methods, including Integrated Pest Management (IPM), which promotes an environmentally sound and sustainable strategy of pest control. The concept was adopted in 1990, when subsidies on pesticides were stopped and money diverted to IPM. The National Centre for Integrated Pest Management (NCIPM) and agricultural universities carry out research and encourage alternative methods.
- F. Through IPM, farmers can learn how agricultural eco-systems function, including how pest populations change. Farmers learn to ecologically and economically manage pests, including how to physically remove and destroy pests, build up beneficial predators and diversify crops. The aim is to keep the balance between pests and their natural enemies, and to keep the spraying of

expensive and potentially damaging and dangerous pesticides to an absolute minimum. However, IPM has yet to gain wide application in India. Although the Indian government provides assistance to farmers during the transition period when IPM affects the crop yield and farmers' income, farmers are reluctant to adopt IPM. The reason is that IPM is a slow process and has an initial high cost of implementation.

3.4 National institutions and Capacity Building

India has a number of excellent chemical science laboratories. These laboratories are mainly operated by the public sector, have sophisticated facilities, and the capability of detecting and monitoring dioxins and furans. Dioxins and furans are both by-products categorized as POPs.. MoEF has particularly identified 10 laboratories in different parts of the country for this purpose. Central Pollution Control Board is already working with international organizations like GTZ for capacity building in monitoring dioxin emission from different industries such as paper and pulp, cement, iron and steel sintering process in the metallurgical industry, etc.

3.5 Issues and concerns

- A. As there are currently no norms regarding dioxin and furan emission control, it is not yet legally binding on industry to curb such emissions. However, things are expected to be different after India ratifies the POPs convention and the NIP is accepted.
- B. Currently, India does not have a dioxin or furan inventory. These two industrial POPs are unwanted by-products resulting from industrial and thermal processes. As a result, unlike intentionally produced substances, the ban is not an effective measure to address the problem of dioxin and furan releases. Cleaner Production can be a potential partial remedy. There are several provisions in the Convention that are related to the CP concept: safer alternatives, life cycle thinking, Best Available Technique, Best Environmental Practices, prevention-oriented national policies and plans.
- C. Two potential alternatives to the ban of dioxins and furans exist. The two alternatives are:
 1. Opt for conventional end-of-pipe. This requires considerable expenditure on abatement and monitoring equipment; or
 2. Focus efforts on preventative strategies and search for alternatives production processes that reduce and/or eliminate the dioxin/furans emissions. .
- D. Some valid observations from the 2002 World Bank-sponsored study [Status Report on Stockholm POPs in India, Resource Futures International, 2002] are listed as follow:
 - The illegal products are of questionable standard and efficacy, and often sold in unlabelled packets or boxes. Many small-scale industries produce pesticides; and thus the technical formulations and grade cannot always be determined. The poor labelling and lack of standardized production can lead

to incorrect application and overuse of banned substances, ignorance of the hazards involved, lack of safety considerations and improper use of equipment and protective clothing. The risk of acute pesticide poisoning following accidental or intentional overexposure is extremely high.

- The FAO has undertaken an inventory on stockpiles of pesticides in India. This study indicated that the total of obsolete, unwanted and/or banned stocks in India totals 3,346 tonnes (both POPS and non-POPs). The FAO reckons this figure is far lower than actual stockpiles. The inventory lists two known sites of BHC (980 and 700 kg) and one known site of DDT (150 kg). There is a number of organochlorine stockpiles listed, where the common name, commercial name, and formulation are unknown. Included in the inventory are 1,464,481 kg of organochlorine stocks (location, name, formulation unknown) declared by the Indian government at the UNEP-Chemicals workshop at Bangkok. The MP PCB indicated that it was approached by the state office of the National Anti-Malarial Programme (NAMP) to provide assistance in the disposal of stockpiles of an estimated 500 to 600 tonnes of DDT.
- There are no policies or technical guidelines in India regarding the disposal of stockpiles. However, an Experts Group constituted by the Ministry of Agriculture has recommended incineration in an appropriate manner with the help of emission control equipment. Those pesticides that cannot be disposed off through incineration may be disposed of in secure landfills. The CPCB and SPCBs are responsible for monitoring the disposal process, and the state departments of agriculture are responsible for developing programmes for disposing of stockpiles.
- The government has experienced problems with the disposal of banned pesticides, lacking of technology and know-how for proper disposal of stockpiles. To overcome these problems, the strategy of the government is to allow the use of the pesticide for two years from the day of notification of the ban. This strategy will allow the existing stocks to be used up, eliminating the need for disposal, as safe and effective disposal technologies are lacking in India. The banned pesticides will continue to be used on recommended crops; the state governments will monitor their usage. State governments are expected to develop action plans for disposal within one year of the Indian legislative ban, the period of destruction and disposal should not exceed three years.
- Similarly, abandoned factories and storage warehouses in India can contain banned POPs, and are sources of potential releases of POPs into the environment through seepage, vaporisation and leaching. As pesticides deteriorate, they form by-products that may be more toxic than the original substance. In addition to pesticides, waste sites often contain contaminated sprayers, empty pesticide containers, and polluted soil. FAO reports that in many cases the stockpiles have been abandoned and pesticide was left in the open or stored in corroding metal containers.
- The stockpiles of banned and date-expired POPs are considered hazardous waste. Their removal and destruction is expensive and requires technical expertise. The cost of disposal is estimated around US\$ 3 per kilogram or litre.

About the UNEP Division of Technology, Industry and Economics

The UNEP Division of Technology, Industry and Economics (DTIE) helps governments, local authorities and decision-makers in business and industry to develop and implement policies and practices focusing on sustainable development.

The Division works to promote:

- > sustainable consumption and production,
- > the efficient use of renewable energy,
- > adequate management of chemicals,
- > the integration of environmental costs in development policies.

The Office of the Director, located in Paris, coordinates activities through:

- > **The International Environmental Technology Centre** - IETC (Osaka, Shiga), which implements integrated waste, water and disaster management programmes, focusing in particular on Asia.
- > **Production and Consumption** (Paris), which promotes sustainable consumption and production patterns as a contribution to human development through global markets.
- > **Chemicals** (Geneva), which catalyzes global actions to bring about the sound management of chemicals and the improvement of chemical safety worldwide.
- > **Energy** (Paris), which fosters energy and transport policies for sustainable development and encourages investment in renewable energy and energy efficiency.
- > **OzonAction** (Paris), which supports the phase-out of ozone depleting substances in developing countries and countries with economies in transition to ensure implementation of the Montreal Protocol.
- > **Economics and Trade** (Geneva), which helps countries to integrate environmental considerations into economic and trade policies, and works with the finance sector to incorporate sustainable development policies.

*UNEP DTIE activities focus on raising awareness,
improving the transfer of knowledge and information,
fostering technological cooperation and partnerships, and
implementing international conventions and agreements.*

For more information,
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This project “Applying Cleaner Production to Multilateral Environmental Agreements” wants to contribute to leverage the implementation of MEAs through applying the Cleaner Production concept; focusing on three MEAs that are especially important to industry - the Kyoto Protocol to the UN Framework on Climate Change (UNFCCC), Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, and the Stockholm Convention on Persistent Organic Pollutants (POPs).

Despite existing national plans and programmes, institutional arrangements for implementing those three MEAs are not well developed. Stakeholders such as the industry and financial sector, have yet to be effectively involved.

To address these questions, this Global Status Report describes current approach and present implementation status of those MEAs. Insight is given in the potential application of a preventive environmental strategy, Cleaner Production, with best practices in national policies, legislation and industry. The report analyses the generic links between CP and MEAs and generates conclusions and recommendations on how to further enhance the effectiveness of MEA-implementation by integrating preventive environmental strategies.

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ACME Global Status Report

- Annex 1 -

**Overview of the Implementation
of MEAs and CP in Ukraine
(Ukraine country status report)**

TABLE OF CONTENTS

1	United Nations Framework Convention on Climate Change (UNFCCC)	3
1.1	Status of political acceptance	3
1.2	Official action plans at the country and regional level	3
1.3	Priorities per country: regions and sectors	7
1.4	Stakeholders most active in the field	8
1.5	Disseminate of the information	8
1.6	Implementation of the UNFCCC s	9
1.7	Existing capacity and capability to further disseminate and implement the MEAs	9
1.8	Factors hampering proper implementation	9
1.9	Results achieved	10
1.10	Additional needs	10
2	Basel Convention	11
2.1	Status of political acceptance	11
2.2	Official action plans at the country and regional level	12
2.3	Priorities per country: regions and sectors	18
2.4	Stakeholders most active in the field	21
2.5	Dissemination of the information	22
2.6	Implementation of the Basel Convention	23
2.7	Existing capacity and capability to further disseminate and implement the MEA's	24
2.8	Factors hampering proper implementation	26
2.9	Additional needs	26

1 United Nations Framework Convention on Climate Change (UNFCCC)

1.1 Status of political acceptance

In June 1992, Ukraine signed the United Nations Framework Convention on Climate Change (UNFCCC). It ratified the Convention in October 1996, became an official Party to the UNFCCC in August 1997, and thus got listed in Annex I of the Convention.

The Kyoto protocol, agreed upon in 1997, establishes a binding GHG emission commitment among the Parties to this Convention. Ukraine joined the Kyoto Protocol on 15 March 1999, and ratified it in February 2004. In April 1999, Inter-Ministerial Commission on Climate Change was established by the Resolution of the Cabinet of Ministers of Ukraine.

Ukraine can generate significant revenues from the Kyoto Protocol by selling emission credits. The Industrial crisis in Ukraine in the nineties resulted in the reduction of the carbon dioxide emissions by about 60% between the years 1990 and 2000. Therefore, Ukraine is very interested in the implementation of both joint implementation (JI) and international emission trading (IET) flexible mechanisms.

The implementation of JI would cause a considerable inflow of direct investments in key sectors of the economy. It may also produce a number of additional benefits associated with the introduction of new energy-saving technologies, and the possibility for waste utilization in municipal services, agro-industrial production and other sectors of national economy.

Ukraine is a member of the Umbrella Group that includes also the US, Canada, Japan, Australia, New Zealand, Norway, and Russia. It signed the Memorandum of Intent and bilateral agreements on climate change mitigation with a number of other countries, including the United States and Canada.

The Ukrainian Government also cooperates with international agencies and institutions for development such as UNDP (United Nations Development Program), World Bank's IBRD (International Bank for Reconstruction and Development), and EBRD (European Bank for Reconstruction and Development).

Latest statements of the Ukrainian Cabinet of Ministers (March 2005) indicate that the Government is considering different potential projects and is attempting to encourage investments from the overseas.

1.2 Official action plans at the country and regional level

Little has been done in Ukraine to develop the appropriate institutional capacity to participate in international market-based flexibility mechanisms and to maximize revenues associated with JI and IET.

The institutional structure to deal with JI and IET is still not available. A number of existing institutions can play a decisive role in this context. These institutions include:

A. Ministry of Environmental Protection of Ukraine (MEP)

MEP is the primary institution responsible for all climate related issues, including those concerning the Framework Convention on Climate Change. It is the main coordinator of all Climate Change programs in Ukraine.

MEP formulates the emission control policy and its regional departments implement it. These departments work together with oblast (regional) administrations and report to them.

Main responsibilities of the MEP are:

- Environmental protection (policymaking, air pollution abatement).
- Environmental impact assessment of industrial activities and investments.
- Environmental monitoring and reporting.
- Initiation and financing of environmental protection activities.
- Nation wide promotion of R&D, education, and training.
- International cooperation (negotiating and signing agreements, exchanging data and expert opinions, participating in conferences and meetings).
- The affirmation that the Focal Point (i.e. Minister of the Environment and Natural Recourses) fulfils the requirements of the UNFCCC.

B. State Hydrometeorology Service

The State Hydrometeorology Service under the MEP is entrusted with the national emission inventory coordination. A national inventory system of adequate quality has to be in place for Ukraine to be eligible to participate in the flexible mechanisms under the Kyoto Protocol. The present functions of the State Hydrometeorology Service are to:

- Carry out National Air Pollution Inventory which focuses primary on harmful pollutants.
- Be responsible for the national GHG inventory according to the IPCC methodology using data from energy statistics.
- Collect data for the inventory of GHGs.
- Develop a new emission inventory system.

C. Inter-Ministerial Commission on Climate Change

To fulfil national commitments under the UNFCCC, the Inter-Ministerial Commission on Climate Change has the following functions:

- Arrange the development of the national strategy and the national action plan to fulfil Ukraine's commitments under the UN Framework Convention and the Kyoto Protocol.

- Coordinate activities of the ministries, central and local executive bodies, enterprises, institutions and organizations, for the implementation of the national action plan to fulfil Ukraine's commitments under the UN Framework Convention and the Kyoto Protocol.
- Produce proposals on the implementation of the Kyoto Protocol mechanisms.
- Arrange the preparation of national communications of execution of the commitments as per the UN Framework Convention.
- Arrange the preparation of a national inventory of anthropogenic emissions by sources and absorption by sinks of all greenhouse gases not controlled by the Montreal Protocol.
- Review the UN Framework Convention and Kyoto Protocol, including inputs from other governments, Global Environmental Facility, World Bank, and other international organizations, and use them as a basis for the preparation of relevant proposals.

Other ministries and institutions can also play some role in Ukraine's climate change policy. These ministries and institutions are presented as follow with their main tasks:

A. Ministry of Fuel and Energy (MFE)

- MFE is responsible for all important strategic issues regarding national energy production and consumption. These include large-scale heat and power production which are the main emitters of GHG's.
- MFE supplies long-term forecasts for the power sector, information on industrial energy use, and formulates the technological policy for the power sector.
- The Department for Energy Conservation (former State Committee for Energy Conservation) at MFE supports the activities in the field of energy conservation, energy efficiency and climate change.

B. Ukrainian Ministry of Economy and European Integration

The Ukrainian Ministry of Economy and European Integration is responsible of:

- Analysis and formation of State policy of economic and social development.
- Forecasts of economic and social development.
- Establishment of national priorities of economic development.
- Elaboration of coherent foreign trade policy.
- Economic and social cooperation with the European Union.

C. State Committee on Statistics of Ukraine

The State Committee on Statistics of Ukraine is responsible of:

- Collection of statistical data on social and economic development.
- Convergence of the Ukraine system of national accounts with the UN standard.
- Insurance of the reliability of the statistical information.

D. Ukrainian Ministry of Finance

The Ukrainian Ministry of Finance is responsible of

- Securing unified finance, budget and taxation policy directed to the implementation of State policy of economic and social development.
- Overseeing the administration of the national budget of Ukraine.
- Coordinating finance and taxation policy of other ministries.
- Securing concentration of financial resources on key directions of economic and social development.
- Elaborating strategy of internal and external borrowing.
- Potentially playing an active role in introducing GHG emission trading as a potential distributor of revenues from emission allowance sales.

E. Ministry of the Foreign Affairs of Ukraine

The contribution of the Ministry of the Foreign Affairs of Ukraine could be in:

- Coordination of multilateral and bilateral negotiations.
- Providing information for international contracts with possible governmental guarantees.

F. Ministry of Transport

The contribution of the Ministry of the Foreign Affairs of Ukraine could be in:

- Formulating governmental policies for the sector.
- Providing the Cabinet with forecasts of sector development
- Formulating policies of technological change in the sector.
- Formulating the emission control policy in the transportation sector, and possibly supplying a long-term forecast of GHG emission from mobile sources.

Apart from the government sector, private companies are expected to take part in the GHG market, most notably consulting firms, banks, insurance firms, energy and environmental service and audit companies.

Building institutional capacity will entail certain budgetary implications, such as direct expenditures required for the establishment of Kyoto Protocol institutions in the country,

and the resources required for establishing relevant policies and ensuring appropriate compliance with the international rules. Moreover, the budgetary constraints will substantially differ for Track 1 and Track 2 eligibility.

Despite the numerous existing institutions potentially dealing with climate change issues, Ukraine should establish a central JI/IET office.

The European Commission's TACIS programme, providing technical assistance for newly independent states, has appointed a team led by ICF Consulting to provide advisory services to the Governments of Belarus and Ukraine over 2004-2006 to support the countries' implementation of international climate change commitments. The main objective of the project is to assist Ukraine in: 1- establishing permanently operating national GH inventory system; 2- developing an action plan as for implementation of JI administrative structure; and 3- preparation of the Second National Communication.

1.3 Priorities per country: regions and sectors

In 1998, the Government of Ukraine, in order to meet its commitments under the Convention, prepared and submitted to the Secretariat of the UNFCCC its First National Communication and First National Inventory.

The First National Communication, prepared in compliance with the requirements of the Secretariat, contains comprehensive and reliable information on the country. This includes modalities of accession to the UNFCCC, analysis of the economic situation, position of Ukraine within the regional context, main trends of economic development, assessment of the status of GHG emissions, national policies in relation to the global climate system, and voluntary measures aimed at the reduction of greenhouse gas emissions.

The First National Communication gives an estimate of the potential emission reduction at the national level. Among the major measures on climate change mitigation at the national level, priority is given to the introduction of energy saving equipment and technologies, active measures on energy conservation in all sectors of the economy, and to the development of renewable sources of energy and nuclear power.

The first GHG emission inventory was contained in the first and only National Communication of Ukraine (NC1) that has so far been forwarded to the Secretariat of the Convention. This complete study defines and quantifies the main sources of greenhouse gas emissions and their sinks. There are two very important aspects of the inventory: first, it gives a comprehensive, profound analysis and methodology for determining the emitters of greenhouse gas emissions and their sinks; second, it includes improved mechanism and methodologies of GHG emission inventory used by the UNFCCC. The inventory provides data on fuel combustion in all sectors of the economy, and on the share of different GHGs in the quantity of greenhouse gas emissions.

Among all sectors, emphasis was put on the largest emitters, such as power and transport. In 1990, the power sector accounted for 44% of the total emissions, while the transport sector accounted for 8 %. As for the rest of the sectors, 31% of the emissions were attributed to the industry, 13% to public services, and 3% to agriculture.

With regards to the Climate Change Conventions and Kyoto Protocol, there are no specific regions defined for implementation. However, it can be seen that there is more attention to the more industrial and energy demanding areas. These are East and South East parts of Ukraine (Kharkov, Lugansk, Dnepropetrovsk, Donetsk, Zaporozhie regions). Heat and power generation is relatively more evenly spread over the country.

1.4 Stakeholders most active in the field

Currently, the only Ukrainian consulting companies active in the field are the ones registered within Ukrainian State Committee for Energy Conservation (end 2004). Recent merging of the Committee with the Ministry of Economy reduces the possibility that the licenses of these consulting companies and their further involvement into the process will be extended.

The most active players in the field are the Ministry of Environment Protection of Ukraine and its' Regional Departments, Verkhovna Rada (Parliament) Committee for Environment Safety, and the Ministry of Fuel and Energy.

The most active university and/or research institutes in this field is the Kiev Polytechnical University (KPI). KPI has established an Energy Managers Training Institute and is training industrial environmentalists.

Although there is an *Ukrainian Network "Energy Efficient Cities" (UNEEC)*, civil society organizations are not active players in relation to the UNFCCC initiatives of Ukraine. UNEEC was established in 1999, and is a voluntary, non-governmental, non-profit organization whose members are mainly small and medium size municipalities. Currently, UNEEC has more than 40 member municipalities from all over Ukraine. The purpose of the organisation is to assist local governments, and business and local communities in solving their energy problems through promoting energy efficient political and environmental innovations.

Despite the number of registered energy and environment related consulting companies, these companies are not directly engaged into addressing the UNFCCC s issues.

1.5 Disseminate of the information

Many documents have been prepared and submitted to the relevant central government bodies and members of the inter-sectoral Commission. These documents mainly are:

- Ratification Package describing the status of the issues for further consideration and ratification procedures by Verkhovna Rada;
- Framework Convention Implementation Strategy;
- Materials and Guidelines prepared in the frames of Canadian - Ukrainian Project Climate Change Initiative;
- Memo for the national Security Council.

Furthermore, a number of training seminars, workshops and round tables have been performed in the framework of Technical Assistance Projects (e.g. TACIS, WB, UNIDO, UNEP). Representatives of all national economy sectors, local authorities, and big industrial companies (i.e. Ministers, Chairmen of the Parliament Committees, Municipal services, Heads of the companies) participated in these events. These events increased the awareness level among attendants; however, there is still no wide spread awareness at the different management levels.

The Aarhus Declaration requires Ukraine to provide information access for the public. Generally Ukraine fulfils these obligations. The basic means for the dissemination of

information are the press, radio, TV, printed media, and Internet information resources (e.g. the registered web site of the Ministry of Environmental Protection of Ukraine (www.menr.gov.ua) highlights the major relevant events in the country; however, the current info on the site is a bit outdated).

1.6 Implementation of the UNFCCC s

None of the Ukrainian enterprises has started the implementation of the UNFCCC. Furthermore, only 4 enterprises have started the implementation of the Pilot projects (power sector, construction materials, coal mining and agriculture). Hence it is early to assess the achievements or shortcomings of the implementation. However, a number of companies from the most active sectors listed above are currently preparing PINs for the future JI Projects.

Support to the Pilot projects mentioned above is provided in the frames of ERUPT Programme, financed by of Switzerland and Netherlands Governments, international organisations like WB, EU etc.

1.7 Existing capacity and capability to further disseminate and implement the MEAs

There are not many institutions capable to provide support to the UNFCCC's implementation. In addition, at the moment, it is not possible to indicate the number of companies capable to provide full-scale support to UNFCCC's implementation. The engineering consulting companies dealing with matters closely related to the MEA may be able to provide some support to UNFCCC's implementation. However, currently in Ukraine there is no company capable to deliver staff training aiming at the UNFCCC's implementation. The skill level of the trainers is not enough to perform this kind of activities. At the moment, training was just delivered through some technical assistance projects.

1.8 Factors hampering proper implementation

The common factors impeding the implementation of the UNFCCC could be summarized as follow:

- Incomplete Administrative Restructuring process (i.e. there is still no clear boarder lines between the functions and responsibilities of different Ministries and state bodies);
- Lack of the relevant infrastructure on the national level;
- Weak awareness from the subject businesses about the financial benefits of JI Projects implementation;
- Lack of technical and financial means for emissions monitoring;
- Lack of the national GHG Emissions Register;
- Lack of general public awareness about MEAs like Kyoto Protocol, Basel Convention etc.;

1.9 Results achieved

Quantitative or even qualitative assessment of the results achieved and of the environmental impacts is not possible due to the absence of the actual implemented projects.¹ However, some sectors/businesses are active in developing and implementing JI projects. These sectors are the following:

- Power Sector (including heat generation and supply);
- Construction materials industry;
- Chemical industry;
- Municipal household sector

1.10 Additional needs

Awareness about the general worldwide environmental concerns and the current trends to address environmental issues is still low both by public and businesses. Even though the businesses sector declared their endorsement to the declaration, and the Authorities have started imposing fines, neither a real concern about environment nor an understanding of the potential benefits from the investments into environment protection exists.

Changing of the situation requires certain measures to be taken. These measures include:

- Clear demonstration (using concrete examples and figures) of the financial outcome of the implementation of the UNFCCC and the application of environmental protections. These demonstrations should include all type of saving (cleaner production energy efficiency, etc.) and not just the reduction in taxation burden (if any)² of the companies making investments in the light of UNFCCCs.
- Establishment of the National GHG Register, and National wide infrastructure for JI Projects implementation.

¹ 4 to 5 JI Pilot Projects are currently in the development/initial implementation phase.

² Taxation matters are rather painful issues in the country. It is hardly to be expected that the Government in the nearest future will make taxation privileges for the industrial companies proceeding this way.

2 Basel Convention

2.1 Status of political acceptance

Ukraine acceded the Basel Convention on 1 July 1999 by adopting the “On acceding the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal” law. The rise in the public concern after the non-authorized import of hazardous wastes to some Ukrainian regions (e.g. to Rivne region) placed pressure on the government to adopt this law.

Since that time Ukraine implemented the system of state monitoring for the transboundary movement of hazardous wastes, and adopted a set of legislative acts for the strengthening of control over transboundary movement and disposal of hazardous wastes. The major three Resolution of the Cabinet of Ministers of Ukraine in this aspect are:

- Resolution No. 1120 of 13.07.2000: “On approval of Regulations on control of transboundary movements of wastes and their utilization/disposal and Yellow and Green lists of wastes”. Provisions for the monitoring of transboundary movement of hazardous waste are based on the national legislation recommended by the BC Secretariat for the countries-BC parties. National lists of the Yellow and Green wastes are created on the basis of A and B lists, accordingly, approved by the 3rd Conference of the BC Parities.
- Resolution No.574: “On assignment of the Competent Authority and Focal Point to fulfil obligations under the Basel Convention of Transboundary Movement of Hazardous Wastes and their Disposal”;
- Resolution No. 1219 of 19.08.2002: “On the approval of procedure and rules for the compulsory insurance of responsibility of exporter and person responsible for recycling (disposal) of hazardous waste as regards compensation for the damage that can occur to the human health, property and environment during transboundary movement and recycling (disposal) of hazardous waste”.

Thy national definition of hazardous wastes, when used in the above mentioned resolutions, is: “Hazardous wastes” are wastes included into division A of the Yellow List of wastes, wastes having one or more hazardous properties mentioned in the List of hazardous properties, or wastes that contain materials in large enough quantities to reveal these mentioned hazardous properties. The Yellow List of wastes is approved by the Cabinet of Ministers of Ukraine. The List of hazardous properties is approved by the Ministry of Environment Protection, and is included into the Green List, which is approved by the Cabinet of Ministers of Ukraine.

Export of hazardous wastes is carried out in accordance with the Basel Convention provisions. Import of wastes in Ukraine with the aim of their storage or disposal is forbidden based on the Law of Ukraine “On wastes” adapted on 5 March 1998. The Ministry of Environmental Protection of Ukraine, which is designated as the BC Competent Authority in Ukraine, issues or decline permits for the export, import or transit of hazardous wastes. Import of hazardous wastes could be permitted providing that there are appropriate capacities for their recycling, and that the appropriate regional authorities of the Ministry of Environmental Protection and the Ministry of Health (sanitary-epidemiological services) had priory authorized the import.

Pursuant to the Law of Ukraine “On the licensing of some types of business activities”, the Ministry of Environmental Protection is authorized to issue licenses to the entities carrying out activities in the field of hazardous waste handling and to monitor compliance of license terms by hazardous waste recycling operators. Such a license is a requirement for getting hazardous waste import permit.

2.2 Official action plans at the country and regional level

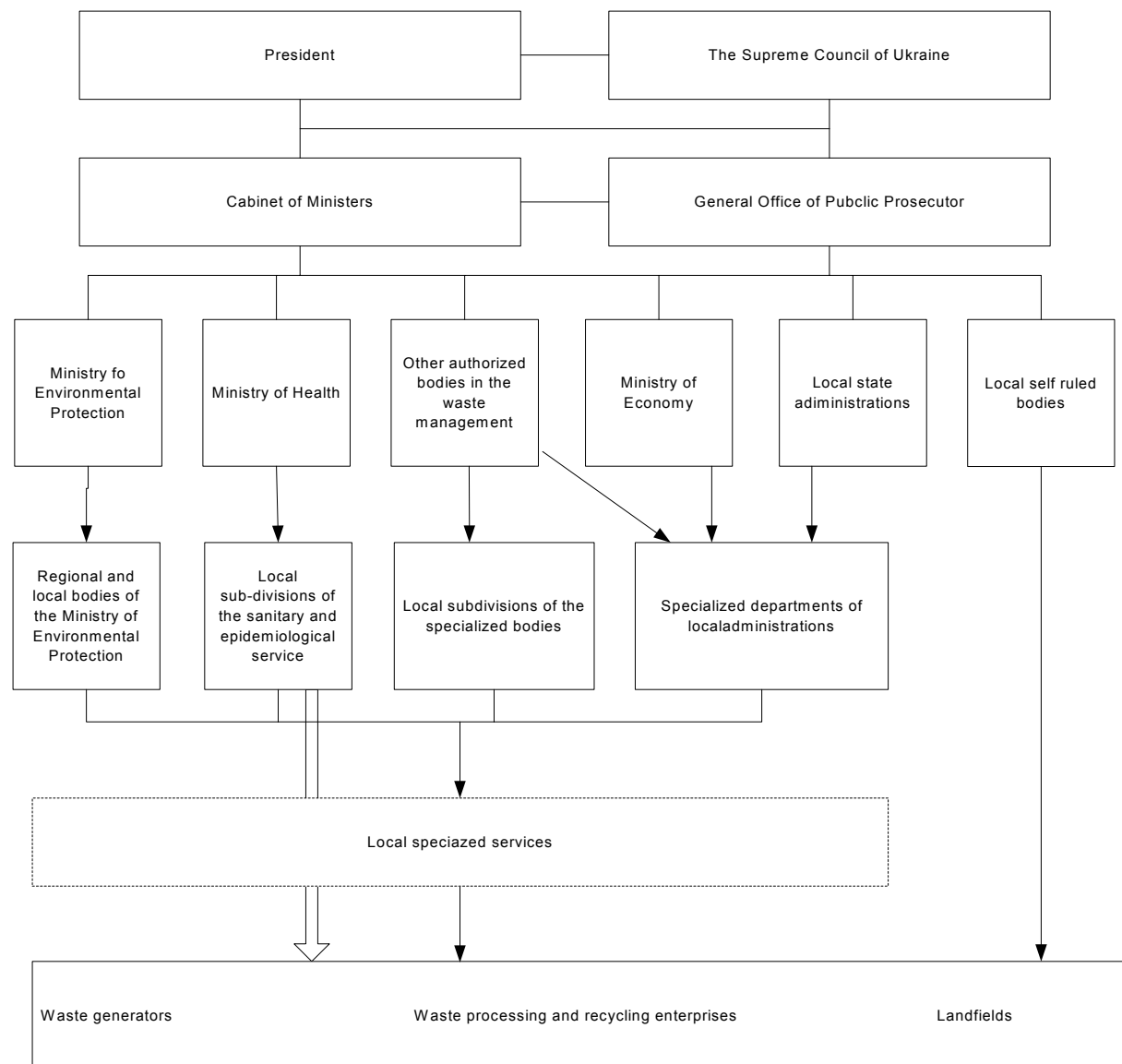
National Focal Point

The Ukrainian National Focal Point to the Basel Convention is the Ukrainian Research Institute of Environmental Problems in Kharkiv (Laboratory of Legal Provision of Environmental Safety) due to the Resolution of the Cabinet of Ministers of Ukraine No. 1433 of 13 September 2000).

Ukraine is a member of the Regional Centre of the Basel Convention for CIS countries established in 1981. Activities of CIS RCBC cover the following countries of the CIS: Republic of Azerbaijan, Republic of Armenia, Belarus Republic, Georgia, Republic of Kazakhstan, Kyrgyz Republic, Moldova Republic, the Russian Federation, Republic of Tajikistan, Turkmenistan, Republic of Uzbekistan, and Ukraine.

The main objective of CIS RCBC is to implement capacity building programs, including training, re-training and qualification upgrading, for the personnel of the regional countries on the handling of wastes and their transboundary movement. The main functions of CIS RCBC are: training, transfer of advanced technologies for wastes treatment and low-wastes technologies, information exchange on the environmentally sound handling of wastes, consulting the countries of the relevant region on wastes handling and trans-boundary movement of wastes, awareness-building of the public on the topics of wastes handling, development of project proposals initiated by the regional countries on different aspect of the Basel Convention, fostering of partnership with industry and business on the environmentally sound management of hazardous wastes.

The Ukrainian state bodies manage the Ukrainian national waste management. These state bodies include the central bodies of legislative and executive power, the regional executive bodies, and the local authorities and their executive bodies. Waste generators and waste disposal and landfill entities are the objects of the management. The organizational structure of the state waste management sector is presented below.



Verkhovna Rada (Supreme Council) of Ukraine

Verkhovna Rada (Supreme Council) of Ukraine is the sole legislative power body in Ukraine, and its main role includes: adoption of laws, approval of the national programs including the environmental protection programs, and the approval upon address from the President of Ukraine of decrees announcing certain localities as zones of environmental emergency.

The President of Ukraine

The President of Ukraine performs a regulative action through issuing Decrees. Some of these decrees may touch upon particular issues of waste management, requiring an immediate solution.

The Cabinet of Ministers of Ukraine

The Cabinet of Ministers of Ukraine is the highest body within the system of executive power authorities. The Cabinet is responsible to the President of Ukraine, and accountable to the Supreme Council of Ukraine. The responsibilities of the Cabinet include developing and implementing the national programs of economic, scientific, technical, social, and cultural development of Ukraine. The Cabinet also directs and coordinates the activities of the ministries and the other executive power bodies.

The Ministry of Environmental Protection (MEP)

The Ministry of Environmental Protection (MEP) is the main authority regarding the execution of the Basel Convention. The activities of the Ministry are directed and coordinated by the Cabinet of Ministers of Ukraine. The Ministry organizes execution of legislative acts and carries out control of their realization, elaborates proposals on legislation improvement, and is the key administrator of environmental protection fund. The main functions of MEP include:

- Carries out state control over observance of rules, norms, limits, and quotas in the field of environmental safety requirements in the field of waste management;
- Organizes and carries out state environmental expertise;
- Organizes, within its competence, the conduction of natural environment monitoring, and the establishment and functioning of environmental and other information systems;
- Approves or conforms, following established procedure, rules, and norms on natural environment protection, environmental safety, and waste management. Also carries out analysis on the application of these rules and develop recommendations on the elaboration of other rules, norms;
- Issues, following legislatively established procedure, permits, limits, and quotas for emissions of pollutants in natural environment, and allowable levels of harmful impact;
- Issues, pursuant to the law, permits for carrying-out operations in the field of waste management;
- Ensures approval of the draft documents for allotting of land plots for placing of environmentally hazardous and other objects.

The Ministry has regional representative offices i.e. oblast departments for environmental protection, and city environmental inspectorates.

Ministry of Health

The Ministry of Health deals with all aspects that could have harmful public health impact. Its functions include: perform control and supervision over observance of sanitary legislation; state standards criteria and requirements;; ensure sanitary and epidemic safety of population; ensure carrying-out state sanitary-hygienic expertise; investigates, analyzes, and forecasts indicators of human health situation depending on condition of human vital activity environment; participates in working out measures, aimed at non-admission of harmful impact of environmental factors on human health; approves state sanitary norms, and rules; conforms, following legislatively established procedure, all state standards, technical specifications, industrial samples, and other normative-technical documentation of objects.

The organizational structure of the Ministry includes the sanitary-epidemiological service. The state sanitary and epidemiological service of Ukraine performs state sanitary and epidemiological supervision of the observance of sanitary legislation by juridical and private entities. The purpose of the supervision is to prevent, reveal, abate or liquidate the harmful impact of the waste on the natural environment and human health while it is generated, collected, transported, stored, processed, utilized, disposed of, detoxified and buried. The structure of the sanitary and epidemiological service includes the bodies, institutions and organizations of sanitary and epidemiological profile of the Healthcare Ministry of Ukraine, and respective subdivisions of other ministries and departments, legally defined.

Other Ministries and Offices

- The Ministry of Finance role is to ensure state budget, including reserve fund, financing of environmental protection measures.
- The Ministry of Economy conducts economic feasibility of the environmental protection measures funded by the state budget, including reserve fund.
- The Ministry of Emergency Situations main authorities are the prevention and elimination of consequences of natural and man-caused emergencies and disasters, state control of fire safety.
- The Office of Public Prosecutor is entrusted with supervision and observance of laws related to economic, international relations, environmental protection, customs, and foreign-economic activities. Organizational structure of the office includes departments of environmental procurement.
- The local self-government system. It comprises the following entities: territorial communities; village, settlement, and city councils; village, settlement, and city mayors; executive bodies of village, settlement, and city council; rayon and oblast councils, which represent joint interests of territorial communities of villages, settlements, and cities; and bodies of citizens self-organizations. The Law on Waste contains a number of waste planning provisions directed at national, regional and local level. These provisions places the Local State Administration under the obligation to oversee that regional and local waste management programmes, as well as the so-called sanitary waste control programmes, are developed and implemented by the Local Self governments.
- The Local state administrations together with the local bodies of the MEP define the list of waste handling sites, which shall be included in the Register. They also notify owners of the necessity of submitting a passport. The local authorities dispose of broad discretionary powers in this respect. According to information received from one oblast, for example, according to a rule exercised at the local level, the sites storing less than 20 tons of wastes are not exempted from the passport requirement. The oblast level has little or no interference with the local authorities regarding which sites are obliged to provide a passport. The passport contains detailed quantitative and qualitative information about the wastes disposed of at the site, their quantitative and qualitative composition, their origin, their technical characteristics, and information on control and safe operation methods.

Ukrainian legislation attaches the responsibility for waste primarily to the owner of the waste. It defines wastes without an owner as abandoned wastes. If abandoned waste is found on land owned by a private person, this person has the obligation to notify the authorities thereof, and shall take measures to identify the owner of this waste, degree of

its hazardousness, ensure that the waste is entered into books and records, and decide on its management.

The Law on Wastes considered abandoned waste located on the premises of a territorial community to be under the ownership of that respective territorial community. Abandoned waste located in the territory of Ukraine, but outside the property of a territorial community, is considered to be owned by the State. In Other words, where the owner of abandoned waste cannot be identified, either the State or the local governments shall take responsibility for that waste.

Specific action plans launched

On 05.03.1998 Verkhovna Rada (Parliament) of Ukraine adopted the national strategy of wastes generation minimization. This strategy was included into the legislative document “The main directions of the state policy in the field of environment protection, natural resources use and ecological safety ensuring”.

The National Hazardous Waste Management Program, adopted in September 2000, takes all the provisions of the Basel Convention into account. The program adopts the principles that waste shall be disposed of at the source, and that the generation of waste shall be minimised at all levels.

The National Hazardous Waste Management Program should be mainly financed from the state budget, the State Environmental Protection Fund, local budgets, and own funds of industrial enterprises – waste generators. Total expenditures of the activities envisaged by the programme are estimated to be approximately 78 million UAH. However, during the last five years, the Supreme Council of Ukraine (Verkhovna Rada) and the Government have adopted nearly 1,000 different development programs and about 200 concepts. Practically all of these programs stipulate development of corresponding sub-programs at regional level. The large number of programs and limited budget has resulted in the fact that many programs remain unimplemented. However, according to the Ministry of Environmental Protection, the National Waste Management Program is among the few that are financed (about 50% of the planned financing).

Financial and regulatory supportive mechanisms

Regulatory mechanism

The Law on Environmental Protection adopted in 1991 contains general provisions on the environmental protection including waste impact. It makes waste disposal subject to the following regulations: 1-need for a permit, 2- priority of reuse and recovery over disposal, and 3- Safety of human health and the environment when disposal is adopted.

The Law on Wastes was first adopted in 1998. Its provisions on hazardous waste management were strengthened when it was substantially amended in 2002. The Law on Wastes contains a number of measures and requirements that encourage the reuse and recycling of wastes. These measures require the local state administrations and the local self-government to:

- Facilitate the collection of waste for recycling.
- Issue permits for collection of recyclable waste.

- Adopt local and regional waste management programmes based on the waste management hierarchy.

In addition to the two laws mentioned above, other relevant laws regulating hazardous waste handling are:

- “On the withdrawal from circulation, treatment, utilization, elimination or further use of unsound and hazardous products”, adopted on 14 January 2000.
- “On transportation of dangerous loads”, adopted on 6 April 2000.
- “On the enhanced danger sites”, adopted on 2 March 1995.

The implementing of the legislations is set through many Resolutions issued by the Cabinet of Ministers. In respect of the hazardous waste management, the main resolution is Resolution No. 1120 of 13 July 2000 “On approval of Regulations on control of transboundary movements of wastes and their utilization/disposal and Yellow and Green lists of wastes” of the Cabinet of Ministers

Further specifications of the stipulations of Cabinet of Ministers Resolutions are usually contained in Ministerial Orders.

The waste legislation is supplemented at the oblast and local level by local and regional waste management programmes and City State Administration Resolutions, which include provisions on collection, recycling, and disposal of wastes.

Financial mechanism

Funds for public environmental expenditure come from general taxation, via the state budget, and from pollution charges and fines, via the Environment Funds. Pursuant to the “Procedure for development, approval, and revision of the limits for waste generation and disposal” (approved by the Resolution of the Cabinet of Ministers of Ukraine No. 1218 of 3.08.1998), every waste owner shall have limits for waste generation or disposal, approved by the regional bodies of the Ministry of Environmental Protection. As revenues are collected by imposing user charges on the basis of these limits, the revenues are then shared among the national, regional and the local governments, and can only be spent on environmental activities.

On 24 May 2004, the Cabinet of Ministers set up a specialized fund for the motivation and financing of environmental protection measures.

Among the main objectives of the Fund are:

- Promotion of additional funds to finance environmental protection measures.
- Promotion of market mechanism to ensure financing of the environment protection.

Currently, the Ministry of Environmental Protection has developed and submitted to the stakeholders a draft of a new resolution of the Cabinet of Ministers titled “On the procedure for financial supporting the activities of State Environmental Protection Fund based on low interest rate credits of commercial banks”.

2.3 Priorities per country: regions and sectors

There are four classes of hazardous waste in Ukraine are classified in four classes (I to IV); Class I is the most dangerous, and Class IV is the least dangerous. The classification of a waste depends on the content of high-toxic compounds in the waste, or on the list of wastes from the State Classifier of Waste DK 005-96. Currently, experts are reviewing and evaluating the Classifier to make it more harmonized with the European list of wastes.

The main generators of hazardous waste in Ukraine are enterprises of ferrous and non-ferrous metallurgy, chemical industry, and machine building (electroplating production) industry. Metallurgy and petrochemical industries account for about 70% of Ukraine's gross product and are, thus, the largest generators of wastes. Also, significant amounts of waste are generated by the mining and processing industries. Waste includes large-tonnage of ashes and ash-and-slag waste of thermal power plants, coal mining and coal-preparation, complex ores dressing, slag of metallurgy production, and sludge of aluminous production.

Machine building industry in Ukraine uses old and worn-down production equipment with a low efficient consumption of raw materials. Thus, Machine building industry is the third largest producer of waste in the country after the mining industry and the chemical industry. This sector consumes one of the biggest shares of the resources and raw materials of all industry sectors in Ukraine.

The machine building industries have their own manufacturing, surface treatment, and assembly departments. The surface treatment departments, with electroplating and painting workshops, have the biggest negative impact on the environment. Inefficient use of heavy metals, water and energy and the resulting wastewater and sludge are the main reason of waste production in the electroplating departments. In the painting departments, the inefficient use of paint and solvents leads to the evaporation of solvents to the atmosphere, and the precipitation of paint sludge as solid waste

Regions to be targeted per the Basel Convention

Ukraine has 3 major economic regions. These regions are:

- Donetsk-Dnipro: It hosts mining, metallurgical, chemical and machine building enterprises.
- Central-Western: It hosts processing, light and food-processing enterprises.
- Southern region: It hosts shipbuilding enterprises, seaport economy and recreational facilities.

Out of the 27 regions in Ukraine, four regions, namely Dnipropetrovsk, Donetsk Zaporizhia and Luhansk oblasts, generate about 90 per cent of the hazardous waste generated annually in Ukraine. This is because hazardous waste generation is closely linked to the mining, metallurgical, chemical and machine building industries, which are located in the regions.

Table 1. Generation and handling of toxic (all 4 classes) wastes in the Ukrainian regions, 2002 (in thousand tones)

Region	Toxic waste	Utilized/recycled	Destructed	Disposed at	Accumulated on the sites
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	generated			special dumps	of enterprises
Autonomous Republic of the Crimea	437.8	19.8	0.0	138.7	10528.9
Vinnitsa	36.8	0.1	0.3	2.0	434.2
Volyn	2.4	0.7	0.0	0.0	2.5
Dnipropetrovsk	37191.9	13521.9	3.3	24788.0	1782385.2
Donetsk	23719.3	9760.3	40.2	10647.8	426790.9
Zhitomir	0.7	0.3	0.0	-	1.1
Zakarpatska	6.9	1.4	1.1	1.4	6.3
Zaporizhia	5518.3	2377.3	0.8	1793.2	105272.9
Ivano-Frankivsk	857.8	384.2	22.2	527.5	45937.3
Kiev	659.4	80.7	0.0	553.0	21403.6
Kirovograd	794.4	4.6	0.1	784.3	53831.1
Luhansk	5391.8	3397.9	221.3	2469.0	100445.8
Lviv	756.4	119.7	9.4	552.9	81223.7
Mykolaiv	311.0	802.5	17.1	178.6	1947.9
Odessa	31.2	3.5	0.1	0.6	2006.6
Poltava	230.8	9.1	20.5	157.5	5289.9
Rivno	26.8	15.0	2.4	8.4	16914.8
Sumy	397.3	39.6	46.0	278.1	28390.5
Ternopil	0.5	0.4	0.0	0.0	0.5
Kharkiv	978.4	372.3	13.8	453.2	32929.0
Kherson	7.2	0.2	135.0	0.1	125.8
Khmelnitskiy	4.8	1.3	0.0	0.1	7.2
Cherkassy	148.9	9.5	88.9	23.3	4611.8
Chernivtsi	21.7	0.0	0.0	0.0	194.2
Chernyiv	58.1	0.4	5.8	17.4	1995.5
City of Kiev	13.2	1.4	0.1	0.3	194.4
City of	1.1	0.1	0.0	0.0	1.6

Sevastopol					
Total, Ukraine	77,604.9	30,924.2	628.4	43,375.4	2,722,873.2

Source: State Statistics Committee

The table shows that huge amounts of waste are accumulated on the sites of industrial enterprises. There is a profound lack of an effective nation-wide infrastructure for hazardous waste handling (collection, treatment and disposal systems) in the country. Consequently, these and some other regions experience severe difficulties in handling and disposal of hazardous waste. According to the Ministry of Environmental Protection, 95% of toxic wastes are stored at the sites of the enterprises that generated the wastes. Surface dumpsites (or waste heaps) are the locations where industrial waste has been dumped for years and they are usually located next to the enterprises generating the waste in order to minimise transportation distance.

The most frequently occurring contaminants are hydro-carbons, heavy metals (galvanic sludge), spent emulsions and cooling fluids, oil sludge, paint and solvent wastes, spent moulding forms, mercury containing lamps, building material, metal scrap, organic solvents, chemicals, and rubber.

The construction of specialized hazardous waste dumps has been on the national agenda since the 80's. This issue is still not resolved due to the public resistance about the locations of the dumps, lack of political will, and underestimation of the environmental danger.

Priorities

National environmental policy sets the following targets in the field of hazardous waste management:

- Establishment of specialized enterprises for hazardous waste recycling and destruction.
- Establishment of environmentally sound disposal sites for hazardous wastes.
- Minimization of wastes generated in the production processes.
- Maximum recycling and utilization of waste as secondary raw.
- Application of least cost environmentally sound methods of waste processing.

Target group acceptance of the priorities

The legislations in place in Ukraine force industrial enterprises and other entities and organizations that are dealing with hazardous wastes to comply with the following rules:

- Ensure appropriately storage of hazardous wastes in accordance with the sanitary, environmental and fire protection norms and regulations.
- Prevent and reduce generation of hazardous wastes.
- Get necessary permits for the generation and storage/dumping of hazardous wastes in duly terms.
- Use only the sites agreed in the permit for the purpose of hazardous waste handling.

- Keep hazardous waste record.
- Ensure training, retraining and certification of the staff dealing with hazardous wastes.
- Eliminate storage and disposal of hazardous waste on non-authorized locations/sites.
- Get the license for hazardous waste handling in duly established procedure.

The existing system of environmental monitoring is not able to solve the waste prevention problem since it's based only on the control and punishment for non-compliance to the environmental norms and regulations. Ukraine's current system of pollution charges, taxes and tariffs does not provide adequate incentives for pollution prevention or for investment in pollution controls, especially at the local level.

Old and poorly maintained industrial plants and lack of effective monitoring constitute the basic causes for the present high level of generation of hazardous waste in Ukraine. Relative cheap natural resources, rather low waste fees and weak enforcement of the environmental regulations, and a generally unfavourable investment climate do not provide the enterprises with incentives to carry out investments in new and cleaner technologies that will reduce the volume of hazardous waste generated.

Plant directors and managers with authority to install treatment equipment are often unwilling to risk a decrease in productivity and to drain scarce capital by investing in something with no perceived short-term economic benefits. Even the largest and most profitable enterprises often insist that they cannot afford to install, operate, or maintain treatment equipment and recover contaminated areas.

2.4 Stakeholders most active in the field

Local government:

The National Programme of hazardous waste handling require the Oblast (Regional) Administrations to identify the entire quantity of waste generated in the region, and to develop the regional plan to reduce waste generation. The programme also envisages the establishment of hazardous waste handling centres on the regional level. In co-operation with the regional departments of the Ministry of Environmental Protection, the regional authorities of Vinnytsya, Donetsk, Zhitomir, Zaporizhia, Mykolaiv, Odessa, Poltava, Rivne, Sumy, Kharkiv, Chernyiv, and Chernovtsy, and the City Administration of Kiev have established such programs.

In addition, a regional waste handling centre was established in Donetsk region. Also, similar activities are happening in Zaporizhia, Kiev, Luhansk, Poltava and Lviv regions.

Industry associations

Industrial associations are not well developed in Ukraine. Hazardous waste is recycled at the authorized and licensed enterprises that have appropriate equipment and technologies for processing and destruction of these wastes. The JSC "Mykitrut" (Donetsk region) which is the only one company in Ukraine that is able to process all types of mercury containing wastes. ISTA Corporation (Dnipropetrovsk) produces lead batteries and offers the whole range of services in their recycling. Being a ACCORD (Cherkassy) is a member of the Hazardous Waste Handling Corporation and recycles paint, enamel, varnish wastes, spent electrolytes, galvanic sludge, and obsolete medical chemicals, etc.

Universities and research institutes

Universities and research institutes are mostly involved into expertise evaluations of different issues in the field of hazardous waste handling, e.g. investigation of hazardous waste physical-chemical properties, development of waste handling technologies, investigation of waste impact on human health, and improvement of legislation in the field of hazardous waste management.

Research institutes are also involved into solving tasks stipulated in the National Hazardous Waste Handling Programme. Some of these tasks are:

- Development of standard designs and design solutions for establishment of regional sites for destruction, recycling and disposal of hazardous wastes.
- Elaboration of proposals on destructions and processing of PCB containing wastes.
- Inventory of dumpsites to elaborate further environment protection measures.
- Development and implementation of waste recycling methods for regeneration of heavy and ferrous metals.

Civil society organizations and other not-for-profit organisations

Within the last years, the participation of non-governmental organizations in the issues related to hazardous waste handling has increased in Ukraine, especially when it relates to the import of hazardous waste to Ukraine.

It is rather difficult to clarify the number and names of NGOs active in the field of hazardous waste handling due to the inconsistency of available information. However, "Zelenyi Svit" and MAMA 86 seem to be the most active NGOs in this domain.

2.5 Dissemination of the information

In general, the level of awareness about the existence and requirements of the Basel Convention among the governmental organizations, industry and public is low. Knowledge is mainly disseminated among professionals and experts from the Ministry of Environmental Protection, Ministry of Health, MEP regional divisions, MH sanitary epidemiological services, and appropriate research institutes.

Information about the Basel Convention, text of the convention, and related Ukrainian legislative acts are available online at www.waste.com.ua

Notification about implementation of monitoring procedure for transboundary transportation of hazardous wastes, pursuant to the Resolution of the Cabinet of Ministers No. 1120 of 13.06.2000, was published in the official press. Just after the procedure became effective (01.09.2000), official information about the above procedure was submitted to the BC Secretariat.

Ukraine takes an active part in the work of the BC Regional centre in Bratislava for the countries of CEE. Dozens of leading Ukrainian experts from governmental, research, and industrial organizations dealing with hazardous waste management pursued training that was organized by the centre.

The Advanced Training Institute under the Ministry of Environmental Protection has organized training on the functioning of transboundary movement monitoring system.

Based on Interviews with governmental officers and industry representatives, there is need to get information and experience on the following issues:

- Improvement of the legislative base in the field of hazardous waste handling and minimization.
- Modernisation of the technical solutions in hazardous waste minimization, processing, destruction, disposal.
- Development of occupational safety in handling hazardous waste.
- Acquirement of international experience in disposal of hazardous waste.

2.6 Implementation of the Basel Convention

National hazardous waste handling programme envisages 22 demonstration projects. Few of these projects are:

- Establishment of toxic waste destruction and recycling enterprise in Kirovograd region.
- Destruction of beryllium waste generated by ZAKID company.
- Rehabilitation of existing disposal sites in Vinnitsa, Donetsk, Zaporizhia and Cherkassy regions.

The implementation of some of the projects is already accomplished, however due to the limited funding there are proposals to prolong the programme till the year 2007. The main focus of the programme is on the safe disposal and recycling of generated hazardous waste rather than to the prevention of their generation.

Cleaner production is still at its primitive stage in Ukraine. The Basic Capacity Level (i.e. the minimum level needed for cleaner production concepts and principles to be disseminated spontaneously throughout industry and society) is unlikely to be reached in the near future in Ukraine. The expansion of cleaner production requires the adoption of some environmental policy measures, especially financial incentives for. Ukraine needs to apply the mix of policies and instruments, which is best adapted to its circumstances, facilitating a greater use of integrated, preventive environmental strategies.

The main achievements in the promotion of hazardous waste prevention were mostly gained in the projects financed within different technical assistance programmes.

Examples of Implementation Projects

- I. The **Donetsk/Dnipropetrovsk Industrial Waste Management Project** was a demonstration project under the regional Environmental Policy and Technology Project (EPT). Its purpose was to assist countries in the NIS to undertake more effective environmental management of contaminating industrial facilities, and to demonstrate the economic benefits of pollution prevention and recycling to industry business operations. It established a foundation for a practical, cost-

effective waste management program that can be undertaken by Ukraine's Ministry of Environmental Protection. The tasks included environmental auditing of enterprises, efforts to improve methods of government regulation, logistical support for interventions, promotion of public involvement in the environmental decision-making process, and training and application of the ISO 14000 environmental management standards series. For example, at AZOVSTAL, Ukraine's largest steel making facility, a pollution prevention and recycling project was completed achieving engineering, production process, and management changes. AZOVSTAL is now reproducing the design on a second production line using its own investment funds.

- II. USAID supported 18 demonstration projects conducted by the World Environment Centre at 10 enterprises in both regions. The project has two major components: 1- Identifies low-cost/no-cost approaches to waste minimization management, and 2- Expands the program through training the trainer approaches to as many enterprises as possible. These projects brought Ukraine closer to compliance with the waste management requirements for Basel Convention and the international market. The projects also improved Ukraine's capacity to protect public health from environmental releases, and the competitiveness of Ukraine's industrial base in the world market.

- III. Development of Regional Industrial Waste Management Strategy for Kharkiv Oblast: It included strategy development, industrial waste inventory development, development of data collection, and management system recommendations. Provision was made for the training in the form of six workshops. Preliminary designs were prepared for centralised facilities for industrial waste management.

- IV. The Ministry of Environment Protection and the Danish Ministry of Environment and Energy initiated the "Cleaner Technology in Machine Building Industry in Ukraine". The main goal of the project was to build capacity in the implementation of the CT concept in the machine building industry – one of the main polluting industries in Ukraine. The project included other activities as described as follow:
 - Screening of machine building enterprises for further implementation of no-, low-, and high-cost demonstration projects.
 - Training of local experts in the CT concept. Also training of local enterprise managers in the implementation of more efficient production methods.
 - Support local demonstration projects at enterprises where new and cleaner technologies were implemented.
 - Establish a CT support centre in Ukraine to facilitate the future activities and dissemination of CTs to other enterprises and industrial sectors.

The Cleaner Technologies Centre of Ukraine and Ukrainian industries are both involved in financing these activities in addition to the funds coming from grants.

2.7 Existing capacity and capability to further disseminate and implement the MEA's

Many institutions in Ukraine are active in the implementation of the Basel Convention. The following institutions play a focal role:

- I. The National Centre for Hazardous Waste Management was established in 1997 by Resolution of the Ukrainian Cabinet of Ministers in order to develop and implement technical and technological measures in the field of the hazardous wastes management at all stages of the lifetime cycle. The Centre is a division of the Ukrainian Ministry of Environment and Natural Resources. The main activities of the Centre are the following:
 - Scientific and methodological follow up of the State programmes. Follow up on the fulfilment of Ukraine to its obligations in the frames of international conventions and agreements relevant to the hazardous wastes (HW) and hazardous chemicals (HC) management.
 - Co-ordination of the activities related to the development of the legislative and regulatory documents, and the creation of the information database for HW HC management.
 - Development of the methodology and establishment of the expert groups for environmental expertise in the field of hazardous wastes and chemicals management.
 - Development of the standard organisational, economical and technological schemes for hazardous wastes management in the frames of the National and International pilot programmes.
 - Performance of routine co-ordination functions for implementation of the National wide programme for the hazardous wastes management. Also, encourage leading experts of the Ukrainian Academy of Science and R&D institutes to get evolved in the program activities.
- II. The Ukrainian Scientific Research Institute of Ecological Problems (USRIEP) was established in Kharkiv in 1971. Key areas of the USRIEP's research activities that are related to environment protection, sustainable use of natural resources, and environmental safety, are listed below:
 - Formulation of the concept of the state environmental policy with the objective to maintain the ecological equilibrium, ensure the environmental (and radiation) safety, improve the ecological state of natural environment and its components.
 - Establishment/strengthening of the legal, regulatory, economic and institutional framework of environmental management.
 - Providing a scientific rational for the control and management of water resources.
 - Strengthening the capacity of environmental monitoring through the provision of scientific, methodological, metrological, technical, informational, legal and institutional support.
 - Preparing the environmental action programmes, draft regulations/standards, integrated nature protection measures, environmental impact assessment (EIA) document; and providing a scientific framework for the environmental due diligence review and environmental auditing;
 - Developing environmentally sound sanitation technologies and schemes;
 - Preparing the industrial waste management strategies and plans;
 - Examining the state of air basin, and planning the actions on its protection;

- Providing a scientifically sound rationale for the development of protected areas and natural reserve networks;
- Ensuring the conservation of biological diversity;
- Providing the scientific and methodological support to the relevant regulatory authorities in the field of environment protection/management and natural resource management;
- Drafting the legislation and regulations to provide a framework for the sustainable development planning on a regional basis;
- Supporting the regional capacity for environmental management.
- Provide support within the activities of the industrial waste management centre.
- Provide support within the activities of the inter-departmental environmental centre.

2.8 Factors hampering proper implementation

Many factors are hampering proper implementation of the Basel Convention. Among these factors, the following are the most important:

- Low level of awareness and the absence of environmental culture in both wastes and hazardous waste management, in particular, among the industry and the public.
- Low level of funding of waste recycling and disposal due to the fact that the implementation of the Basel Convention is still in a transition period.
- Lack of efficient monitoring of industrial enterprises (inadequate number of environmental inspectors and) and lack of monitoring-analyzing equipment.
- Worn out and outdated production equipment and technologies.

2.9 Additional needs

The obstacles to the national implementation and compliance with the Basel Convention seem to be the following:

- Lack of awareness of the implementing authorities about the obligations arising under the BC.
- Lack of technical, administrative and financial capacity.
- Lack of coordination among relevant national authorities.
- Insufficient capacity building for the personals (for example, training).
- Insufficient budget allocations, changes in economic circumstances or unforeseen costs of implementation.

ACME Global Status Report

- Annex 2 -

**Overview of the Implementation
of MEAs and CP in India
(India country status report)**

TABLE OF CONTENTS

1	Kyoto Protocol	3
1.1	Status of political acceptance	3
1.2	Legal / Administrative Frame Work	3
1.3	National Initiatives	4
1.4	International Collaboration.....	5
1.5	Recent Developments	7
1.6	Issues and concerns related to project preparation and approval.....	9
2	Basel Convention.....	11
2.1	Status of political acceptance	11
2.2	Legal and administrative Framework	11
2.3	National Initiatives	14
2.4	Example of Government Enforcement of Cleaner Production.....	15
3	Stockholm Convention.....	17
3.1	Status of political acceptance	17
3.2	Legal / administrative framework.....	18
3.3	National initiatives	20
3.4	National institutions and Capacity Building	22
3.5	Issues and concerns	22

1 Kyoto Protocol

1.1 Status of political acceptance

UNFCCC

- India signed UNFCCC on June 10, 1992
- Ratified the Convention on November 1, 1993

Kyoto Protocol

- Signed the protocol in November 1997
- Ratified in August 2002
- Set up designated National authority for CDM projects in December 2003
- The protocol came into force Feb 16, 2005 with Russia ratifying it.

1. The purpose of the clean development mechanism (CDM) is defined in Article 12 of the Kyoto Protocol to the United Nations Framework Convention on Climate Change. The CDM has a two-fold purpose: (a) to assist developing country Parties in achieving sustainable development, thereby contributing to the ultimate objective of the Convention, and (b) to assist developed country Parties in achieving compliance with part of their quantified emission limitation and reduction commitments under Article 3. Each CDM project activity should meet the above two-fold purpose.
2. India, being non-Annexe-I country, does not have any emissions reduction obligation under the protocol. India is a signatory to the Kyoto Protocol to reduce greenhouse gas emissions worldwide. However, been a developing nation, unlike the industrialized nations it is not required to contribute to the effort. Consequently, the major focus of the country with regards to the Kyoto Protocol is CDM, or Clean Development Mechanism. When implemented in developing countries, CDM projects make the reduction in carbon production a commodity. Nations can sell the rights to emit carbon dioxide by adopting cleaner and eco-friendly technologies.
3. Currently, there is no political discontent over India's status under the Kyoto Protocol. It is widely anticipated that India will be a force to consider within carbon trading market in the near future.

1.2 Legal / Administrative Frame Work

1. India has demonstrated its participation in CDM by setting-up the DNA (Designated National Authority) known as the NCA (National CDM Authority) and

- by according the host country approvals. Also recently, India completed the World Bank's National Strategy Study for CDM implementation in India.
2. The DNA consists of the following entities:
 - Chairperson: Secretary, MoEF
 - Members or nominee of:
 - Foreign Secretary
 - Finance Secretary
 - Secretary, Industrial Policy and Promotion
 - Secretary, Ministry of Non-Conventional Energy Sources
 - Secretary, Ministry of Power
 - Secretary, Planning Commission
 - Joint Secretary (Climate Change), MOEF
 - Member Secretary: Director (Climate Change), MOEF
 3. The NCA endeavours to provide approval for the qualifying projects within 60 days of receiving the application. To guide the stakeholders in developing CDM projects, the MoEF has announced interim CDM project approval criteria (<http://envfor.nic.in/cc/cdm/criteria.htm>). So far the NCA has provided host country approvals for 78 projects (as on April 30, 2005). The government has played a key role in getting permission for unilateral projects; i.e., projects where a person, a group of persons or industry units embark on a project that can qualify for CDM. Once cleared by the host country and CDM Executive Board, the project can accumulate carbon credits for sale in the trading market. Almost 90 per cent of Indian projects are unilateral ones.

1.3 National Initiatives

1. Some of the activities undertaken in India on CDM in the last six months ending March 2005 include: a creation of an association for Indian project promoters, completion of CDM NSS (National Strategy Study)-India study, host of capacity building workshops, registration of the first Indian CDM project at the CDM EB (Executive Board). As on April 30, 2005, about 78 diverse CDM projects have received the host country approval. These projects include: using biomass to generate power electricity, generate electricity from sugar cane processing, converting municipal solid waste to energy, energy-efficient processing of fuel-intensive industries such as steel, cement, aluminium, etc.
2. India does not have any currently set target as far as Kyoto is concerned.
3. The large number of CDM proposals that has come up in India in a short span of six months is an indication on how industry and community organizations seize the opportunity. India has by far the highest number of proposals pending before the CDM EB. The fact that most of these are unilateral projects (self-financed

- and has no tie-up with an annexe-I country for selling carbon credits) shows the willingness of the Indian industry and community organizations to undertake risk.
4. The Government of India prepared a mandatory national communication document to UNFCCC (www.natcomindia.org). The document submitted last year elaborately covers emission levels of GHGS from India from all possible sources. The document contains authentic Indian emissions data.
 5. Central and state governments have assumed the role of facilitator. Some initiatives undertaken include the establishment of “**state clean development mechanism cells**” in India. The few states in India that took the lead to establish these state nodal cells for the promotion of CDM are: Andhra Pradesh, Madhya Pradesh, and West Bengal. It is anticipated that Karnataka, Maharashtra, and Tamil Nadu will soon establish such cells.
 - CDM Cell in Andhra Pradesh: The Government of Andhra Pradesh has recognized EPTRI (Environment Protection Training and Research Institute) as the nodal agency for CDM. The EPTRI is involved in the capacity building of industries, government officials, and consultants on CDM so that they can avail the benefits of carbon trading under the Kyoto Protocol.
 - CDM Cell in Madhya Pradesh: A CDM Cell has been set up at MPPCB (Madhya Pradesh Pollution Control Board), Bhopal. The MPPCB is closely dealing with several industries regarding environmental degradation, and thus can facilitate promotion of CDM in the state by sensitizing industries. The member secretary will coordinate the CDM Cell. In addition, a Steering Committee at the state level has also been constituted. The Cell will act in coordination with the Steering Committee, Government of Madhya Pradesh, and the Ministry of Environment and Forests at the Indian Government.
 - CDM Cell in West Bengal: The West Bengal Renewable Energy Development Agency, the nodal agency for promoting renewable energy and energy efficiency projects in the state, has recently been designated as the nodal agency for promoting CDM in the state.
 6. MOEF is working closely with international organizations on capacity building. United Nations Development Programme (UNDP), Asian Development Bank (ADB), and GTZ, German technical cooperation, support these programmes.

1.4 International Collaboration

- **The German Agency for Technical Cooperation (GTZ)**

The Indo German Energy Programme (Bureau of Energy Efficiency, Ministry of Power, Government of India) is implementing "A CDM - Capacity building

Programme" in partnership with Designated National Authority (Ministry of Environment and Forests, Government of India). The programme is funded by the German Ministry of Economic Cooperation and Development through IGEN, GTZ, for a period of three years to help reduce transaction cost in early market development process. The programme objective is to foster high quality CDM projects that will successfully complete the project cycle and provide experience through 'learning by doing'. These projects should be widely replicable. The aim of the project is capacity building and support to public and private sector institutions for preparation and implantation of internationally acceptable projects under the Clean Development Mechanism (CDM). GTZ support also includes helping the Indian DNA to prepare and launch a website.

- **The Asian Development Bank (ADB)**

The Asian Development Bank (ADB) supports climate change initiatives across its member developing countries in Asia and the Pacific through its Renewable Energy, Energy Efficiency and Climate Change (REACH) Programme. The Programme is supported by the trust funds from the Governments of the Netherlands, Denmark and Canada, and through the CDM Facility established in 2003. The Canadian Cooperation Fund on Climate Change under the REACH programme funded an 18-month Technical Assistance (TA) project in India (US\$ 700,000). The implementation of this TA is expected to start in June 2005. The main aspects of the ADB TA project include:

1. ADB would provide technical assistance for Capacity Building for Clean Development Mechanism (CDM) in India. While adopting a learning-by-doing approach, this TA project will target CDM opportunities available at selected urban local bodies, municipalities and rural sectors. It will mainstream CDM opportunities in the domestic financial sector and help structure a dedicated fund for facilitating widespread implementation of CDM projects in India.
2. The project would be implemented in close cooperation with the Ministry of Environment and Forests. It will address the capacity building needs of various stakeholders to strengthen India's position as a key player in the rapidly evolving international carbon markets.
3. The Project will provide broad-based institutional development, technical, and training support. The project shall build capacity of various stakeholders including urban local bodies in selected States for assessing, evaluating and developing potential CDM projects and project design documents (PDDs). It shall also develop a limited number of best practice CDM methodologies and PDDs, and formulate bundling mechanisms and financial structuring options. These activities has to be done in close cooperation with suitable banks and local bodies, in selected small-scale CDM sectors such as rural energy supply and SME industry clusters. These small-scale demonstration projects will form the base for the preparation of an operational toolkit/handbook. Other objectives of the project include targeted training to domestic financial

and insurance sector in the area of appraising and structuring CDM projects; and the development of a detailed feasibility design of a dedicated fund for facilitating widespread implementation of CDM activities in the country.

- **The United Nations Development Programme (UNDP)**

UNDP has been working closely with the Government of India in various strategic areas of development interventions. As one of the implementing agencies of the GEF, UNDP is contributing towards resource mobilization for addressing global environment issues. Clean Development Mechanism (CDM) is an important and innovative international financial cooperation mechanism that can play a significant role in mitigating climate change and promoting sustainable development in the long run. UNDP primarily seeks to contribute to an effort to mobilize and leverage additional CDM resources for an enhanced contribution to rural development and poverty alleviation.

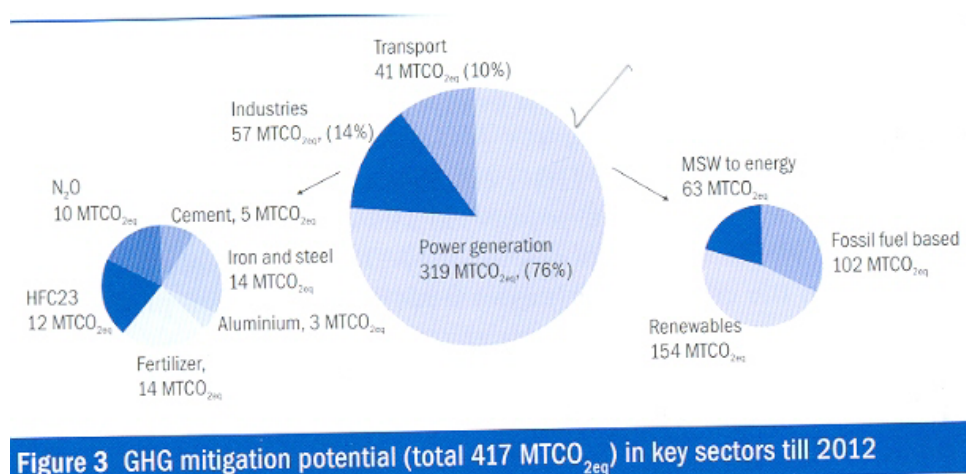
Five state agencies namely, 1- Punjab Energy Development Agency (PEDA), 2- Maharashtra Energy Development Agency (MEDA), 3- Rajasthan Energy Development Agency (REDA), 4- Environment Protection, Training & Research Institute (EPTRI), and 5- Environment Management & Policy Research Institute (EMPRI) have been identified with the Ministry of Environment & Forests for capacity building exercise. These agencies would each develop 2-3 Project Concept Notes and Project Design Documents with hands-on approach. If the project is successful, further agencies may be identified for capacity building in the second phase.

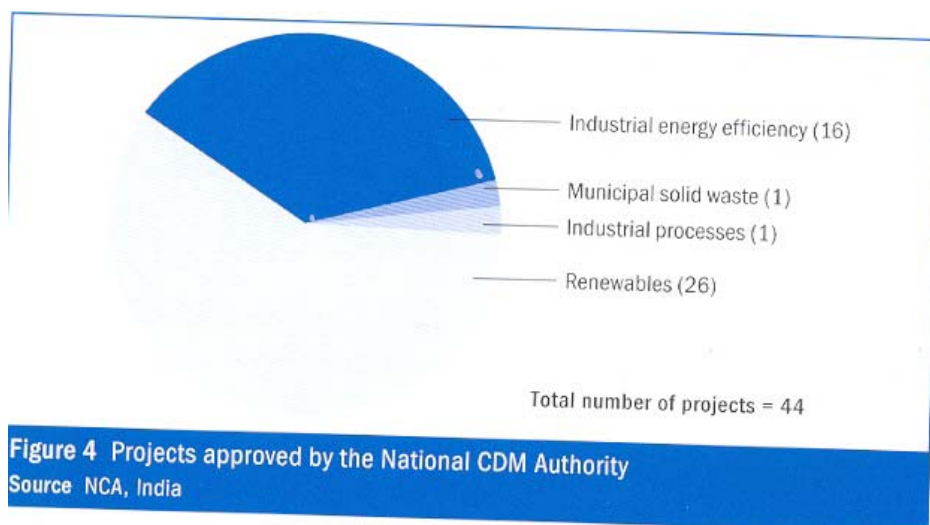
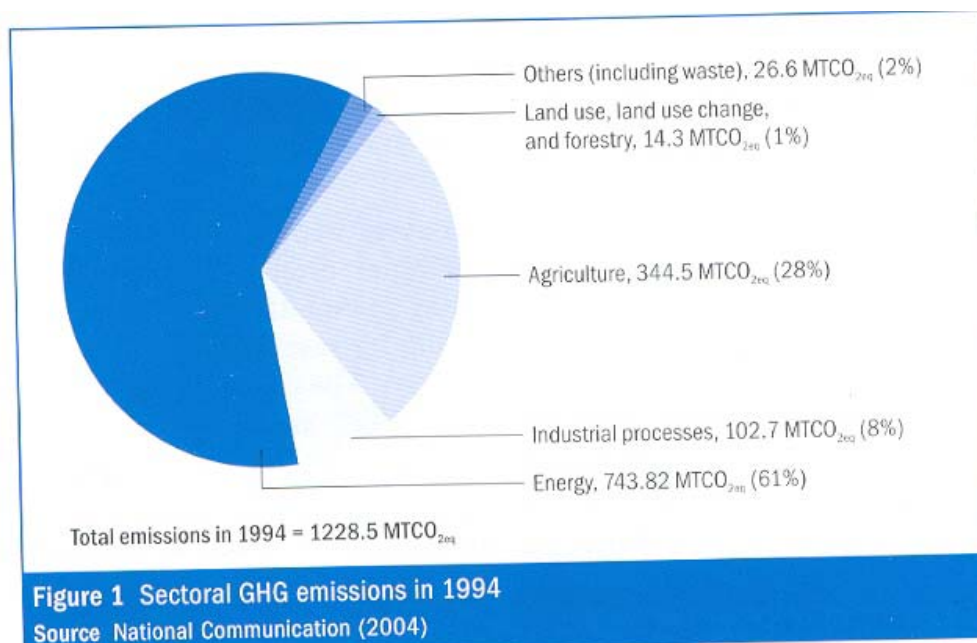
1.5 Recent Developments

1. The CDM Executive Board has approved simplified modalities for small-scale CDM projects. Further baseline and monitoring methodologies are in the process of being reviewed and approved by a Meth (methodology) Panel. The Meth Panel has developed and proposed consolidated methodologies and comprehensive additional tools to streamline the project approval process. As by 1 February 2005, 19 baseline and monitoring methodologies have been approved in the following sectors.
 - a. Energy generation and demand
 - b. Manufacturing industries
 - c. Fugitive emissions from fuels
 - d. Fugitive emissions from halocarbons
 - e. Waste handling and disposal
 - f. Agriculture
2. It is estimated that around 150 CDM project have been designed in India. Scores of project ideas are being discussed as potential CDM projects in various sectors now in India. CDM project development in India is facilitated largely by consultants and funded by the private sector itself. Some projects have also been

developed with the support of various donors for CDM capacity-building programmes in India or through CDM tenders. These donors include: Canada, Germany, Japan, United Kingdom, The World Bank, UNDP [United Nations Development Programme] India, the European Commission, etc. A number of financial institutions in India are currently operating a carbon funds. For instance, IDFC (Infrastructure Development Finance Corporation) is operating on behalf of the Prototype Carbon Fund. On the other hand, RaboBank India is operating for the Government of Netherlands. These financial institutions have recently included carbon revenues in their financial appraisals. Three DOEs (DNV, TUV SUD, and DGS) are represented in India.

- The current situation is described by the statistics illustrated in the figures below. The figures include information about the GHG mitigation potentials in key sectors till 2012, the sectoral GHG emissions in 1994, and the projects approved by the National CDM Authority.





1.6 Issues and concerns related to project preparation and approval

1. All the steps in the project cycle have associated costs, which contribute to the aggregation of transaction costs. In some cases, given the prevailing prices of CERs, these costs may not be offset by the CDM revenues. This may dampen the supply of projects. IDFC's experience reveals that the transaction costs today

- range between 65.000 and 250.000 UDD in India, and at a price of 5 UDS per CER, a threshold of 4.000 CERs need to be generated per year to break even.
2. Out of nineteen methodologies submitted from India, only two have been approved. This low success rate reflects the level of understanding and the quality of PDDs being prepared. It also highlights the need for improvement, and the scope of improvement in skills of consultants.
 3. Access to relevant and authentic data is the most crucial factor in developing a successful PDD. Despite that PDDs are prepared under a national strategy formulation, the access, availability, and authenticity of data were limited and inhibited the timely preparation of PDDs developed under the NSS.
 4. Limiting the bundling capacity of projects under SSC prohibits bundling a large number of SSC project. The limits specified under SSC M&P are: 15 MW [megawatt], 15 GWh [gigawatthour] or 15 thousand tones. This may result in several bundled projects of similar type and nature at one location. Such limitation will increase the transaction cost and is less attractive for the buyers. Therefore, it may be worth re-examining the upper limit for bundled SSC projects.

2 Basel Convention

2.1 Status of political acceptance

A. History:

- India signed the Basel Convention on March, 15 1990
- India Ratified it on March 24, 1992
- The convention came into force in 1992

B. In the late 1980s, a tightening of environmental regulations in industrialized countries led to a dramatic rise in the cost of hazardous waste disposal. Searching for cheaper ways to get rid of the wastes, “toxic traders” began shipping hazardous waste to developing countries and to Eastern Europe. When this activity was revealed, international outrage led to the drafting and adoption of the Basel Convention. The Basel Convention deals with the control of transboundary movement of hazardous wastes, particularly from industrialized countries to developing countries. Though the Basel Convention succeeded in limited hazardous waste exports, its effectiveness in protecting the environment through waste minimization remains low. Domestic and industrial waste production worldwide continues to rise in both absolute and per capital terms. Some projections expect waste production to increase five folds by 2025. Generation of waste is steeply growing both in newly industrialized and developing countries.

C. A central goal of the Basel Convention is “Environmentally Sound Management” (ESM). ESM aims to protect human health and the environment by minimizing hazardous waste production whenever possible. ESM addresses the issue of minimizing hazardous waste production through an “integrated life-cycle approach”. The “integrated life-cycle approach involves strong control over the whole process of hazardous waste management: generation, storage, transport, treatment, reuse, recycling, recovery and final disposal. Many companies have already demonstrated that “cleaner production” approach, which eliminate or reduce hazardous outputs, can be both economically and environmentally efficient. The United Nations Environment Programme’s (UNEP) Division on Technology, Industry and Economics works to identify and disseminate “best practices” for cleaner production.

D. There is a general censes in India, both at the political and bureaucratic level that transboundary imports of hazardous waste materials should be controled. The death of 12 people due to the explosion of imported scrap materials increased the awareness of the danger of hazardeous wastes.

2.2 Legal and administrative Framework

A. The Union Ministry of Environment and Forests is the nodal agency dealing with the Basel Convention. It drafts pilots, bills, orders and notifications related to the convention. Some of the Ministry’s sub-ordinate body, i.e., Central Pollution Control Board and state level pollution boards, are responsible for the monitoring.

Most of the action points discussed in the Basel Convention have already been adopted and harmonized with the country laws.

- B. Hazardous waste management rules existed in India since as early as 1989. These rules have been amended a number of times to make them in agreement with the Basel Convention.
- C. India has banned import of 18-19 class of compounds that appear in Schedule 8 of the convention. The import of Lead acid from battery wastes is also banned. The import of non-metallic wastes containing arsenic and lead beyond 0.1 per cent has stringent conditions and is not allowed under Open General License of import. The import of waste and used oil is also prohibited.
- D. At the beginning of the application of the convention there were widespread protests from importers of chlor-alkali and lead batteries against the banning of the import of these materials. Now this objection has subsided and industry is more or less in agreement with the regulation. Another factor is the interest that the Supreme Court, the highest judicial body in the country, has shown in hazardous waste management. In its 2003 ruling on public interest litigation, the court directed the government to meet certain targets. Some of these targets directly or indirectly deal with monitoring and controlling of hazardous waste import into the country. The court also appointed a high-level committee of experts to monitor the actions taken by the government and report back to the court. The committee has been visiting various states since then to check randomly on the initiatives taken by the State PCBs.
 - a) The government of India amended the existing 1989 Hazardous Waste Managing and Handling Act in 2003. [See Annex-1 for the complete details)
 - b) The state pollution control boards have been monitoring inflow and management of hazardous wastes into every state. The SPCBs register the firms dealing with recycling of hazardous wastes in each state, and periodically send a list of such firms to CPCB, which is under the Union Ministry of Environment and Forests.
 - c) Civil Society movements: Many NGO's are active in the monitoring of the inflow of hazardous wastes that fall under the Basel Convention into the country. The New Delhi-based Toxics Link is one of the most active of these NGOs. Toxics Link also monitors the activities of the firms that recycle or deal with hazardous wastes in the country. From time to time, it publishes publications or reports on its Web site www.toxicslink.org .
 - i. A recent example of a report by Toxics Link is based on a survey published by the British Environment Agency: "Britain's Environment Agency Confirms Huge E-waste Outflow to India". The report is available at: <http://toxicslink.org/art-view.php?id=75>.

A code of the report says: “ E-waste is a hazardous waste; as per the Basel Convention as it contains several toxics like heavy metals, PVC plastics, brominated flame-retardants, etc, which are a hazard to environment and human health”.

- ii. Another report from Toxics Links deals with lead acid batteries. The report states the following: lead acid batteries are a by-product of the automobile industry and those batteries are recycled for lead all over the world. In India, lead acid batteries recycling are not an organized industrial process, and are generally carried out on a backward level. This recycling results in massive lead pollution and has a huge impact on the environment and health. Lead is a highly toxic heavy metal that occurs naturally in the environment and has many industrial uses. However, even small amounts of lead can be hazardous to human health. Short-term exposure to high levels of lead can cause vomiting, diarrhoea, convulsions, coma or even death. Even small amounts of lead can be harmful, especially to infants, young children and pregnant women. In the developed countries recycling of lead acid batteries according to the norm is a costlier operation as a consequence a large number of batteries are dumped or recycled in developing countries such as India. The battery Rules, to improve the battery collection and recycling system, were published in 2000. However a study done by Toxics Link in Delhi showed a depressing picture of lead acid battery recycling in the capital. Toxics Link is also planning another study on the ground situation of battery disposal after the notification of the new Rules. This study will focus also on the responsibility of battery producers to arrange collection of used batteries and recycle the product through authorised recyclers. Toxics Link’s presentation gave an update on battery laws with ground perspectives related to lead acid batteries rules, that is, The Batteries (Management and Handling) Rules, 2001. The Rules apply to every manufacturer, importer, re-conditioner, assembler, dealer, recycler, auctioneer, consumer and bulk consumer involved in the manufacture, processing, sale, purchase and use of lead acid batteries or components of such batteries. They are aimed at the safe management of the hazardous effects of lead and control of pollution.
- iii. According to Toxics Link:
 1. Only 11 states filed compliance reports.
 2. The level of collection of used-batteries by big manufacturers still does not meet the law requirements.
 3. No information is available on the compliance level in the public domain.
 4. Large amounts of batteries are ending up with unregistered recyclers.
 5. Compliance level among dealers is very low.
 6. Visibility of the Rules is still very low.

2.3 National Initiatives

- A. India has taken numerous steps in the direction of scientific management of hazardous wastes. It has modified its domestic legislations for the handling and disposal of hazardous wastes way back in 1989, the same year when the World community adopted the Basel Convention. Since then, India has further amended its strategies and national programmes to make them more allied with the Basel Convention. In the past decade and a half, India has taken specific actions to further tighten the Rules for management of wastes, fix institutional responsibilities, and enhance resources for waste disposal. In addition, India has taken actions to lay down standards for treating effluents, and guidelines for construction and operation of secured landfills. Some of the major programmes include:
- Enactment of specific legislations to effectively deal with special categories of Hazardous Wastes viz. Bio-Medical Wastes and Lead Acid battery wastes.
 - Establishment of state-of-the-art Common Treatment, Storage and Disposal facilities for industrial hazardous wastes and biomedical wastes under the public-private partnership initiatives. Already 5 Hazardous Wastes Treatment, Storage and Disposal facilities and more than 70 Bio Medical Facilities have been set up in different States.
 - Harmonization of Import/Export policies for hazardous wastes with the principles of Basel Convention.
 - Synchronization of Domestic Foreign Trade and Customs Legislations with Hazardous Wastes Rules. In addition, capacity building at major ports and Customs Laboratories to prevent illegal import and dumping of Hazardous wastes in the country. For instance, for the ease of monitoring the inflow of hazardous waste into the country, an international coding system is used: a hazardous material will have the same code as it has in any other country that adopts the Basel Convention.
 - Formulation of comprehensive technical guidelines to facilitate the industries, particularly small- scale industries, to deal with hazardous waste management.
- B. India has identified priority programme activities for preventing, minimizing, recycling, recovering and disposing of hazardous and other wastes in an environmentally sound manner and for promoting capacity building and adoption of cleaner technologies. There are still significant challenges with regard to technology upgrading. A major challenge is the resource constraint faced by the small and medium scale industries with regards to both waste minimization and treatment technologies.
- C. The government of India maintains a list of industrial units that deal with hazardous wastes, including those, which import non-ferrous material wastes for

recycling. The list, including some details about these firms, is available on the MoEF website. Similarly, Rule 5 of the Batteries (Management and Handling) Rules, notified by the Ministry of Environment and Forests in May 2001, stipulates that all the importers of new lead batteries must register with the Ministry of Environment and Forests by submitting details in a form prescribed in the Rules. Rule 6 stipulates that custom clearance of imported lead acid batteries shall be contingent upon, inter-alia, the one time registration with the Ministry of Environment and Forests. Accordingly, applications are being received from importers of new lead acid batteries. Based on the examination of the applications, one time registration is being granted to such importers. As on March 1, 2005, there are about 64 firms have registered with MoEF. Similarly, MoEF maintains a list of other non-ferrous metal waste re-processors. There are about 81 firms registered as non-ferrous recyclers in the country. In addition, there are 35 waste oil/used oil-recycling firms that have received permission from the MoEF.

- D. The situation improved considerably due to the Supreme Court closely monitoring of hazardous waste management.. An empowered monitoring committee appointed by the apex Court frequently visits various states, get firsthand information, and submit reports to the Court. The committee, which was set up immediately after the October 2003 Supreme Court Order on hazardous waste management in the country, has examined hazardous waste management preparedness of almost all Indian states.
- E. There is a slowly growing resistance from the local communities against dumping hazardous wastes in their vicinities as the awareness of the harmful effects of these wastes increases. This resistance is illustrated mainly by the NIMBY attitude, i.e. 'Not in My Backyard.'

2.4 Example of Government Enforcement of Cleaner Production

The regulation of the waste oil/used oil recycling is an example of the application of the cleaner production concept in India. Before the Indian government engagement to enforce cleaner production processes, most of the re-refining units in the small-scale sector in India used to adopt the acid-clay process to recycle used oil. This classical process used to be the basic method all over the world. It has the disadvantage of generating large quantities of hazardous and toxic acid sludge and clay contaminated with oil and heavy metals. Being a non-environment friendly method, the acid-clay process has been abandoned some years ago in most countries including the USA, the European Union countries, and other industrially advanced countries. The sludge resulting from this process contains a significant amount of oil and has fuel value. It is presently used in India as a fuel, e.g. in brick manufacturing units. The acid sludge is being burned in brick kilns that are not properly equipped with air pollution control devices. Though this is a reuse of a resource, it generates hazardous gaseous emissions and creates environmental problems. To solve this issue, in 1997, the CPCB issued a direction to the SPCBs to disallow the acid-clay process. In 2000, the government amended its first decision and allowed the modified acid-clay process.

The Hazardous Waste (Management & Handling) Amendment Rules, 2003 details the technology and standards regarding re-refining and recycling. These rules states that:

- I. Re-refiners and recyclers shall use only environmentally sound technologies when recycling and re-refining non-ferrous metal wastes or used oil or waste oil. In case of used oil, re-refiners using acid clay process or modified acid clay process shall switch over within six months from the date of commencement of the Hazardous Waste (Management & Handling) Amendment Rules, 2003 to other environmentally sound technologies as under:
 - a. Vacuum distillation with clay treatment.
 - b. Vacuum distillation with hydro treating.
 - c. Thin film evaporation process; or
 - d. Any other technology approved by the Ministry of Environment & Forests
- II. The re-refiners and recyclers, registered with the Ministry of Environment and Forests or the Central Pollution Control Board in accordance with the procedure laid down in rule 19, shall file a compliance report of having adopted one of the technologies mentioned in sub-rule (1) within six months from the date of commencement of the Hazardous Wastes (Management and Handling) Amendment Rules, 2003.
- III. Notwithstanding anything contained in a certificate of registration granted to a recycler or re-refiner, such registration with the Ministry of Environment and Forests shall cease to be valid if he fails to comply with sub-rule (1).
- IV. The State Pollution Control Board or Committee shall inspect the re-refining and recycling units within three months of the expiry of the six months period referred to in sub-rule (1), and submit a compliance report to the Central Pollution Control Board which shall compile such information and furnish the same to the Ministry of Environment and Forests on a regular basis.
- V. The Ministry of Environment and Forests shall notify from time-to-time specifications and standards to be followed by recyclers and re-refiners.

3 Stockholm Convention

3.1 Status of political acceptance

A. Legal Status:

- India signed the treaty on 14 May 2002
- India hasn't ratified the treaty yet. is not However, the government of India has decided in principal to ratify the PoPs Treaty. A Cabinet note is ready. The ratification will happen once the Union Cabinet gives the nod (this is expected anytime now).
- The Convention came into force on May 17, 2004.

B. Current Situation:

- The convention focuses on reducing and eliminating the release of 12 of the most dangerous Persistent Organic Pollutants (POPs). Coined as the "Dirty Dozen" by the United Nations Environment Programme (UNEP), POPs include: eight pesticides (aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex, and toxaphene); two industrial chemicals (polychlorinated biphenyls (PCBs), and hexachlorobenzene); and two unintended by-products (furans and dioxins).
- Ratification is expected within a short time with the imminent approval of the Rs 1,25,000 crore Indian chemical industry. India is expected to avail the Article 25 (4) of the convention. This article gives discretionary powers to Parties with regard to future amendments to Annex A, B or C. This gives India a chance to "opt in" or "opt out" of any ban imposed on new chemicals.
- According to the Government of India, out of 12 POPS chemicals, six (aldrin, chlordane, endrin, heptachlor, toxaprene, hexachlorobenzene) are already banned in India. In addition, 2 of the 12 POPS (DDT and dieldrin) are under restricted use. Pesticide Mirex is not registered in India, and polychlorinated biphenyls are not produced in the country. Dioxins and Furans are unintended by-products.

Chemical	Status	Effective Date
Aldrin	Complete ban on manufacture, use, import and export	20 th September 1996
DDT	Banned for agricultural use, and restricted use in public health sector (10,000 MT per annum)	26 th may 1989

Dieldrin	<p>a) Use restricted to locust control in desert areas under the direction of Plant Protection Adviser.</p> <p>b) Complete ban on manufacture, import and export.</p> <ul style="list-style-type: none"> Marketing and use permitted for two years from the date of ban on manufacture, or date of expiry, whichever is earlier. 	<p>a) 15th May 1990</p> <p>b) 17th July 2001</p>
Endrin	a) Complete ban on manufacture, use, import and export	15th May 1990
Chlordane	a) Complete ban on manufacture, use, import and export	20th September 1996
Mirex	Never registered	
Toxaphene	Complete ban on manufacture, use, import and export	25th July 1989
Heptachlor	Complete ban on manufacture, use, import and export	20th September 1996
Hexachlorobenzene	Complete ban on manufacture, use, import and export	

3.2 Legal / administrative framework

- A. The Union Ministry of Environment and Forests is the nodal agency for the programme. The Ministry's declares that out of 12 POPs chemicals, six (aldrin, chlordane, endrin, heptachlor, toxaprene, hexachlorobenzene) are already banned in India. In addition, 2 of the 12 POPs (DDT and dieldrin) are under restricted use. Pesticide Mirex is not registered in India, and polychlorinated biphenyls are not produced in the country. Dioxins and Furans are unintended by-products..
- B. The ministry has assigned the Lucknow-based Industrial Toxicological Research Institute (ITRC) to conduct a preliminary assessment to identify the requirements for developing a National Implementation Plan in India. ITRC has already submitted a draft plan to the Ministry. Once the Union Cabinet gives the green light to ratify the convention, the Ministry intends to start up a detailed study to estimate stockpiles of different pesticides, banned or suspected, in the country. The project might be supported by GEF/UNIDO. This study is expected to be the forerunner of the National Implementation Plan, which may be implemented much later.
- C. Status of POPs in India: Out of the 12 POPs, six have been banned in India. Thus, India has already taken germane actions in accordance with Stockholm Convention. The progress in banning these chemicals is provided in the table that follows.

PCBs:**A. Regulations and Enforcements.**

- PCBs have been banned in India since 1967.
- According to MoEF officials, BHEL (the only firm that manufactured transformers which contain PCBs) had submitted the statement to the government declaring that it had stopped PCB's production already in 1963.
- In 1967, the Ministry of Petroleum and Natural Gas passed a law banning PCBs in transformers capacitors. The government reports that PCBs have not been used in the country since 1967.
- The Hazardous Wastes (Managing and Handling) Amendments Rules, 2000, list PCBs as a Class A waste substance and specify for it a limit on concentration level of 50 mg/kg. The first activity of the NIP is to identify such potential sources of PCB contamination.

B. PCBs Potential Presence in India.

- MOEF states that no company in India has ever produced paints containing PCBs, paints being recognised as another potential class of products that may contain PCBs.
- There is low chances that PCB's are disseminated by the ship demolishing industry the when ships are scrapped. As the use of PCBs in paint was banned world wide more than a decade ago, demolished ships are not expected to have PCB's considering that a ship receives a fresh coat of paint every two years. However in a study on ship demolishing (Hess R Rushworth, D Hynes & Peters J E: *Disposal options for ships* (www.rand.org/publications/MR/MR1377/MR1377.ch4.pdf)), the authors estimated that a typical merchant ship to be dismantled for scrap contains 250 kgs to 800 kgs of PCBs, found principally in the paint, and the machinery.
- A 1996 World Bank study, Management of PCBs – India, estimated that approximately 2,000 to 4,000 tonnes of PCBs existed in India. The amount of power PCB-containing transformer oil was estimated to be in the range of 3,000 to 5,000 tonnes, with the amount of PCBs in capacitors estimated to be 1,000 tonnes. The authors assumed that there is an equivalent amount of PCBs outside the power sector, including hydraulic systems of heavy machinery and paints. The steel industry is a likely source of PCBs, particularly the plants using Russian technology.
- In World Bank's opinion, PCBs are not considered a priority in India. The general feeling is that PCBs are not a problem because they have been banned since 1967, are not produced in India, and their import is no longer permitted. Yet a number of outstanding issues remain to be addressed: 1) awareness raising, 2) analytical facilities, 3) inventories, 4) storage and disposal technologies and 5) PCB management plans in the power sector and some other sectors.

DDT:

- Only one public sector firm HIL is producing DDT in the country.
- The total volume of DDT produced per year is 4500 MT. MOEF officials feel that, it is very small quantity considering the size of the country, and that India still has time till 2025 to completely phase out the use of DDT.
- It appears that there are no effective alternatives readily available to replace DDT use. As an example, South Africa had to resume using DDT after it banned its use because the alternatives had proved ineffective. When an efficient alternative can be identified, the government would take a new look at the DDT policy.

Dioxins:

- Dioxins are by-products.
- NIPs main aim is to monitor Dioxins production along with looking for PCB stockpiles. There are 8 to 10 laboratories in the country, which have the capacity to monitor and measure PCB/dioxin production. These labs include National Environmental Engineering Research Institute, Nagpur, National Chemical Laboratory, ITRC, Shriram Centre, Regional Research laboratory, Thiruvananthapuram, National Institute of Occupational Health, Ahmedabad, and etc.
- Currently, no data is available how much dioxins are produced in the country.
- India currently has limited capacity to measure or monitor dioxins and furans. In addition, its ability to monitor unintentionally produced PCBs is also limited. The CPCB is working very closely with the German technical aid agency GTZ to develop monitoring systems.
- India does not require reporting of dioxins or furans or dioxin-like PCBs release to the environment. Environmentalists agree that dioxins are being produced throughout India, but the magnitude of health and environmental levels and effects of dioxins and furans is unknown.
- According to ITRC, major sources of dioxins and furans in India are:
 - A. Combustion processes
 1. Waste incineration
 2. Open field/landfill burning
 3. Residential combustion
 4. Fossil fuel combustion
 5. Wood firing installations
 6. Thermal processes
 - B. Industrial processes:
 1. Thermal processes in metallurgical industry
 2. Pulp bleaching by chlorine
 3. Textile/leather dyeing (with chloranil)
 4. Smouldering of copper cables
 5. Additives in petrol and lubricants
 - C. Production of Specific chemicals
 1. 2,4,5-Trichlorophenol (TCP)
 2. Pentachlorophenol
 3. Chloranil
 4. Chlorinated aromatics
 5. Vinyl chloride

3.3 National initiatives

- A. According to MoEF officials, Indian chemical industry is well aware of the issues and cooperates sincerely with the government. MoEF is hopeful that once the convention is ratified, many industries will take up programmes to tackle the issue of dioxin/furan emissions. Industry organizations, such as Indian Chemical Manufacturer's Association (ICMA), and NGOs, such as Toxics Link and Greenpeace India, are participating in the discussion..

- B. The Rs 1,25,000 crore Indian chemical industry initially had a lot of reservations about India signing the convention. Although they have nothing against the existing list of POPs, they fear that slowly other chemicals will be added to the list and that this may hamper their operations. However, the government of India, which had several rounds of discussions with the industry, has assured them that India will then utilise Article 25 (4) of the convention, which gives discretionary powers to Parties with regard to future amendments to Annex A, B or C. This gives India a chance to “opt in” or “opt out” of any ban imposed on new chemicals. Out of 94 countries that have so far ratified the convention (until March 15 2005), only nine have opted for conditional ratification. These countries include Argentina, Canada and China. ICMA is a regular member of the India’s official delegation to the POPs Convention and participates actively in the discussions.
- C. Both Toxics Link and Greenpeace are quite outspoken regarding the fact that India has not ratified yet the convention. According to a Toxics Link publication, Status of POPs in South Asia, “There is very little awareness on the release of dioxins and furans in the region. Given the fact that the dioxin releasing industries in India use outdated technology with high inefficiencies, it is expected that the dioxin and furan releases will be considerable. The main shortcomings seem to be the lack of monitoring facilities and lack of knowledge of the nature of possible dioxin exposure.” Toxics Link acts as a pressure group and is also an invited NGO to the convention.
- D. The MoEF has been regularly interacting with chemical industry. The Central Pollution Control Board (CPCB) in joint cooperation with GTZ is working on monitoring systems for dioxin/furan for various industrial units. As part of preparing a draft proposal for NIP, in the 2004 calendar year, ITRC conducted as many as 10 workshops in different parts of the country to educate various stakeholders about POPs in general and the Stockholm convention in particular. Apart from industry, state government officials, representatives of farmers and health workers and researchers participated in these workshops. The broad objectives of these workshops included gathering information on infrastructure of government institutions, commerce and industry, public and private testing laboratories, research institutions, enforcement entities, public health institutes, NGOs and other associations relevant to the implementation of the Stockholm convention. More concrete actions are expected only after the ratification and NIP is adopted.
- E. Integrated pest management: The government of India has programmes to explore alternative pest control methods, including Integrated Pest Management (IPM), which promotes an environmentally sound and sustainable strategy of pest control. The concept was adopted in 1990, when subsidies on pesticides were stopped and money diverted to IPM. The National Centre for Integrated Pest Management (NCIPM) and agricultural universities carry out research and encourage alternative methods.
- F. Through IPM, farmers can learn how agricultural eco-systems function, including how pest populations change. Farmers learn to ecologically and economically manage pests, including how to physically remove and destroy pests, build up beneficial predators and diversify crops. The aim is to keep the balance between pests and their natural enemies, and to keep the spraying of

expensive and potentially damaging and dangerous pesticides to an absolute minimum. However, IPM has yet to gain wide application in India. Although the Indian government provides assistance to farmers during the transition period when IPM affects the crop yield and farmers' income, farmers are reluctant to adopt IPM. The reason is that IPM is a slow process and has an initial high cost of implementation.

3.4 National institutions and Capacity Building

India has a number of excellent chemical science laboratories. These laboratories are mainly operated by the public sector, have sophisticated facilities, and the capability of detecting and monitoring dioxins and furans. Dioxins and furans are both by-products categorized as POPs.. MoEF has particularly identified 10 laboratories in different parts of the country for this purpose. Central Pollution Control Board is already working with international organizations like GTZ for capacity building in monitoring dioxin emission from different industries such as paper and pulp, cement, iron and steel sintering process in the metallurgical industry, etc.

3.5 Issues and concerns

- A. As there are currently no norms regarding dioxin and furan emission control, it is not yet legally binding on industry to curb such emissions. However, things are expected to be different after India ratifies the POPs convention and the NIP is accepted.
- B. Currently, India does not have a dioxin or furan inventory. These two industrial POPs are unwanted by-products resulting from industrial and thermal processes. As a result, unlike intentionally produced substances, the ban is not an effective measure to address the problem of dioxin and furan releases. Cleaner Production can be a potential partial remedy. There are several provisions in the Convention that are related to the CP concept: safer alternatives, life cycle thinking, Best Available Technique, Best Environmental Practices, prevention-oriented national policies and plans.
- C. Two potential alternatives to the ban of dioxins and furans exist. The two alternatives are:
 1. Opt for conventional end-of-pipe. This requires considerable expenditure on abatement and monitoring equipment; or
 2. Focus efforts on preventative strategies and search for alternatives production processes that reduce and/or eliminate the dioxin/furans emissions. .
- D. Some valid observations from the 2002 World Bank-sponsored study [Status Report on Stockholm POPs in India, Resource Futures International, 2002] are listed as follow:
 - The illegal products are of questionable standard and efficacy, and often sold in unlabelled packets or boxes. Many small-scale industries produce pesticides; and thus the technical formulations and grade cannot always be determined. The poor labelling and lack of standardized production can lead

to incorrect application and overuse of banned substances, ignorance of the hazards involved, lack of safety considerations and improper use of equipment and protective clothing. The risk of acute pesticide poisoning following accidental or intentional overexposure is extremely high.

- The FAO has undertaken an inventory on stockpiles of pesticides in India. This study indicated that the total of obsolete, unwanted and/or banned stocks in India totals 3,346 tonnes (both POPS and non-POPs). The FAO reckons this figure is far lower than actual stockpiles. The inventory lists two known sites of BHC (980 and 700 kg) and one known site of DDT (150 kg). There is a number of organochlorine stockpiles listed, where the common name, commercial name, and formulation are unknown. Included in the inventory are 1,464,481 kg of organochlorine stocks (location, name, formulation unknown) declared by the Indian government at the UNEP-Chemicals workshop at Bangkok. The MP PCB indicated that it was approached by the state office of the National Anti-Malarial Programme (NAMP) to provide assistance in the disposal of stockpiles of an estimated 500 to 600 tonnes of DDT.
- There are no policies or technical guidelines in India regarding the disposal of stockpiles. However, an Experts Group constituted by the Ministry of Agriculture has recommended incineration in an appropriate manner with the help of emission control equipment. Those pesticides that cannot be disposed off through incineration may be disposed of in secure landfills. The CPCB and SPCBs are responsible for monitoring the disposal process, and the state departments of agriculture are responsible for developing programmes for disposing of stockpiles.
- The government has experienced problems with the disposal of banned pesticides, lacking of technology and know-how for proper disposal of stockpiles. To overcome these problems, the strategy of the government is to allow the use of the pesticide for two years from the day of notification of the ban. This strategy will allow the existing stocks to be used up, eliminating the need for disposal, as safe and effective disposal technologies are lacking in India. The banned pesticides will continue to be used on recommended crops; the state governments will monitor their usage. State governments are expected to develop action plans for disposal within one year of the Indian legislative ban, the period of destruction and disposal should not exceed three years.
- Similarly, abandoned factories and storage warehouses in India can contain banned POPs, and are sources of potential releases of POPs into the environment through seepage, vaporisation and leaching. As pesticides deteriorate, they form by-products that may be more toxic than the original substance. In addition to pesticides, waste sites often contain contaminated sprayers, empty pesticide containers, and polluted soil. FAO reports that in many cases the stockpiles have been abandoned and pesticide was left in the open or stored in corroding metal containers.
- The stockpiles of banned and date-expired POPs are considered hazardous waste. Their removal and destruction is expensive and requires technical expertise. The cost of disposal is estimated around US\$ 3 per kilogram or litre.